

表-2 プロジェクト施設の主要諸元 (1/2)

1. Lawati Diversion Weir and Diversion Canal	
1.1 Lawati diversion weir	
(1) Catchment area	: 41 km ²
(2) Design discharge	: 56 m ³ /sec
(3) Weir type	: Fixed overflow type concrete weir
(4) Weir height x crest length	: 2.3 m x 16.0 m
1.2 Lawati diversion canal	
(1) Canal type	: Trapezoidal concrete lined canal
(2) Design discharge	: 3.0 m ³ /sec
(3) Canal length	: 2.7 km
(4) Related structure	
a) Chute	: 1 nos.
b) Drop	: 3 nos.
c) Culvert	: 3 nos.
2. Boloti Reservoir	
2.1 Boloti dam	
(1) Catchment area	: 14 km ²
(2) Effective storage capacity	: 7,500,000 m ³
(3) Dead water capacity	: 600,000 m ³
(4) Maximum dam height x crest length	: 7.8 x 2,450 m
(5) High water level	: 1,078.0 m
(6) Low water level	: 1,072.6 m
(7) Crest elevation	: 1,080.4 m
2.2 Spillway	
(1) Spillway type	: Ungated overflow concrete type
(2) Design flood discharge	: 4.6 m ³ /sec
(3) Crest length	: 10.0 m
2.3 Outlet works	: 2 nos.
2.4 Outlet Canal	
(1) Canal type	: Trapezoidal concrete lined canal
(2) Design discharge	: 0.7 m ³ /sec
(3) Canal length	: 1.4 km
(4) Related structure	
a) Chute	: 2 nos.
b) Drop	: 2 nos.
c) Culvert	: 4 nos.
3. Sanya Irrigation System	
3.1 Sanya Chini intake weir (Rehabilitation)	
(1) Design discharge	: 170 m ³ /sec
(2) Weir type	: Fixed concrete weir
(3) Weir height x crest length	: 1.6 m x 26.9 m

表-2 プロジェクト施設の主要諸元 (2/2)

3.2 Headreach and main canal	
(1) Canal type	: Trapezoidal concrete lined canal
(2) Design discharge	: 1.05 - 0.17 m ³ /sec
(3) Canal length	: 13.9 km
(4) Related structure	
a) Siphon	: 1 nos.
b) Drop	: 42 nos.
c) Culvert	: 10 nos.
d) Check	: 15 nos.
e) Turnout	: 21 nos.
f) Spillway	: 4 nos.
3.3 Secondary canal	
(1) Canal type	: Trapezoidal concrete lined canal
(2) Design discharge	: 0.207 - 0.054 m ³ /sec
(3) Canal length	: 7.6 km
(4) Related structure	
a) Drop	: 23 nos.
b) Culvert	: 5 nos.
c) Check	: 8 nos.
d) Turnout	: 19 nos.
3.4 Tubewell (12 nos.)	
(1) Design discharge	: 50 lit/sec on an average
(2) Depth of tubewell	: 70 m on an average
(3) Head	: 10.1 - 30.5 m (20 m on an average)
(4) Pump type	: Submersible
(5) Motor output	: 30 kW
3.5 Night storage pond (32 nos.)	
(1) Effective capacity	: 1,740 - 340 m ³
3.6 Drainage canal	
(1) Canal type	: Trapezoidal unlined canal
(2) Design discharge	: 1.65 - 0.23 m ³ /sec
(3) Canal length	: 18.1 km
(4) Related structure	
a) Drop	: 22 nos.
b) Culvert	: 7 nos.
4. Road Network	
4.1 Length x width	: 38.0 km x 6 m
4.2 Pavement	: Marrum pavement
4.3 Related structure (Causeway)	: 3 nos.
5. Flood Dike	
5.1 Length	: 2.0 km
5.2 Crest width	: 3.0 m

表-3 工事に必要な建設機械

Equipment	Specification	Required Number
1. Bulldozer	32 ton	3
2. Bulldozer	21 ton	3
3. Bulldozer with ripper	21 ton	2
4. Bulldozer	15 ton	4
5. Backhoe	0.7 m ³	4
6. Backhoe	0.4 m ³	3
7. Wheel loader	1.7 m ³	2
8. Dozer shovel	1.2 m ³	3
9. Motor grader	3.1 m	2
10. Tamping roller	15 ton	1
11. Vibration roller	10 ton	1
12. Vibration roller	2.5 ton	1
13. Road roller	10 ton	1
14. Tire roller	8 ton	2
15. Dump truck	11 ton	7
16. Dump truck	8 ton	5
17. Fork lift	3 ton	1
18. Water tanker	6 klit	3
19. Tamper	80 kg	6
20. Hydraulic breaker (attachment for backhoe)	400 kg	1
21. Butcher plant	15 m ³ /hr	1
22. Crashing plant	20 ton/hr	1
23. Sand washing plant	10 ton/hr	1
24. Lining block plant	1,000 nos/day	1
25. Concrete mixer	0.4 m ³ /hr	2
26. Mortar mixer	0.08 m ³	1
27. Concrete vibrator	38 mm	4
28. Agitator truck	1.6 m ³	3
29. Truck crane	25 ton	1
30. Truck with crane	4/2.9 ton	3
31. Ordinary truck	4 ton	5
32. Trailer	32 ton	1
33. Fuel tanker	4 klit	2
34. Micro bus	25 person	2
35. Jeep	4 WD	10
36. Maintenance car	6 ton	1
37. Air compressor	15 m ³ /min	1
38. Air compressor	2 m ³ /min	1
39. Generator	175 kVA	1
40. Welding machine	11.2 kW	1
41. Submersible pump	50 mm	3
42. Truck mounted drilling machine		1
43. Testing and survey equipment	lot	1
44. Repair shop equipment	lot	1

表一-4 年次別投資計画

(Unit: 1,000 Tsh.)

Work Item	Investment			1st Year			2nd Year			3rd Year		
	LC	FC	Total	LC	FC	Total	LC	FC	Total	LC	FC	Total
I. PROJECT COST												
Phase-1												
1. Preparatory Work	9,130	43,310	52,440	-	-	-	9,130	43,310	52,440	-	-	-
2. Boloti Reservoir	80,070	562,540	642,610	-	-	-	80,070	562,540	642,610	-	-	-
3. Sanya Chimi Irrigation System	71,400	256,050	327,450	-	-	-	71,400	256,050	327,450	-	-	-
4. Office and Quarter	30,900	47,500	78,400	-	-	-	30,900	47,500	78,400	-	-	-
5. O & M Equipment	-	46,200	46,200	-	-	-	-	46,200	46,200	-	-	-
6. Administration Expenses	3,200	-	3,200	1,800	-	1,800	1,400	-	1,400	-	-	-
7. Engineering Services	-	157,100	157,100	-	79,500	79,500	-	77,600	77,600	-	-	-
Sub-total	194,700	1,112,700	1,307,400	1,800	79,500	81,300	192,900	1,033,200	1,226,100	-	-	-
8. Physical Contingency	19,300	111,300	130,600	200	8,000	8,200	19,100	103,300	122,400	-	-	-
Sub-total	214,000	1,224,000	1,438,000	2,000	87,500	89,500	212,000	1,136,500	1,348,500	-	-	-
9. Price Contingency	147,000	121,000	268,000	600	4,400	5,000	146,400	116,600	263,000	-	-	-
Total	361,000	1,345,000	1,706,000	2,600	91,900	94,500	358,400	1,253,100	1,611,500	-	-	-
Phase-2												
1. Preparatory Work	4,140	50,600	54,740	-	-	-	-	-	-	4,140	50,600	54,740
2. Tubewell, 12 Nos.-+3 Nos.	13,140	326,700	339,840	-	-	-	-	-	-	13,140	326,700	339,840
3. Sanya Chimi Irrigation System	68,620	283,000	351,620	-	-	-	-	-	-	68,620	283,000	351,620
4. Office and Quarter	1,800	3,000	4,800	-	-	-	-	-	-	1,800	3,000	4,800
5. O & M Equipment	-	46,200	46,200	-	-	-	-	-	-	-	46,200	46,200
6. Administration Expenses	3,200	-	3,200	-	-	-	1,800	-	1,800	-	-	1,400
7. Engineering Services	-	117,300	117,300	-	-	-	-	39,700	39,700	-	-	77,600
Sub-total	90,900	806,800	897,700	-	-	-	1,800	39,700	41,500	89,100	767,100	856,200
8. Physical Contingency	9,100	81,200	90,300	-	-	-	-	200	4,200	8,900	8,900	86,100
Sub-total	100,000	888,000	988,000	-	-	-	2,000	43,700	45,700	98,000	844,300	942,300
9. Price Contingency	119,000	138,000	257,000	-	-	-	1,400	4,500	5,900	117,600	133,500	251,100
Total	219,000	1,026,000	1,245,000	-	-	-	3,400	45,200	51,600	215,600	977,800	1,193,400
Total												
1. Preparatory Work	13,270	73,910	87,180	-	-	-	9,130	43,310	52,440	4,140	50,600	54,740
2. Boloti Reservoir	80,070	562,540	642,610	-	-	-	80,070	562,540	642,610	-	-	-
3. Tubewell, 12 Nos.-+3 Nos.	13,140	326,700	339,840	-	-	-	-	-	-	13,140	326,700	339,840
4. Sanya Chimi Irrigation System	140,020	535,050	675,070	-	-	-	71,400	256,050	327,450	68,620	283,000	351,620
5. Office and Quarter	32,700	50,500	83,200	-	-	-	30,900	47,500	78,400	1,800	3,000	4,800
6. O & M Equipment	-	92,400	92,400	-	-	-	-	46,200	46,200	-	-	46,200
7. Administration Expenses	6,400	-	6,400	1,800	-	1,800	3,200	-	3,200	1,400	-	1,400
8. Engineering Services	-	274,400	274,400	-	79,500	79,500	-	77,600	77,600	-	-	77,600
Sub-total	285,600	1,919,500	2,205,100	1,800	79,500	81,300	194,700	1,072,900	1,267,600	89,100	767,100	856,200
9. Physical Contingency	28,400	192,500	220,900	200	8,000	8,200	19,300	107,300	126,600	8,900	8,900	86,100
Sub-total	314,000	2,112,000	2,426,000	2,000	87,500	89,500	214,000	1,180,200	1,394,200	98,000	844,300	942,300
10. Price Contingency	266,000	259,000	525,000	600	4,400	5,000	147,800	121,100	268,900	117,600	133,500	251,100
Total	580,000	2,371,000	2,951,000	2,600	91,900	94,500	361,800	1,301,300	1,663,100	215,600	977,800	1,193,400
II. OTHER COST												
	16,240	185,600	201,840	-	-	-	7,060	90,540	97,600	9,180	95,060	104,240
III. GRAND TOTAL												
	596,240	2,556,600	3,152,840	2,600	91,900	94,500	368,860	1,391,840	1,760,700	224,780	1,072,860	1,297,640

Note: Price contingency is estimated based on the annual increase rate of 5% and 30% for foreign currency portion and local currency portion respectively. Cost of Tubewell includes electric low tension lines and rural water supply facilities and Sanya irrigation system includes construction cost of roads.

表-5 経済事業費及び便益の流れ

IRR 15.1 %
 B/C (10%) 1,156 million Tsh.
 B/C (10%) 1.55

(Unit: 1,000 Tsh.)

Year	Cost				Benefit			Balance
	Capital	Replacement	O&M	Total	Irrigation	Negative	Total	
1	89,500	0	0	89,500	0	0	0	-89,500
2	1,394,200	0	0	1,394,200	0	0	0	-1,394,200
3	942,300	0	7,822	950,122	84,009	-29	83,980	-866,142
4	0	0	13,183	13,183	224,697	-29	224,668	211,485
5	0	0	13,183	13,183	297,145	-29	297,116	283,933
6	0	0	13,183	13,183	369,592	-29	369,563	356,380
7	0	0	13,183	13,183	442,040	-29	442,011	428,828
8	0	24,100	13,183	37,283	482,984	-29	482,955	445,672
9	0	0	13,183	13,183	482,984	-29	482,955	469,772
10	0	0	13,183	13,183	482,984	-29	482,955	469,772
11	0	0	13,183	13,183	482,984	-29	482,955	469,772
12	0	0	13,183	13,183	482,984	-29	482,955	469,772
13	0	92,400	13,183	105,583	482,984	-29	482,955	377,372
14	0	0	13,183	13,183	482,984	-29	482,955	469,772
15	0	0	13,183	13,183	482,984	-29	482,955	469,772
16	0	0	13,183	13,183	482,984	-29	482,955	469,772
17	0	0	13,183	13,183	482,984	-29	482,955	469,772
18	0	24,100	13,183	37,283	482,984	-29	482,955	445,672
19	0	0	13,183	13,183	482,984	-29	482,955	469,772
20	0	0	13,183	13,183	482,984	-29	482,955	469,772
21	0	0	13,183	13,183	482,984	-29	482,955	469,772
22	0	0	13,183	13,183	482,984	-29	482,955	469,772
23	0	92,400	13,183	105,583	482,984	-29	482,955	377,372
24	0	0	13,183	13,183	482,984	-29	482,955	469,772
25	0	0	13,183	13,183	482,984	-29	482,955	469,772
26	0	0	13,183	13,183	482,984	-29	482,955	469,772
27	0	0	13,183	13,183	482,984	-29	482,955	469,772
28	0	192,900	13,183	206,083	482,984	-29	482,955	276,872
29	0	0	13,183	13,183	482,984	-29	482,955	469,772
30	0	0	13,183	13,183	482,984	-29	482,955	469,772
31	0	0	13,183	13,183	482,984	-29	482,955	469,772
32	0	0	13,183	13,183	482,984	-29	482,955	469,772
33	0	92,400	13,183	105,583	482,984	-29	482,955	377,372
34	0	0	13,183	13,183	482,984	-29	482,955	469,772
35	0	0	13,183	13,183	482,984	-29	482,955	469,772
36	0	0	13,183	13,183	482,984	-29	482,955	469,772
37	0	0	13,183	13,183	482,984	-29	482,955	469,772
38	0	24,100	13,183	37,283	482,984	-29	482,955	445,672
39	0	0	13,183	13,183	482,984	-29	482,955	469,772
40	0	0	13,183	13,183	482,984	-29	482,955	469,772
41	0	0	13,183	13,183	482,984	-29	482,955	469,772
42	0	0	13,183	13,183	482,984	-29	482,955	469,772
43	0	92,400	13,183	105,583	482,984	-29	482,955	377,372
44	0	0	13,183	13,183	482,984	-29	482,955	469,772
45	0	0	13,183	13,183	482,984	-29	482,955	469,772
46	0	0	13,183	13,183	482,984	-29	482,955	469,772
47	0	0	13,183	13,183	482,984	-29	482,955	469,772
48	0	24,100	13,183	37,283	482,984	-29	482,955	445,672
49	0	0	13,183	13,183	482,984	-29	482,955	469,772
50	0	0	13,183	13,183	482,984	-29	482,955	469,772

表-6 事業の資金繰り表

(Unit: Tsh. 1,000)

Year	Capital Cost			Cash Outflow			Cash Inflow			Repayment Balance		
	Order	FC	LC	Loan Repayment	O & M	Replacement	Total	Fund	Revenue		Total	
in				Interest	Principal	Cost	Cost	FC	LC			
1		91,900	2,600	919	0	0	0	95,419	91,900	2,600	94,500	0
2		1,301,300	361,800	13,932	0	0	0	1,677,032	1,301,300	361,800	1,663,100	13,932
3		977,800	215,600	23,710	0	7,822	0	1,224,932	977,800	215,600	1,201,222	23,710
4		0	0	23,710	0	13,183	0	36,893	0	0	13,183	23,710
5		0	0	23,710	0	13,183	0	36,893	0	0	13,183	23,710
6		0	0	23,710	0	13,183	0	36,893	0	0	13,183	23,710
7		0	0	23,710	0	13,183	0	36,893	0	0	13,183	23,710
8		0	0	23,710	0	13,183	24,100	60,993	0	0	13,183	47,810
9		0	0	23,710	0	13,183	0	36,893	0	0	13,183	23,710
10		0	0	23,710	0	13,183	0	36,893	0	0	13,183	23,710
11		0	0	22,525	118,550	13,183	0	154,258	0	0	13,183	141,075
12		0	0	21,339	118,550	13,183	0	153,072	0	0	13,183	139,889
13		0	0	20,154	118,550	13,183	92,400	244,287	0	0	13,183	231,104
14		0	0	18,968	118,550	13,183	0	150,701	0	0	13,183	137,518
15		0	0	17,783	118,550	13,183	0	149,516	0	0	13,183	136,333
16		0	0	16,597	118,550	13,183	0	148,330	0	0	13,183	135,147
17		0	0	15,412	118,550	13,183	0	147,145	0	0	13,183	133,962
18		0	0	14,226	118,550	13,183	24,100	170,059	0	0	13,183	156,876
19		0	0	13,041	118,550	13,183	0	144,774	0	0	13,183	131,591
20		0	0	11,855	118,550	13,183	0	143,588	0	0	13,183	130,405
21		0	0	10,670	118,550	13,183	0	142,403	0	0	13,183	129,220
22		0	0	9,484	118,550	13,183	0	141,217	0	0	13,183	128,034
23		0	0	8,299	118,550	13,183	92,400	232,432	0	0	13,183	219,249
24		0	0	7,113	118,550	13,183	0	138,846	0	0	13,183	125,663
25		0	0	5,928	118,550	13,183	0	137,661	0	0	13,183	124,478
26		0	0	4,742	118,550	13,183	0	136,475	0	0	13,183	123,292
27		0	0	3,557	118,550	13,183	0	135,290	0	0	13,183	122,107
28		0	0	2,371	118,550	13,183	192,900	327,004	0	0	13,183	313,821
29		0	0	1,186	118,550	13,183	0	132,919	0	0	13,183	119,736
30		0	0	0	118,550	13,183	0	131,733	0	0	13,183	118,550

Remarks: FC = Foreign Currency, LC = Local Currency

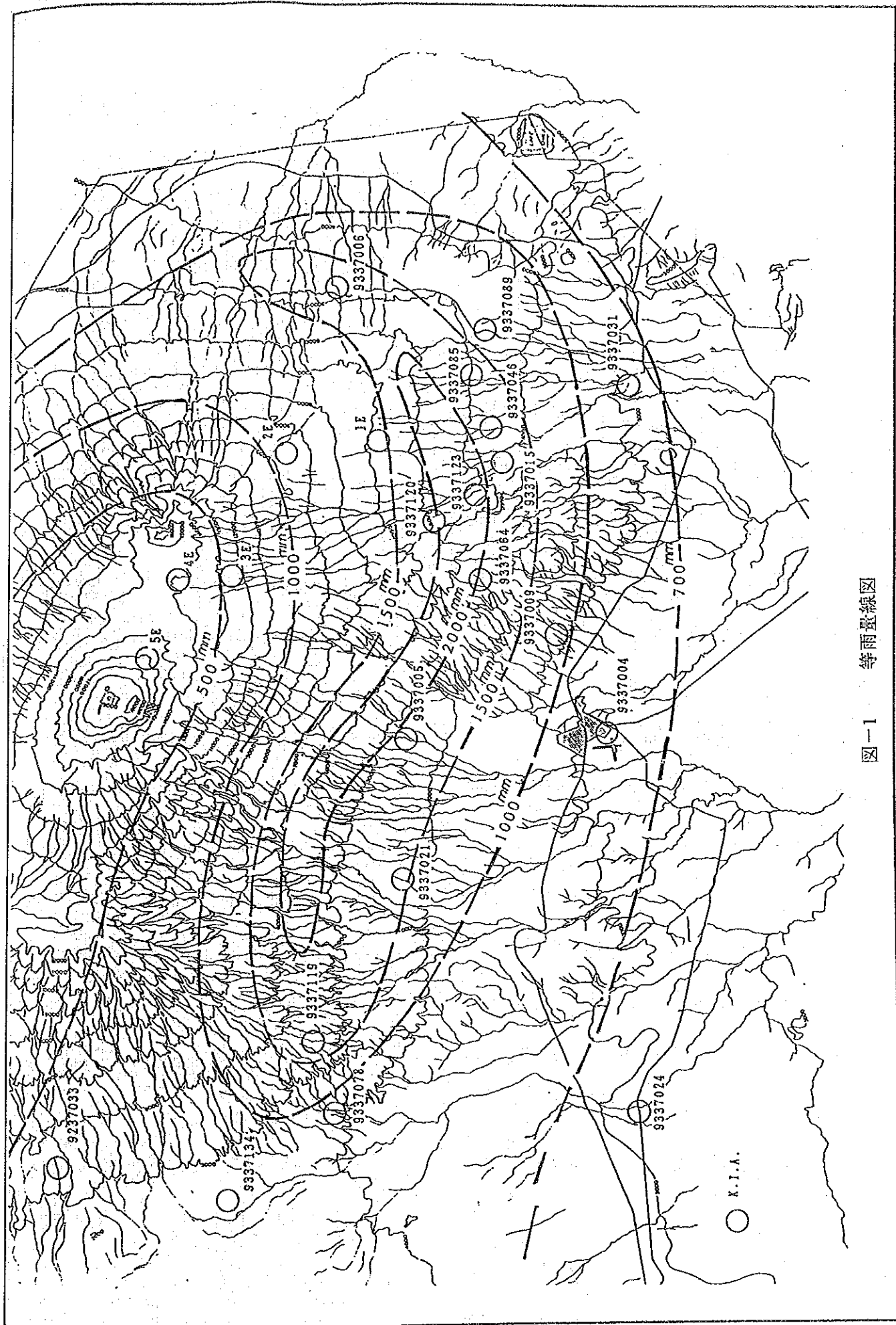
Condition of Loan Repayment of Foreign Currency:

Interest : 1.0%

Grace Period : 10 years

Repayment Period : 30 years (including grace period)

付図



图一1 等雨量线图

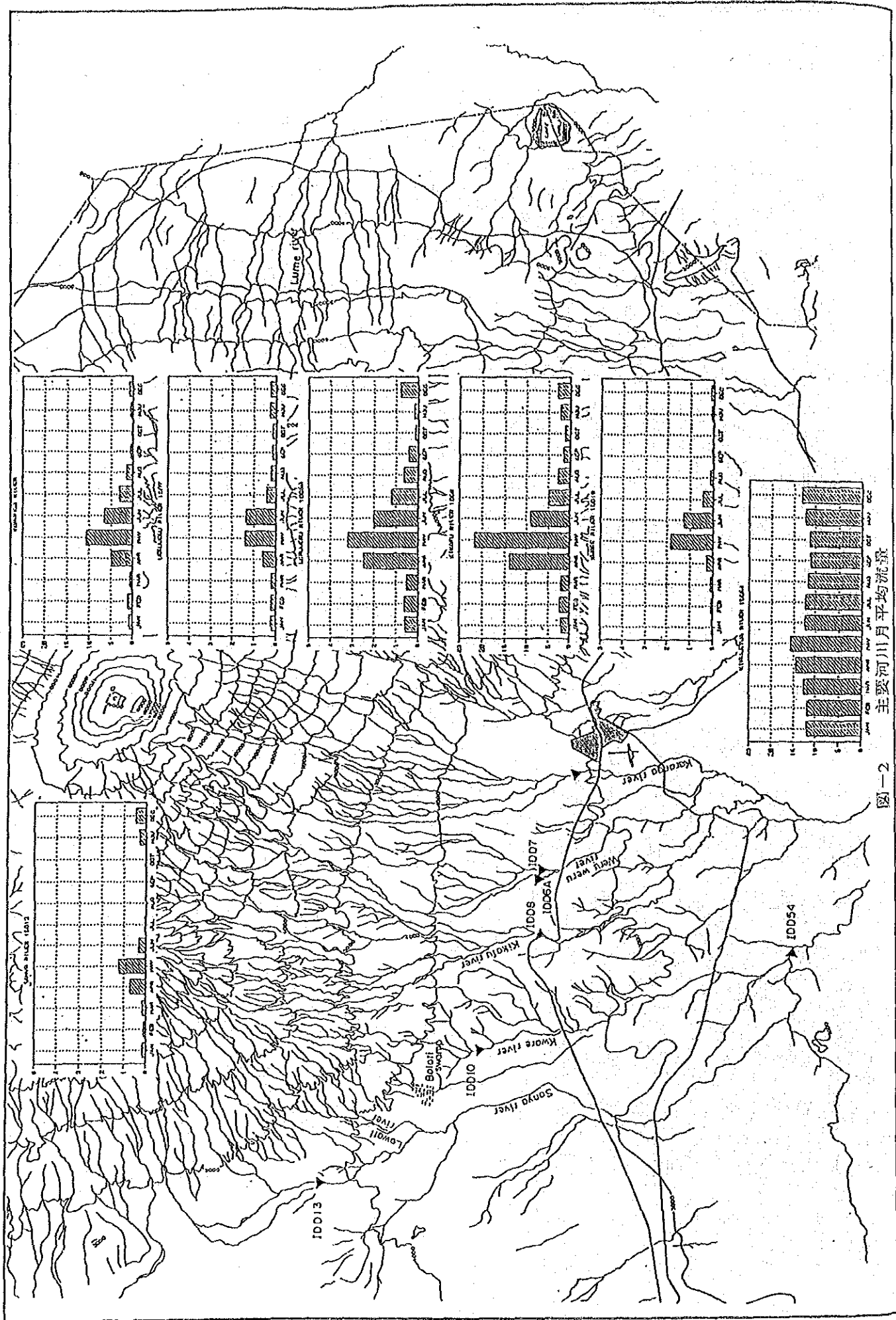
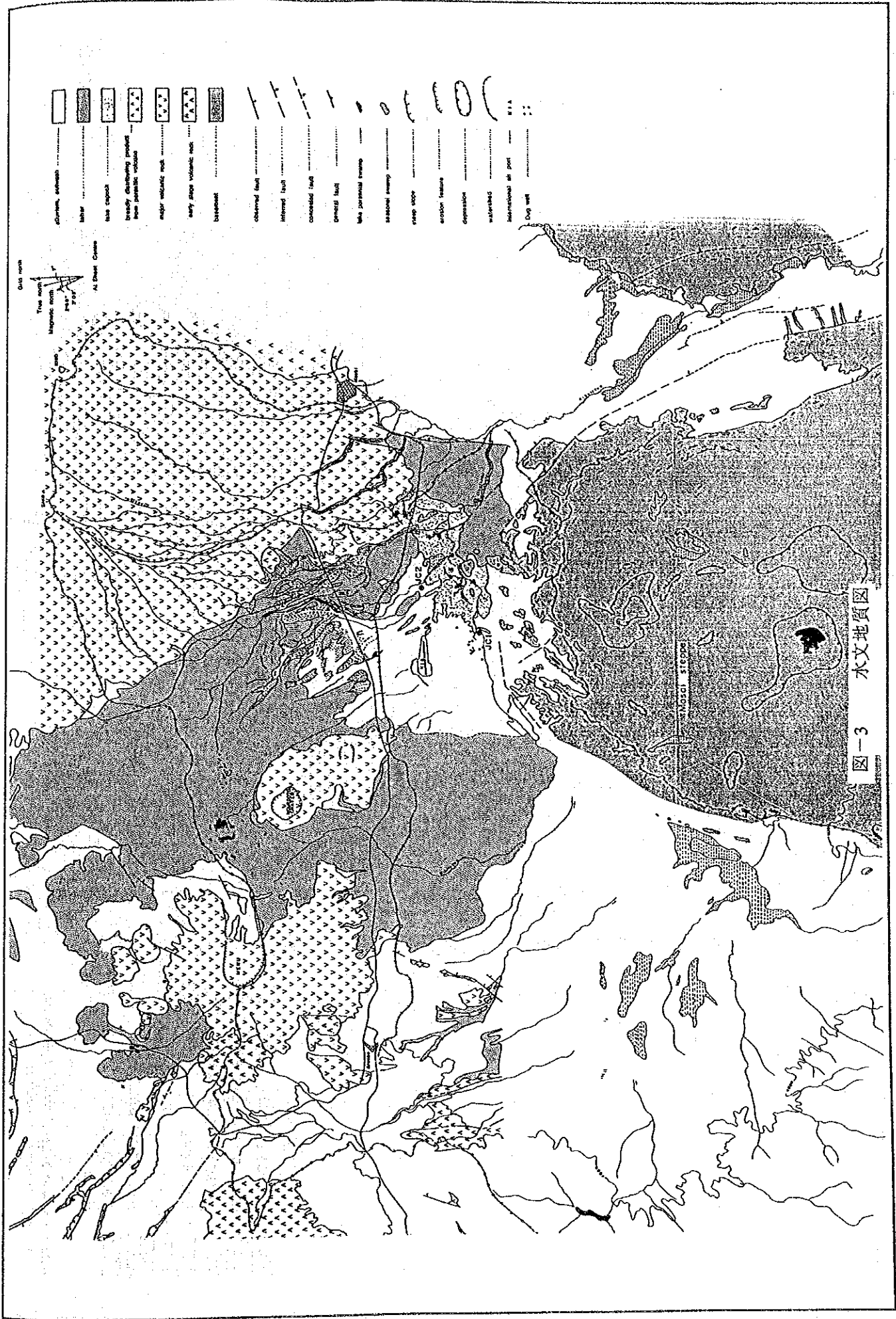


图-2 主要河川月平均流量



- Clayey, silty sand
- Silt
- Loose deposit
- Heavily decomposed granite from possible volcanic
- Major volcanic rock
- Very large volcanic rock
- Basaltic
- Observed fault
- Inferred fault
- Concealed fault
- General fault
- Wide potential swamp
- Seasonal swamp
- Deep slope
- Erosion feature
- Depression
- Waterbars
- Intermittent all port
- Deep well

图-3 水文地质图

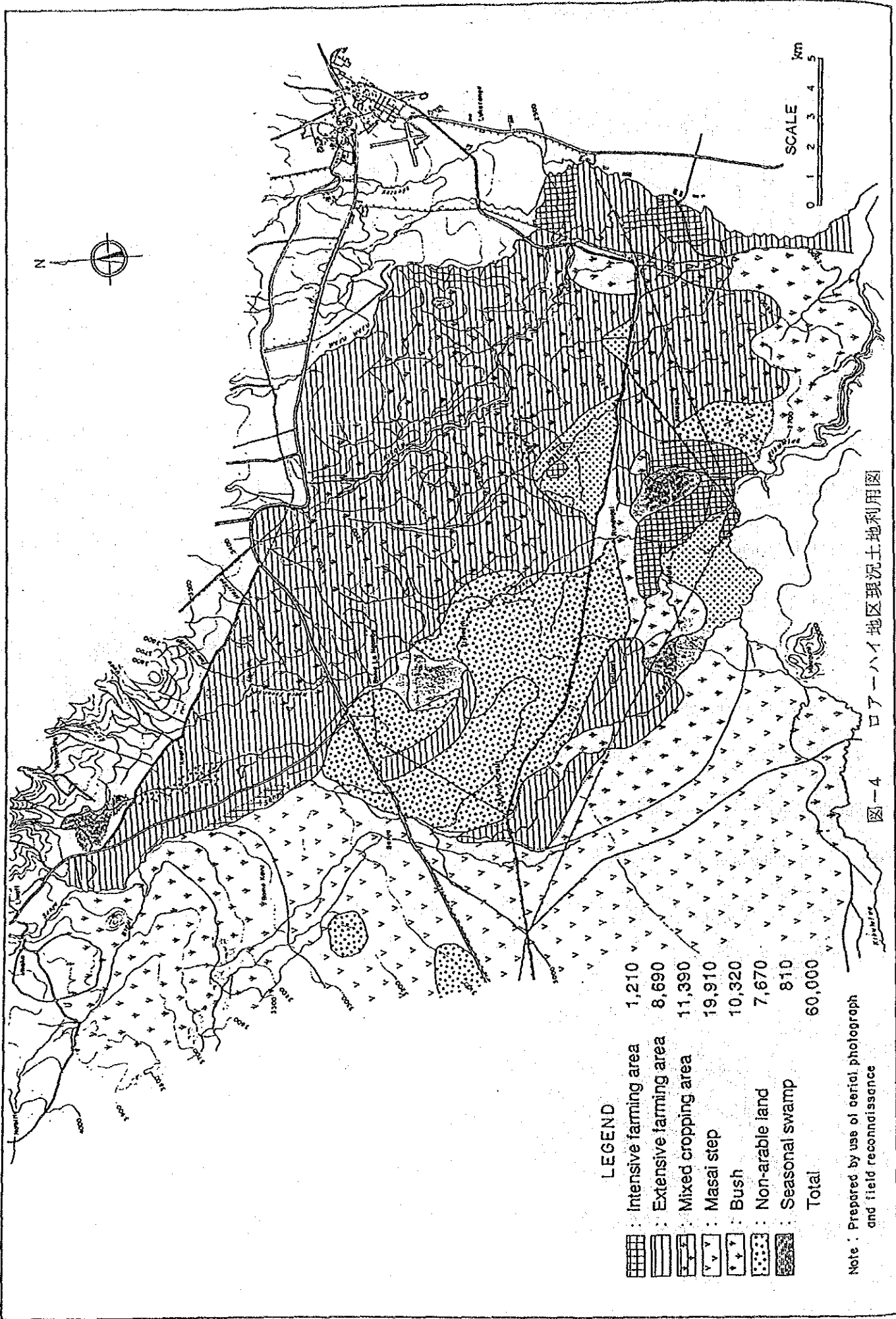
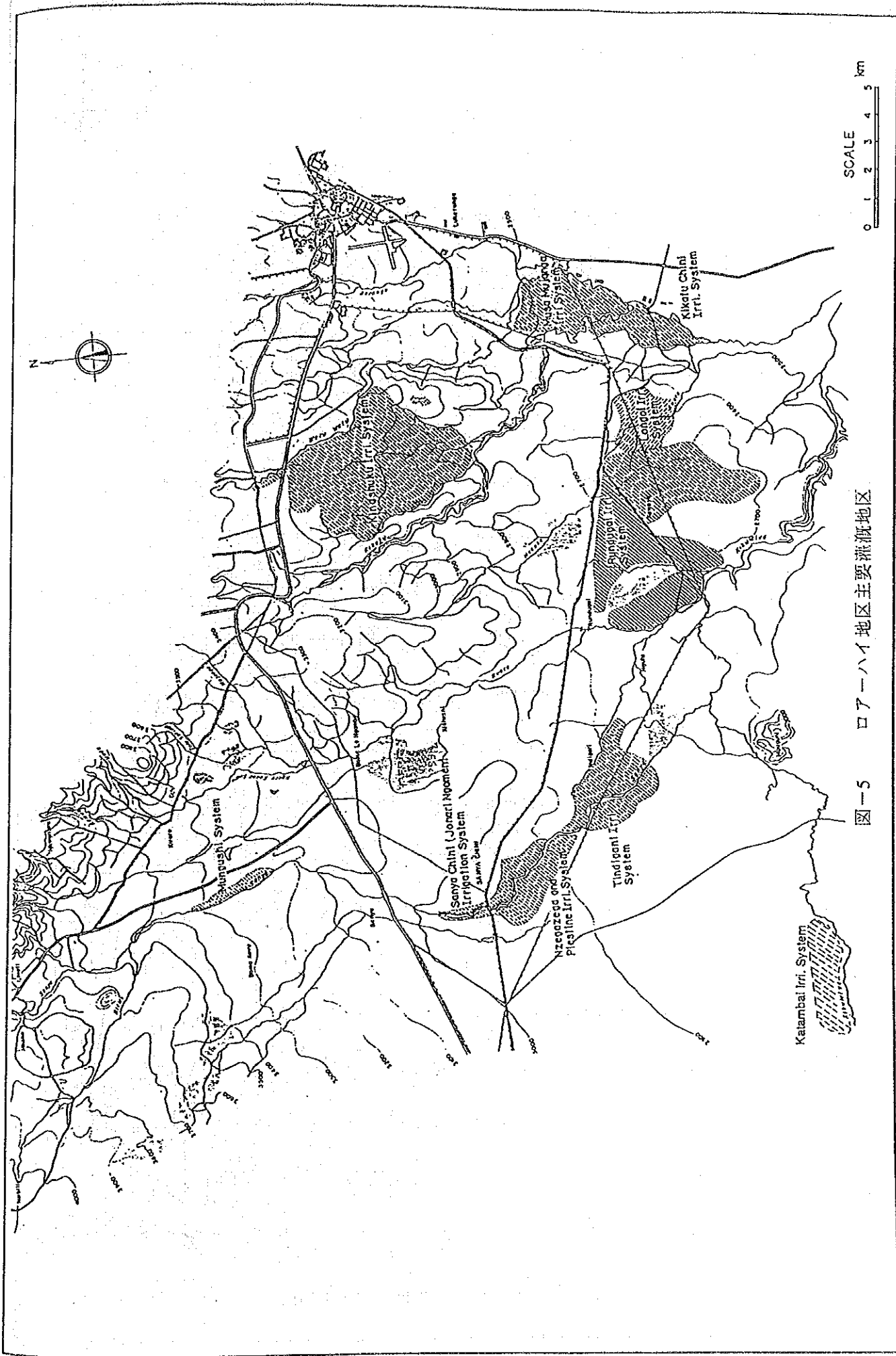


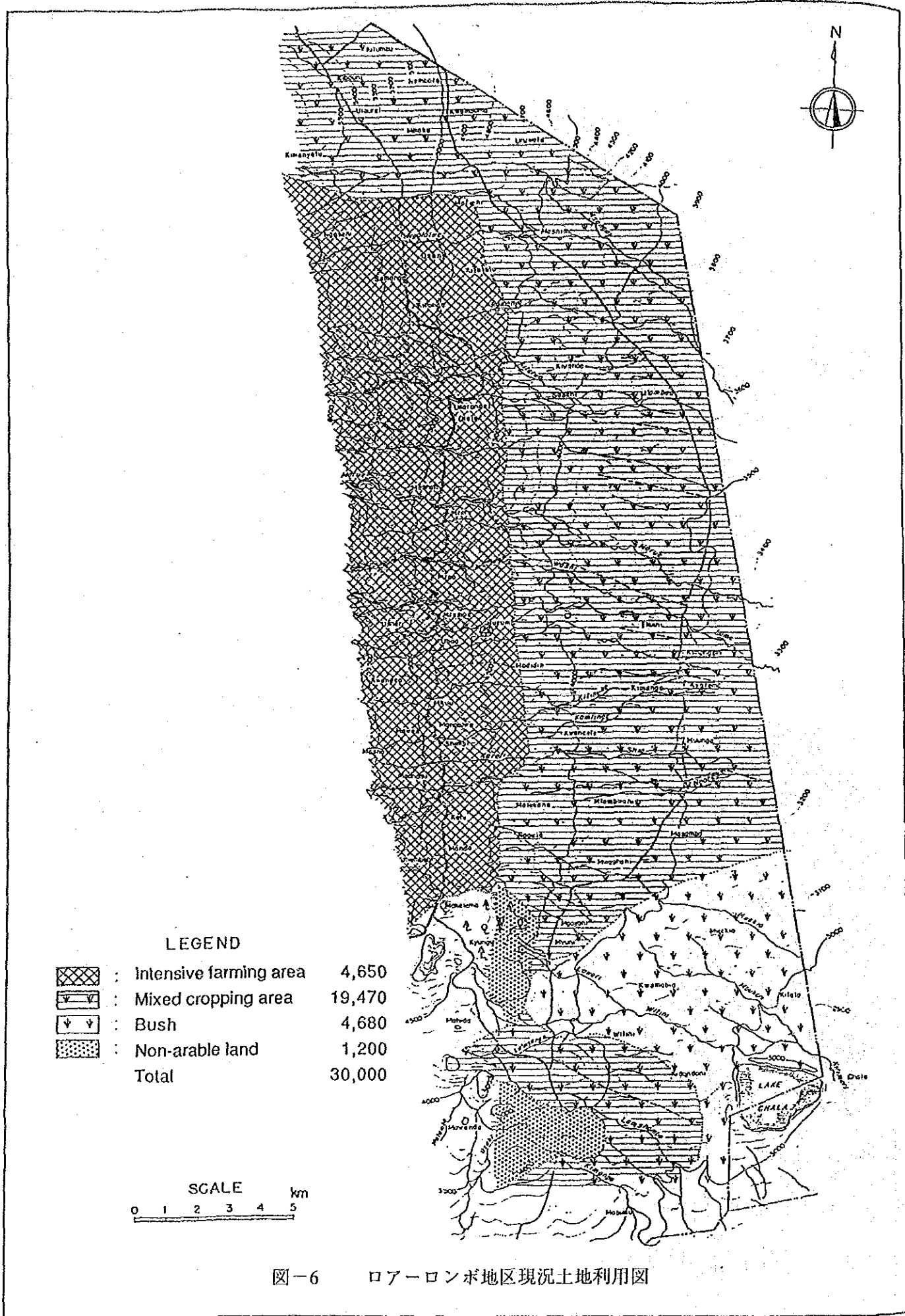
図-4 ロア-ハイ地区現況土地利用図

Note: Prepared by use of aerial photograph and field reconnaissance



SCALE
0 1 2 3 4 5 km

图一5 ロアーハイ地区主要灌溉地区



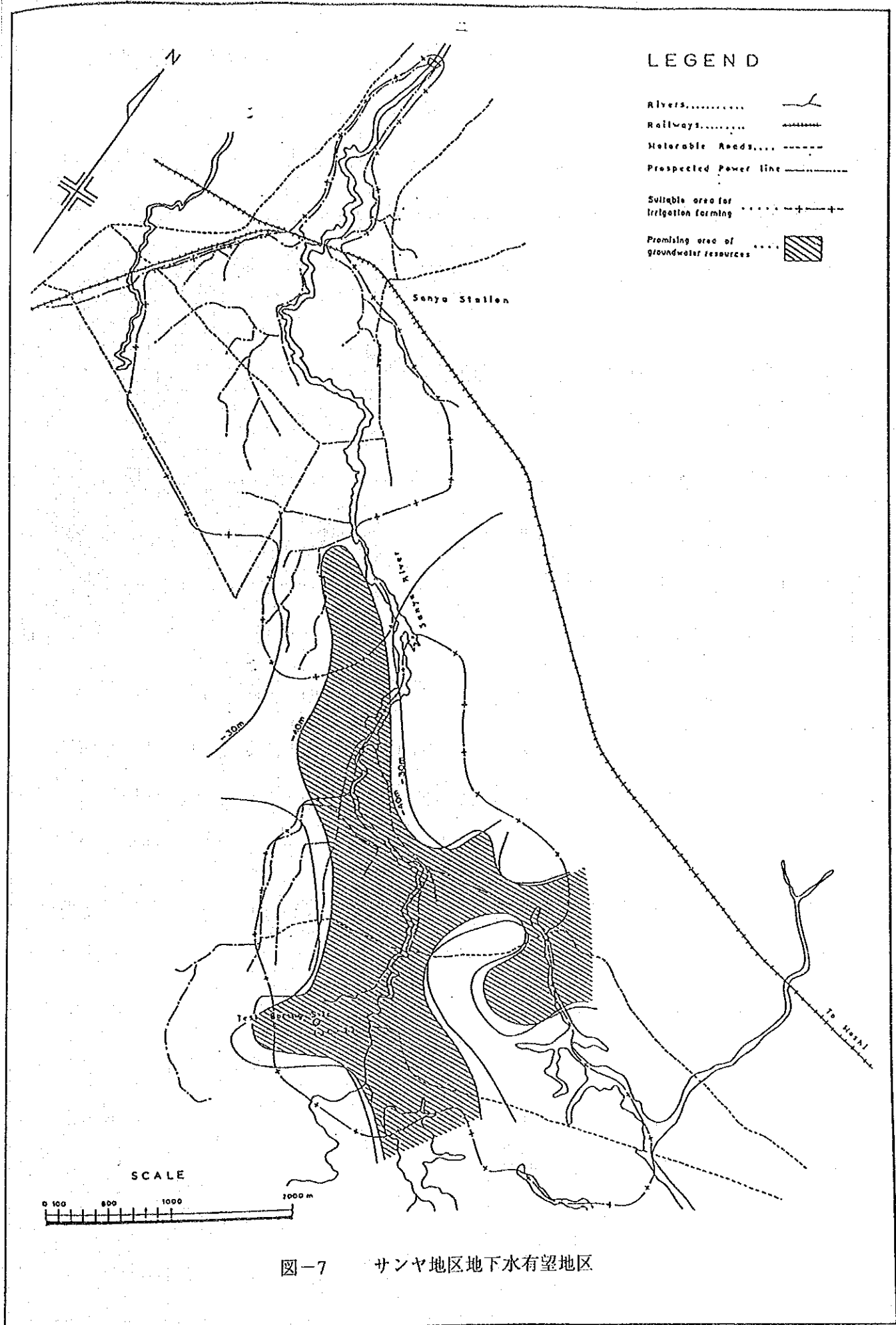
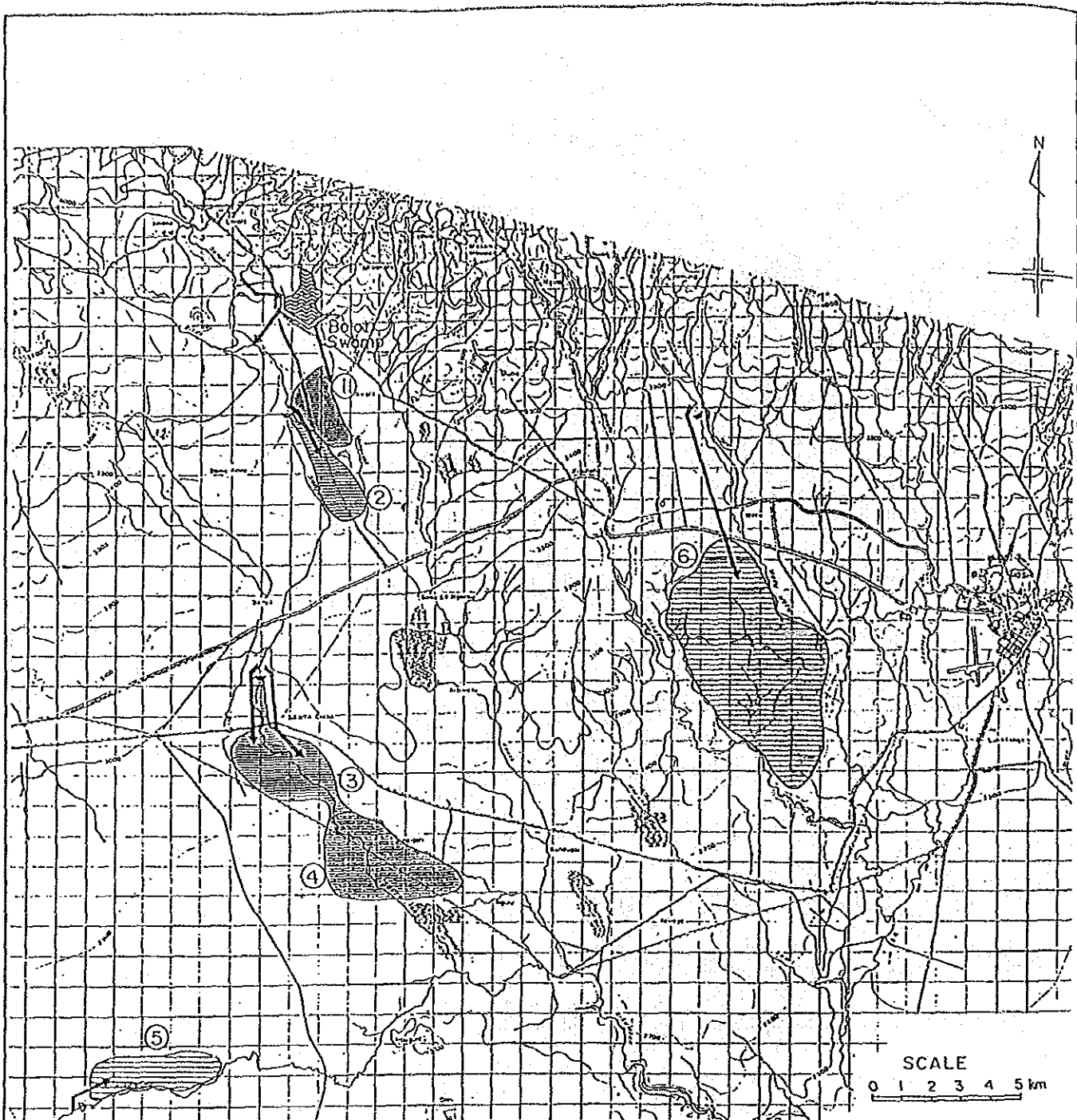


図-7 サンヤ地区地下水有望地区



- ① Boloti Area
- ② Mungushi Area
- ③ Sanya Plain
- ④ Sanya Plain (Groundwater available area)
- ⑤ Mtokuja Area
- ⑥ Kimoshuku Area

图-8 農業開発可能地区

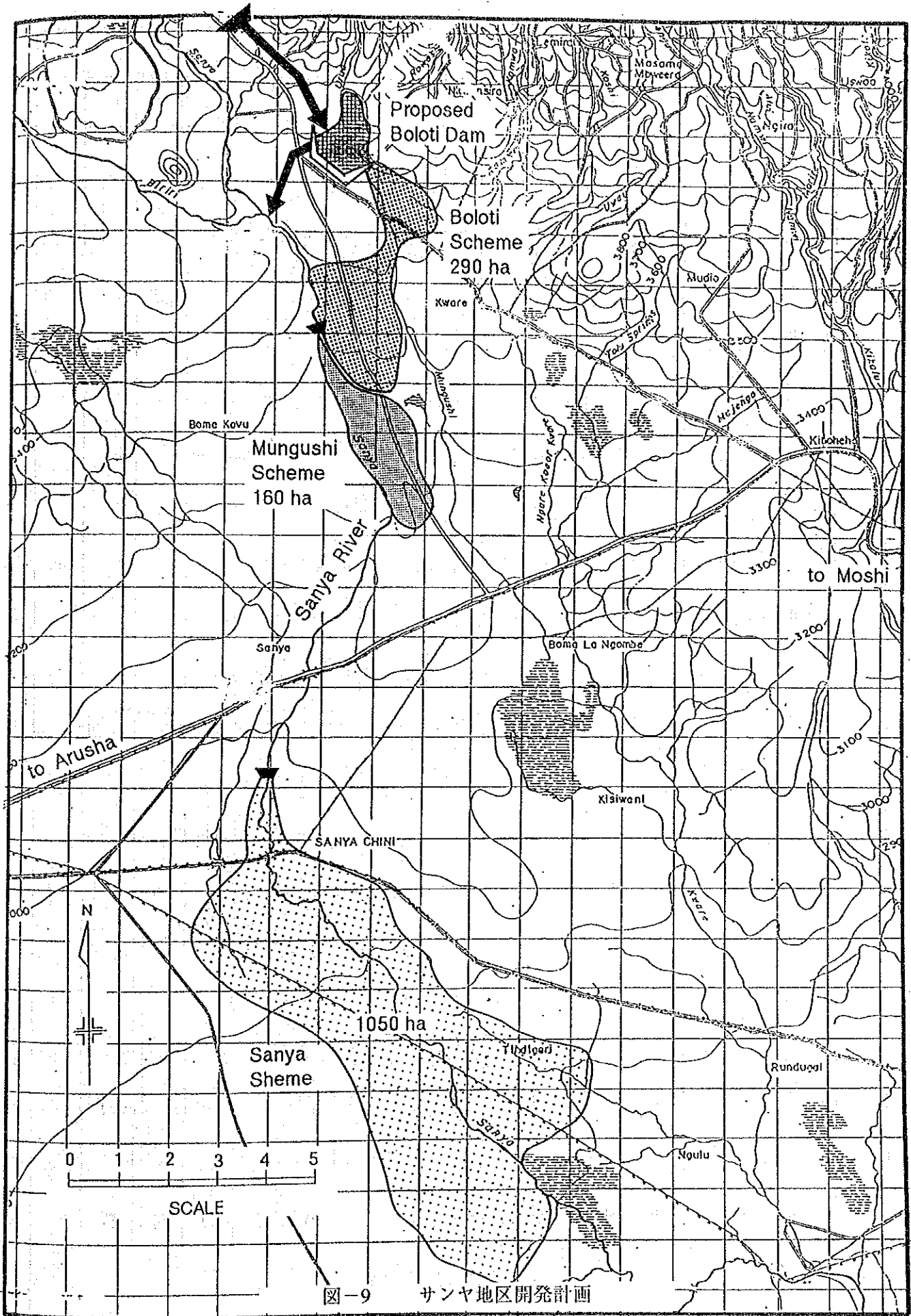


図-9 サンヤ地区開発計画

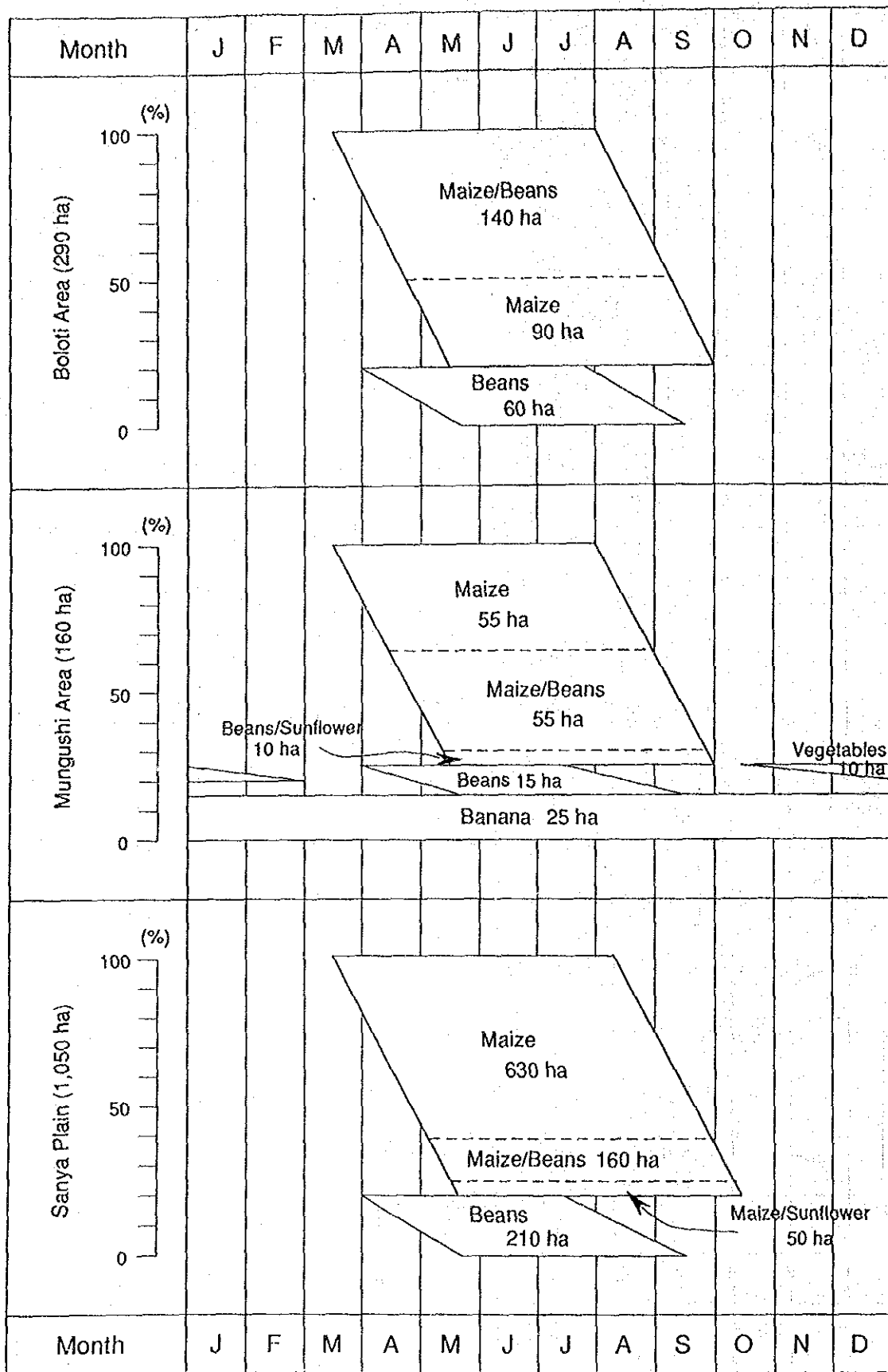


图-10 現況作付体系

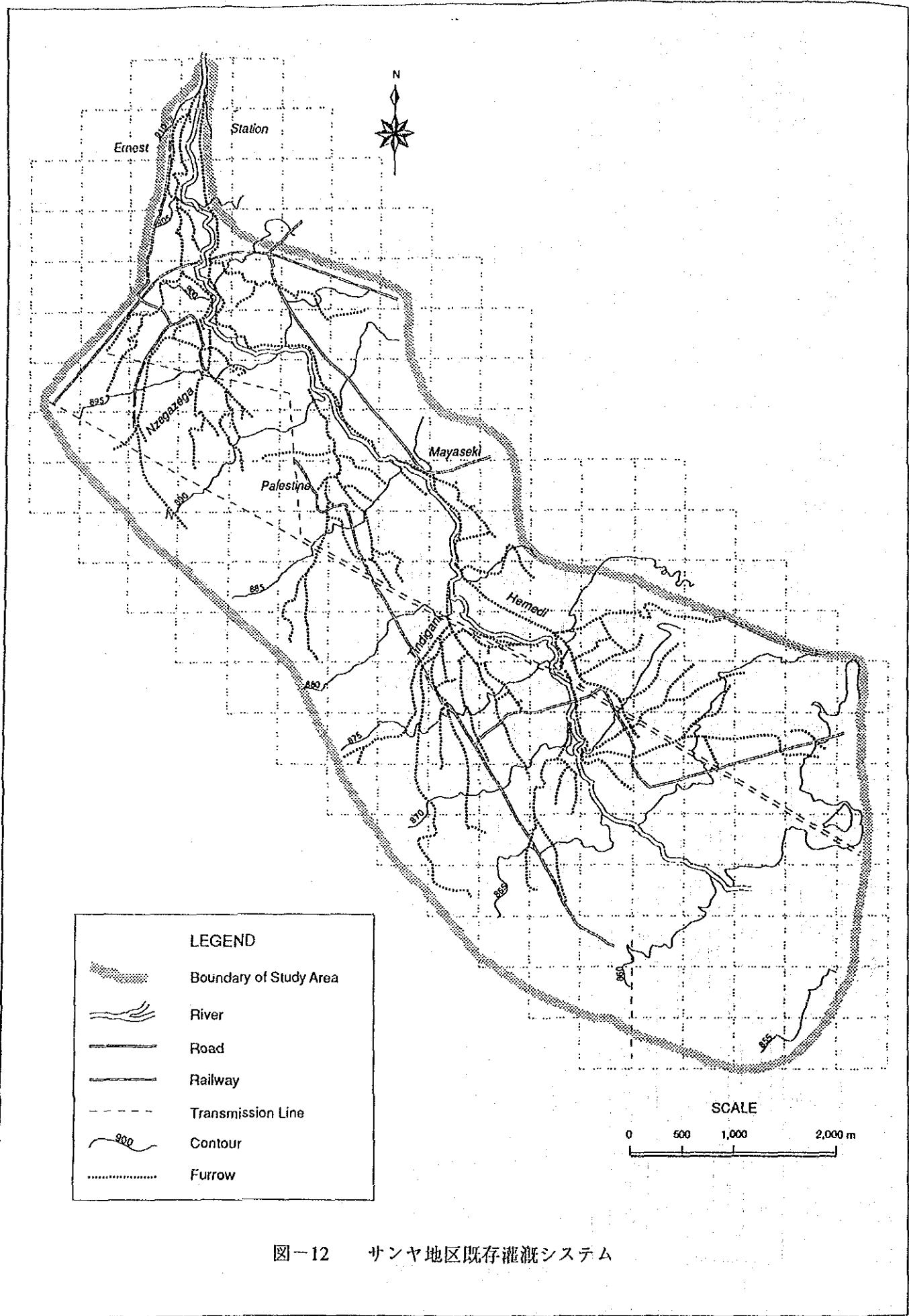


図-12 サンヤ地区既存灌漑システム

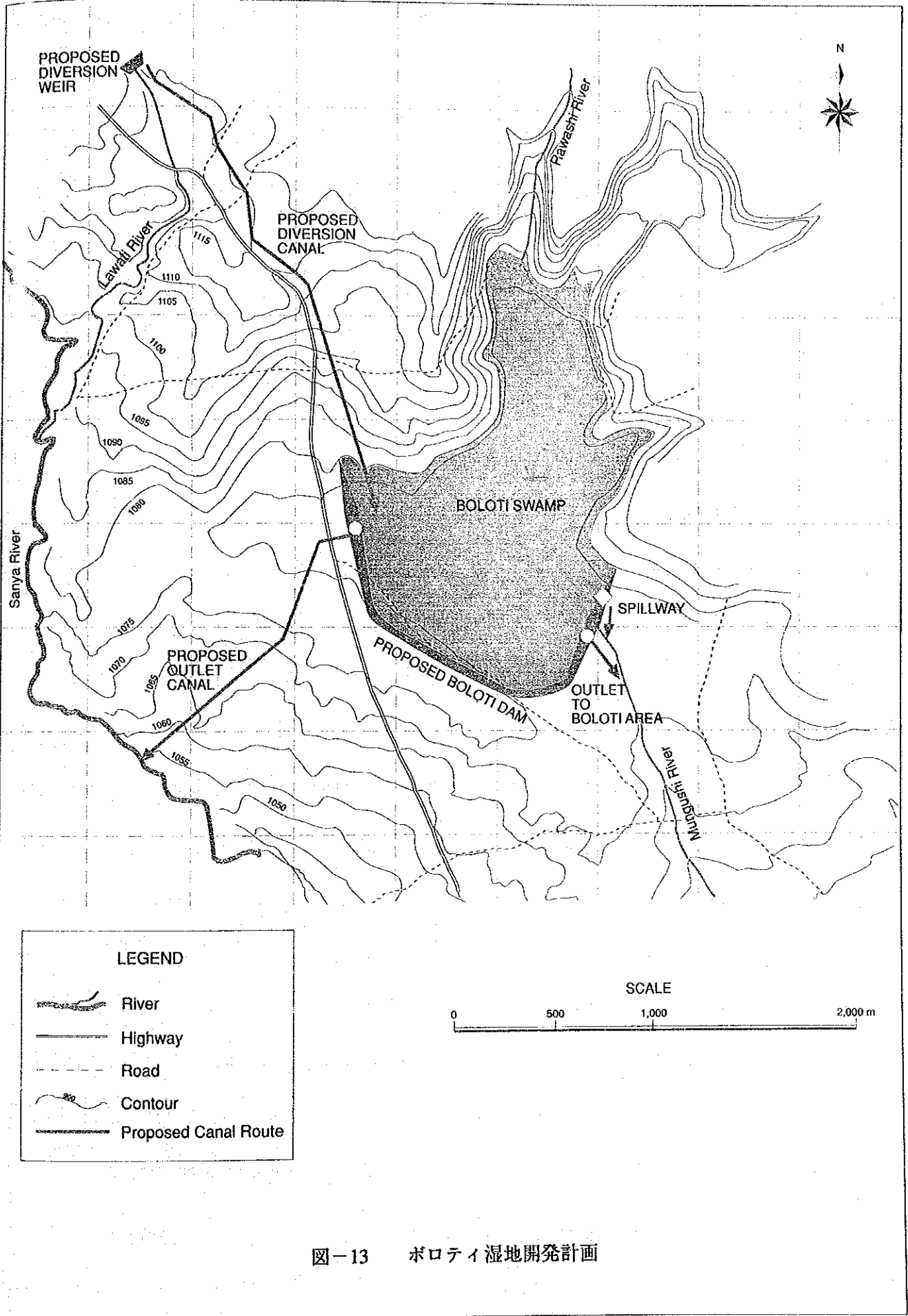


図-13 ボロテイ湿地開発計画

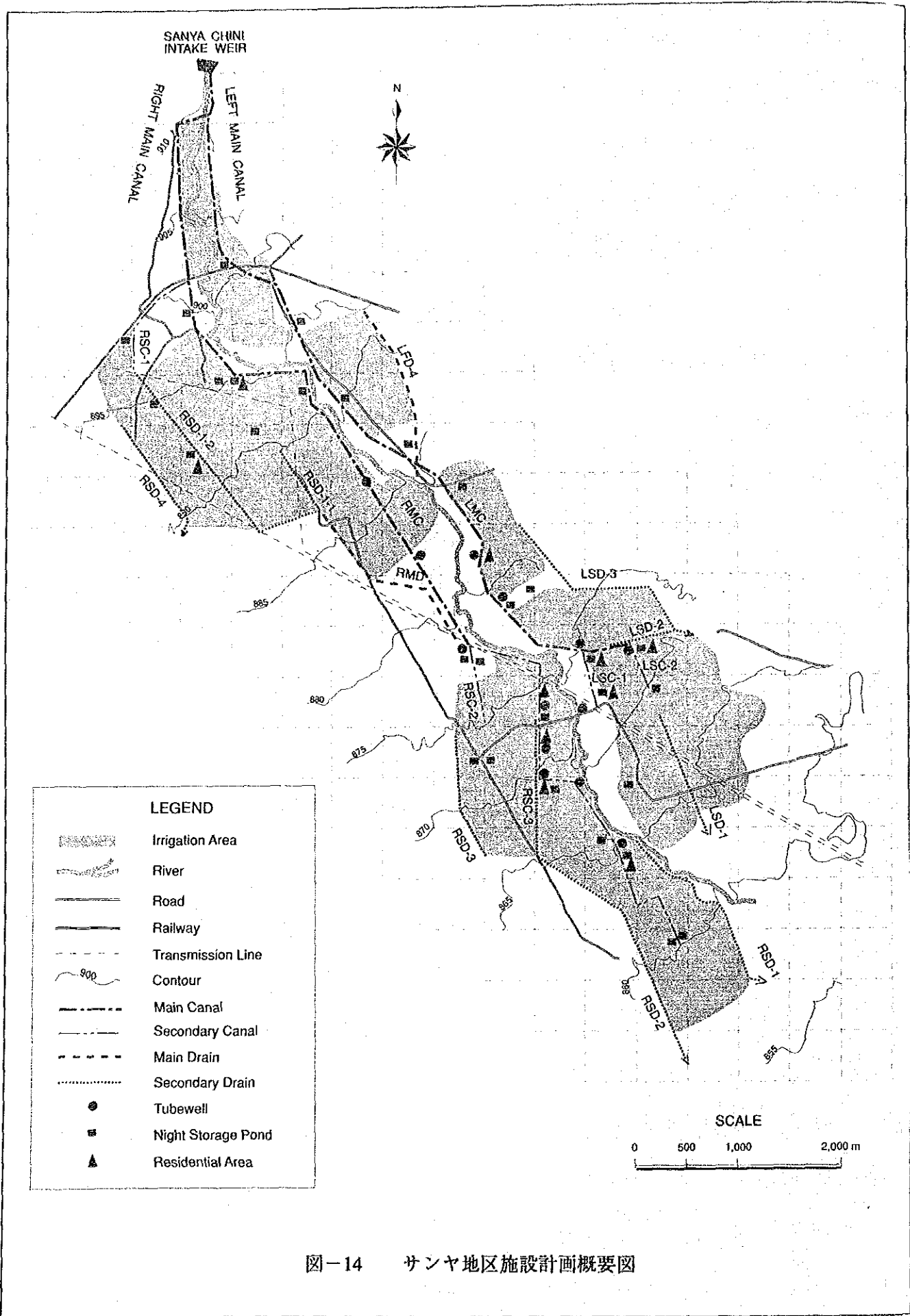


図-14 サンヤ地区施設計画概要図

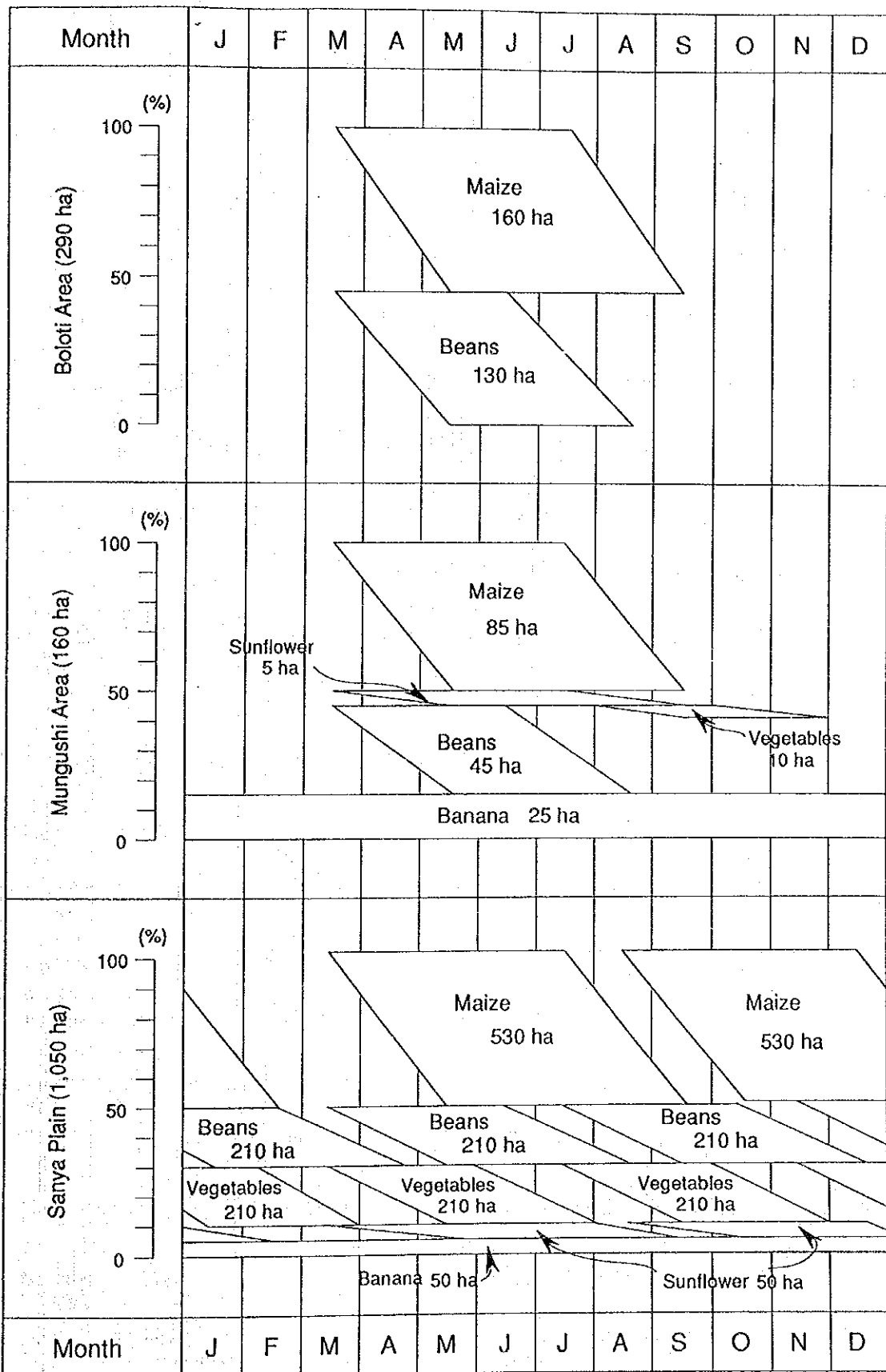
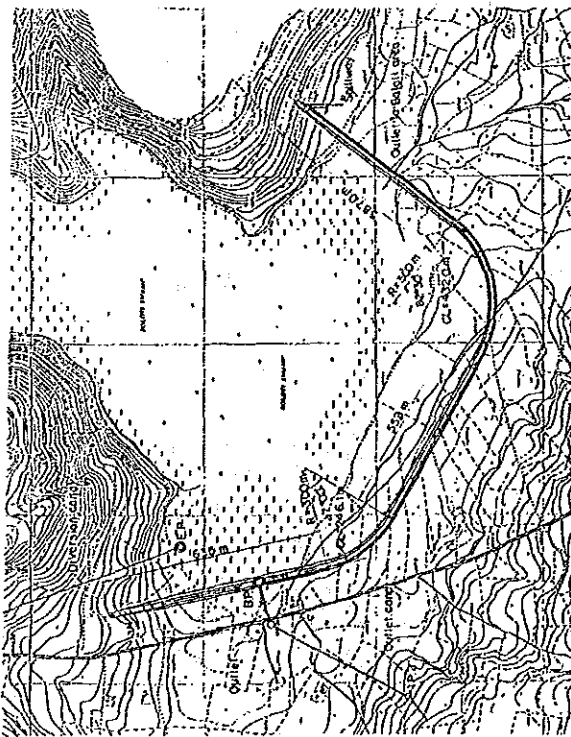
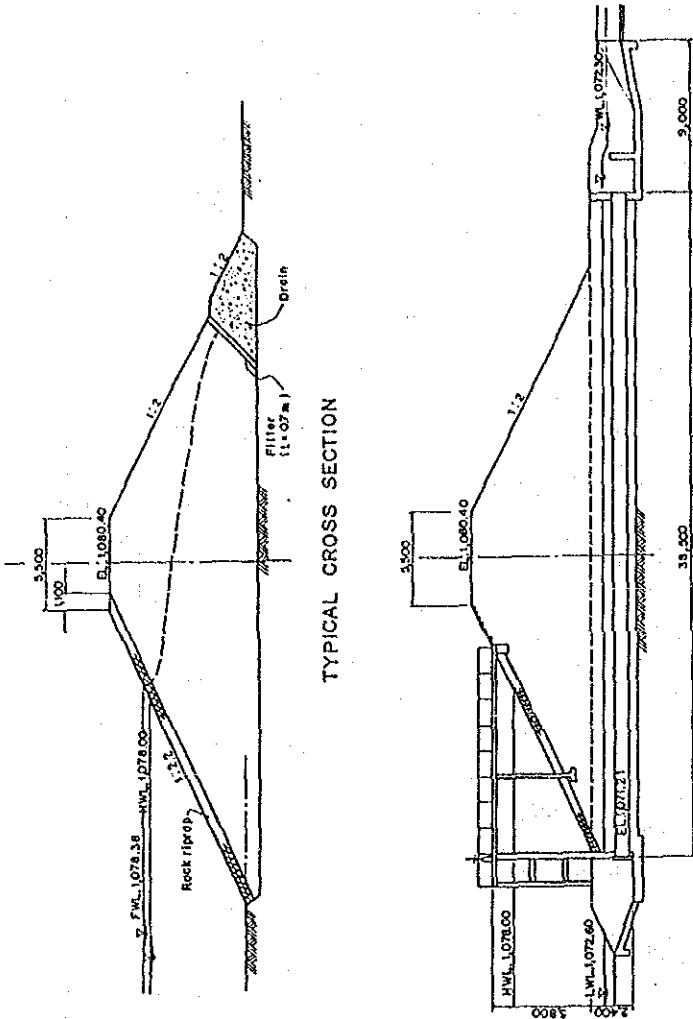


图-15 計画作付体系

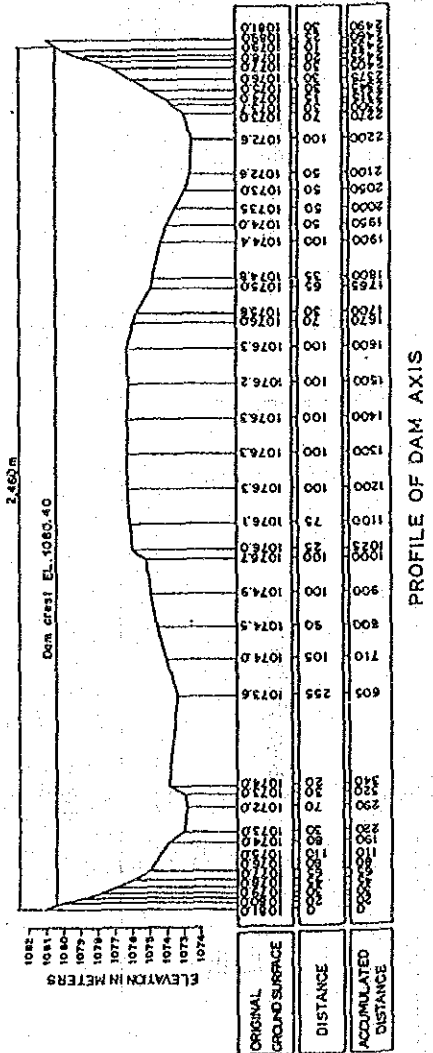


PLAN



TYPICAL CROSS SECTION

PROFILE OF OUTLET



PROFILE OF DAM AXIS

図-16 ボロテイダム概要

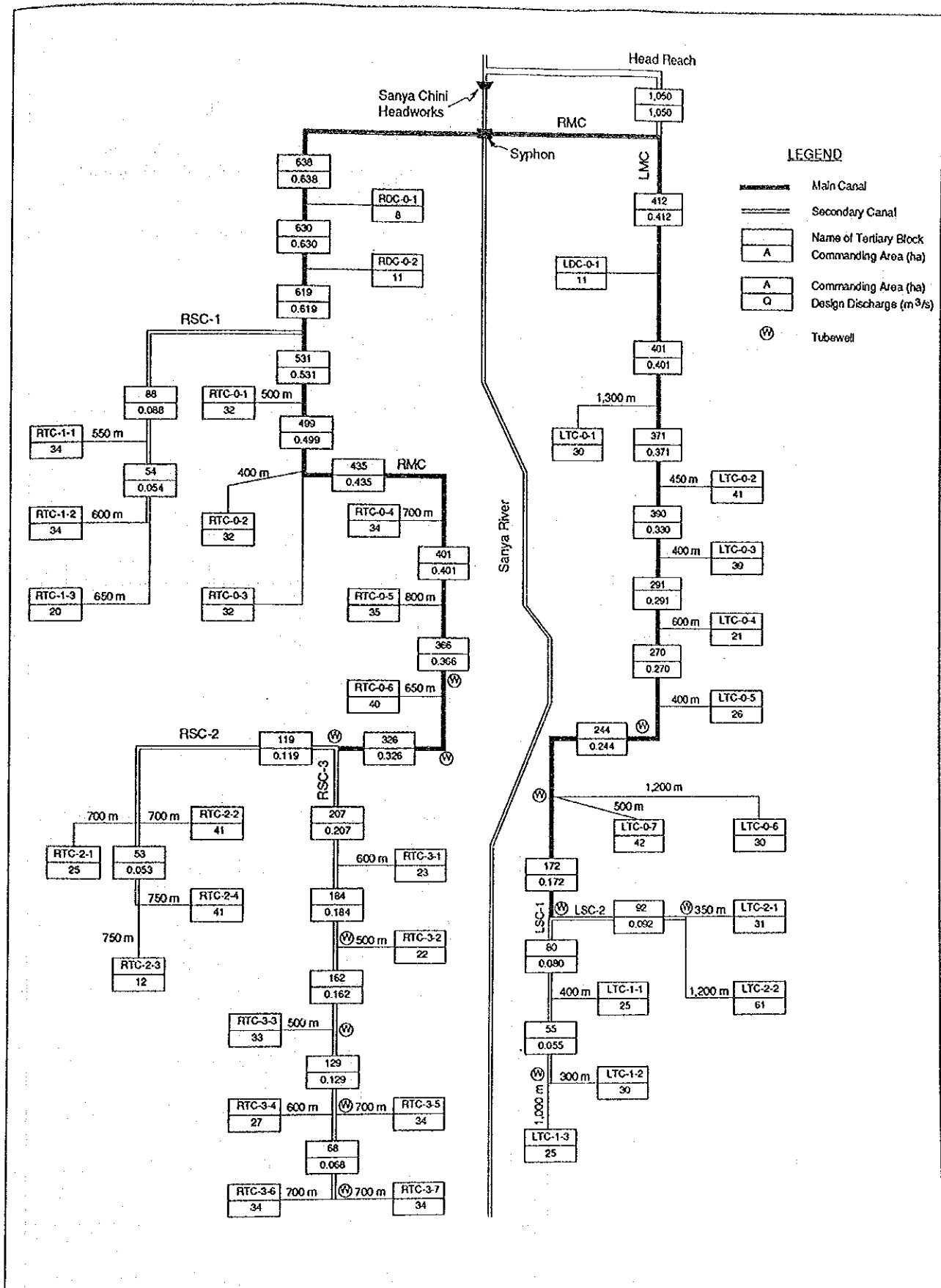


图-17 灌溉系统图

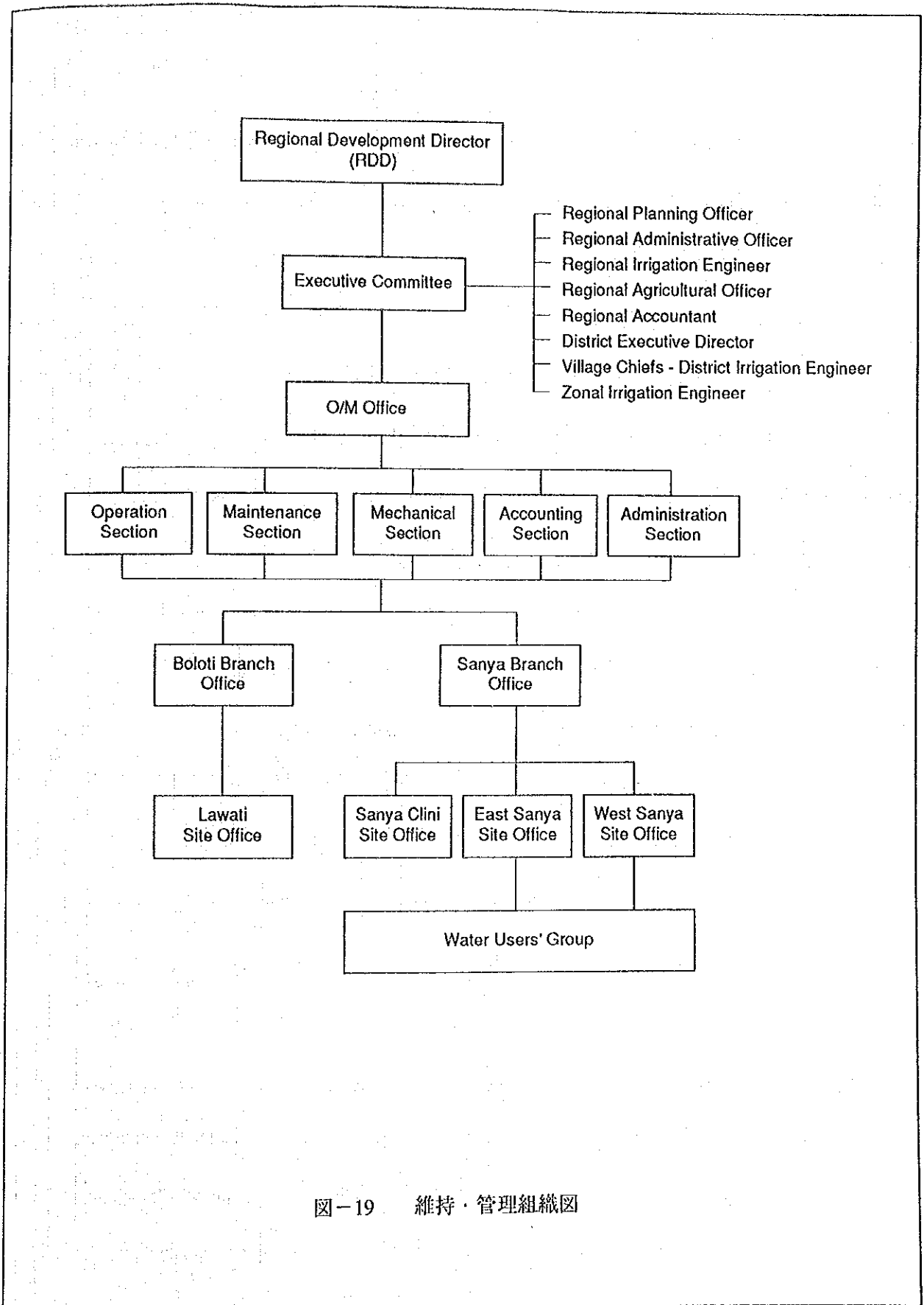


圖-19 維持・管理組織圖

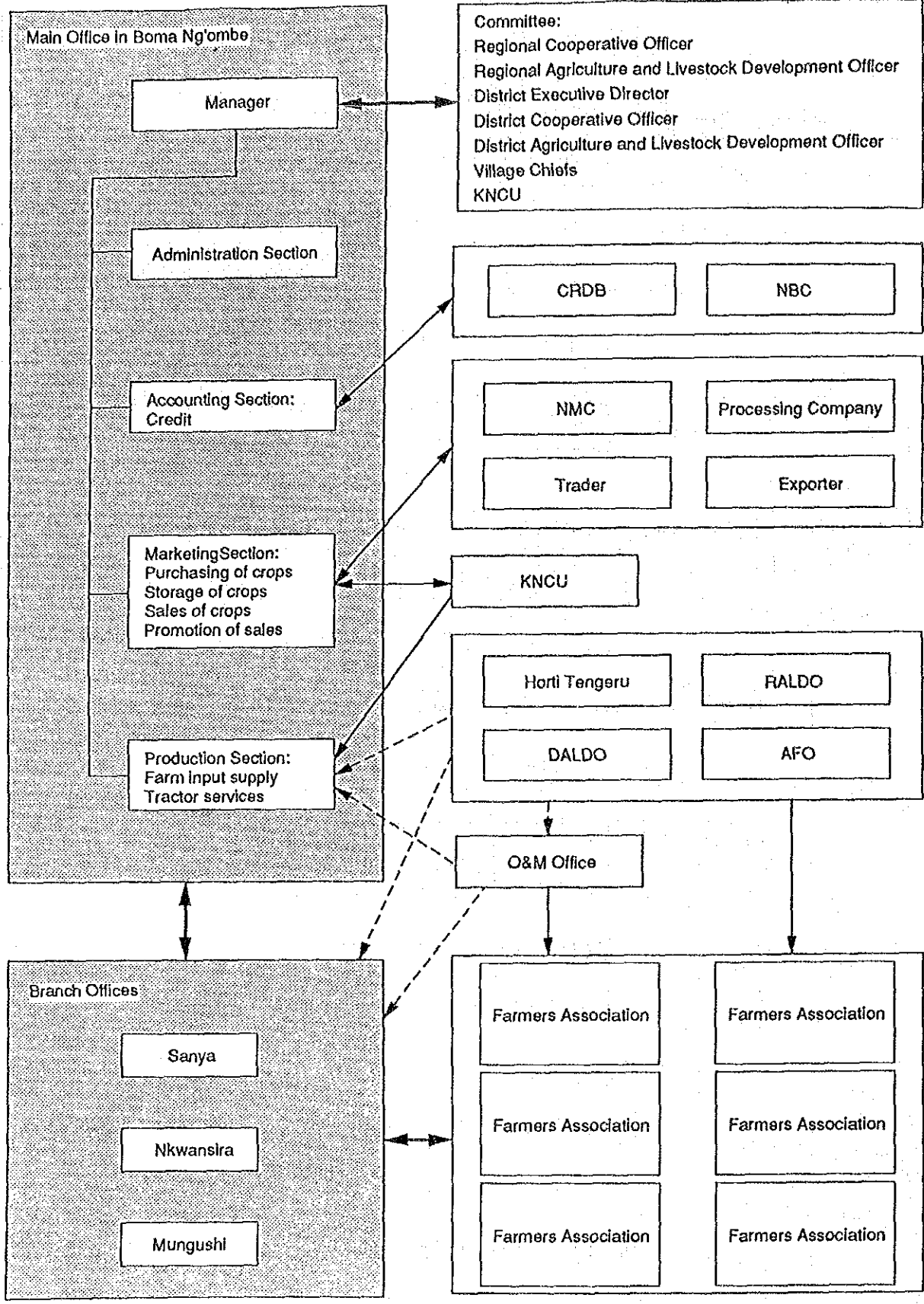


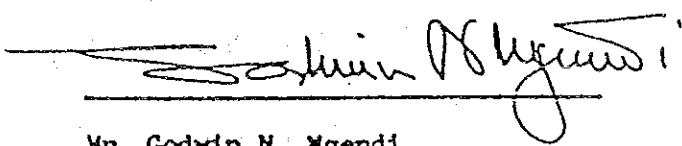
図-20 サンヤ川流域農業協同組合組織図


附属資料

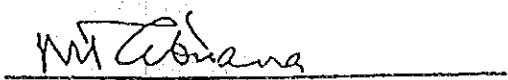
SCOPE OF WORK
FOR
THE FEASIBILITY STUDY
ON
LOWER HAI AND LOWER ROMBO AGRICULTURAL DEVELOPMENT PROJECT
IN
THE UNITED REPUBLIC OF TANZANIA

AGREED UPON
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
REGIONAL DEVELOPMENT DIRECTORATE, KILIMANJARO REGION

27th February, 1988, Moshi


Mr. Godwin N. Mgendi
Regional Development Director
Kilimanjaro Region


Mr. Kanazo Takeuchi
Leader of the Preliminary
Survey Team,
Japan International
Cooperation Agency


Mr. M. T. Kibwana
Ministry of Finance, Economic
Affairs and Planning

I. INTRODUCTION

In response to the request of the Government of the United Republic of Tanzania, the Government of Japan decided to conduct a Feasibility Study on Lower Hai and Lower Rombo Agricultural Development Project (hereinafter referred to as "the Study"), in accordance with the relevant laws and regulations in force in Japan.

Accordingly, Japan International Cooperation Agency; (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical cooperation programmes of the Government of Japan, will undertake the Study in close cooperation with the authorities of Tanzania.

The present document sets forth the scope of work for the Study.

II. OBJECTIVES OF THE STUDY

The objectives of the Study are;

1. To assess the availability of groundwater and surface water resources for agriculture development,
2. To identify subareas with high agriculture development potential, and
3. To formulate agriculture development plan(s) for selected priority subarea(s).

III. OUTLINE OF THE STUDY

1. Study Area

The Study covers Lower Hai and Lower Rombo areas of about 600 km².

2. Scope of the Study

The Study consists of three(3) phases as follows:

2-1 Phase I

Preliminary study for the availability of groundwater and surface water resources is conducted, and provisional selection of subareas

for feasibility study in the Phase II is made through the following activities.

- (1) Aerial photography (1:20,000)
- (2) Collection and review of data and information, and field survey on the following items.
 - a. Topography
 - b. Meteorology and Hydrology
 - c. Geology and Hydrogeology
 - d. Soil
 - e. Land use
 - f. Irrigation and drainage
 - g. Agriculture
 - h. Agriculture supporting services
 - i. Agro-economy and rural economy
 - j. Rural infrastructure
 - k. Construction materials and cost
 - l. Others
- (3) Identification of subareas with the potentials of water resource development and agriculture development

2-2 Phase II

Based on the result of Phase I study, availability of groundwater is assessed in the high potential subareas.

- (1) Selection of test well drilling sites
- (2) Test well drilling and groundwater monitoring

2-3 Phase III

Feasibility study on agriculture development plans in subarea(s) with priority is conducted as follows:

- (1) Selection of subarea(s) for the feasibility study;

- (2) Topographic mapping (1:5,000) of the selected subarea(s);
- (3) Supplemental data collection and additional field survey on the items listed in 2-1, (2) ;
- (4) Formulation of agriculture development plan(s) in the selected subarea(s) including,
 - a. Delineation of project area
 - b. Cropping pattern and farming system
 - c. Irrigation and drainage system
 - d. Rural infrastructure
 - e. Preliminary design of major structures
- (5) Recommendation of project implementation schedule
- (6) Estimate of benefits and cost
- (7) Project evaluation

IV. WORK SCHEDULE

The whole study shall be conducted in accordance with the attached tentative schedule.

V. REPORTS

JICA shall submit the following reports in English to the Government of the United Republic of Tanzania.

1. Inception report(I)

Thirty (30) copies at the commencement of the Phase I aerial photography.

2. Inception report(II)

Thirty (30) copies at the commencement of the Phase I study.

3. Progress report (I)

Thirty (30) copies at the end of the Phase I study.

4. Interim Report

Thirty (30) copies at the end of the Phase II study.



5. Progress report (II)

Thirty (30) copies at the end of the Phase III field survey.

6. Draft final report

Thirty (30) copies at the end of the Phase III study.

The Government of the United Republic of Tanzania shall provide its comments on the report within one (1) month after the receipt of the Draft Final Report

7. Final Report

Fifty (50) copies within two (2) months after the receipt of the Government of the United Republic of Tanzania's comments on the Draft Final Report.

VI. UNDERTAKING OF THE GOVERNMENT OF THE UNITED REPUBLIC OF TANZANIA

1. To facilitate a smooth conduct of the Study, the Government of the United Republic of Tanzania shall take necessary measures:

(1) To secure the safety of the Japanese study team,

(2) To permit the members of the Japanese study team to enter, leave and sojourn in the United Republic of Tanzania for the duration of their assignment therein, and exempt them from alien registration requirements and consular fees,

(3) To exempt the members of the Japanese study team from taxes, duties, fees and any other charges on equipment, machinery and other materials brought into the United Republic of Tanzania for the conduct of the Study,

(4) To exempt the members of the Japanese study team from income tax and charges of any kind imposed on or in connection with any emoluments or allowances paid to the members of the Japanese study team for their services in connection with the implementation of the study,

(5) To provide necessary facilities to the Japanese study team for the remittance as well as the utilization of funds introduced into the

United Republic of Tanzania from Japan in connection of the implementation of the Study,

- (6) To secure permission for entry into private properties or restricted areas for the conduct of the Study,
- (7) To secure permission to take all data and documents related to the Study including photographs out of the United Republic of Tanzania to Japan by the Japanese study team,
- (8) To provide medical services as needed;
Its expenses shall be chargeable on the member of the Japanese study team.

2. The Government of the United Republic of Tanzania shall bear claims, if any arises, against the members of the Japanese study team resulting from, occurring in the course of or otherwise connected with the discharge of their duties in the implementation of the Study, except when such claims arise from gross negligence or wilful misconduct on the part of the members of the Japanese study team.

3. Regional Development Directorate in Kilimanjaro Region (hereinafter referred to as "RDD") shall act as counterpart agency to the Japanese study team and also as coordinating body in relation with other governmental and non-governmental organizations concerned for smooth implementation of the Study.

4. RDD shall, at its own expense, provide the Japanese study team with the following, in cooperation with other agencies concerned:

- (1) Available data and information related to the Study,
- (2) Additional survey related to the Study, if necessary,
- (3) Counterpart personnel,
- (4) Suitable office space with necessary equipments in Moshi,

(5) Credentials or identification cards.

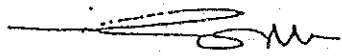
VII. UNDERTAKING OF JICA

For the implementation of the Study, JICA shall take the following measures:

1. to dispatch, at its own expense, the Study team to Tanzania,
2. to pursue technology transfer to Tanzanian counterparts in the course of the Study.

VIII. CONSULTATION

JICA and RDD shall consult with each other in respect of any matter that may arise from or in connection with the Study.



2/7

APPENDIX

TENTATIVE WORK SCHEDULE

Month in Order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
I Field Work Home office Work																											
II Field Work Home office Work																											
III Field Work Home office Work																											
REPORTS	△ Inc/R(I)		△ Inc/R(II)		△ P/R(I)													△ Int/R		△ P/R(II)		△ DFR				△ FR	

Works In Tanzania Home Office Works In Japan

Remarks:
 Inc/R(I) : Inception Report(Aerial photography) Int/R : Interim Report FR : Final Report
 Inc/R(II) : Inception Report(Feasibility study) P/R(II) : Progress Report II
 P/R(I) : Progress Report I DFR : Draft Final Report

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MINUTES OF MEETING ON THE SCOPE OF WORKS FOR THE FEASIBILITY
STUDY ON LOWER HAI AND LOWER ROMBO AGRICULTURAL DEVELOPMENT
PROJECT IN THE UNITED REPUBLIC OF TANZANIA

In response to the request of the Government of the United Republic of Tanzania, for the Feasibility study on Lower Hai and Lower Rombo Agricultural Development Project in Kilimanjaro Region, the Government of Japan dispatched, through Japan International Cooperation Agency (hereinafter referred to as "JICA") responsible for the implementation of the technical co-operation programmes of the Government of Japan, the preliminary Survey Team headed by Mr. Kanezo TAKEUCHI, to Tanzania, from 20th February to 1st March, 1988.

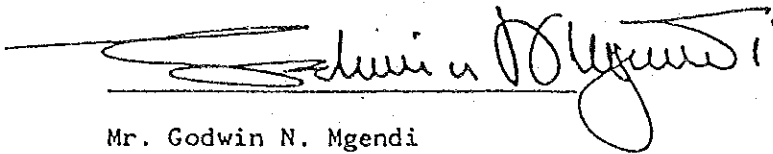
Team held a series of discussion for the Scope of Works with the Regional Development Directorate and other authorities concerned.

Followings are the results at the meeting,

1. Regarding to the paragraph 111, 2-1, (2), b, JICA will install 4 sets of water level recorder.
RDD, will carry out data collection and the daily maintenance works.
2. Regarding to the paragraph 111, 2-2,
 - (a) RDD, will at its own expense, carry out the test well drilling works.
 - (b) RDD requested that the spare parts for the drilling machine and the consumable materials etc for the test well drilling, as shown in attached papers, would be provided by JICA.
3. Regarding to the paragraph VI, RDD recommended JICA to read the sentences as follows:
 - VI, 1, (2) To permit the members of the Japanese study team to enter, leave and sojourn in the United Republic of Tanzania for the duration of their assignment therein in accordance with existing regulations.
 - VI, 1, (5) To provide necessary facilities to the Japanese study team for the remittance as well as the utilisation of funds introduced into the United Republic of Tanzania from Japan in connection with the implementation of the study as will be applicable.

4. RDD strongly requested that JICA would provide appropriate numbers of vehicles for the study.
5. RDD suggested that the training of the Tanzanian counterparts would be continuously carried out through the field work in Tanzania and home office work in Japan.

27th February, 1988, Moshi.



Mr. Godwin N. Mgendi
Regional Development Director
Kilimanjaro Region



Mr. Kanezo Takeuchi
Leader of the Preliminary
Survey Team
Japan International
Cooperation Agency

ATTACHED TABLE I

DRILLING ITEMS FOR TONE RIG MODEL "THS 70"

1. Water swivel assembly capacity 6 tone type "FH 6" with 73T drillrod pin and 50mm hose connection EA 4 pcs
2. Hoisting plug assembly type B - 4A - EA I
3. Stabilizer three wings size 3¹/₂ I.F. x 120mm diameter x 130mm EA 1.
4. Drill rod inside tape size 73T - RH (Fishing tool) EA 2
5. Drill rod outside tape size 73T - RH x RH (Fishingtool) EA 2
6. Bolt chuck E.0325 - 001 EA 6
7. Hoisting cable 3/8" x 100 metres with pin
8. Drillrodes 73mm OD x 3m External flush 60 pcs
9. Drill collar 127mm OD x 3m long weight approx. 200kg. with 3¹/₂" I.F. 60° to pin connector EA 4 pcs..
10. Subsitute to connect drillrod to drill collar or drill collar 73mm OD box to 3¹/₂" I.F. pin 3 pcs.
11. Substute to connect drill collar to stabilizer to three cutter bit 3¹/₂" I.F. (Box) to 4¹/₂" Regular EA 3 pcs.
12. Sunction hose 3" 12ft. EA. 2
13. Horse Air Size 50mm 8 metres long
14. Drill bits tricon rollerbit (for hard rock) size 12¹/₄" EA 4
15. " " " " " size 10" EA 4
16. " " " " " size 8" EA 4
17. " " " " " size 6" EA 2
18. Hydraulic Jacks 10 Ton EA 2

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2.17

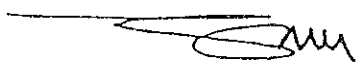
SPARE PARTS FOR DIESEL ENGINE F. 21912

FOR MUD PUMP MODEL MITSUI - DEYTS 26.5HP DIN A 6270

1. Oil filter PN 01501980 each 10 pcs
2. Fuel filter PN 02001760 10 pcs
3. Desc. Plate assey PN 04507311 each 8 pcs.
4. Air cleaner PN. 22201360 each 10 pcs
5. Self starter motor 12 Tone type No. 2
6. Starter switch assy PN 04801501 2 Nos
7. Chuck spanner each 2 Nos
8. Chuck Jews EA 10 sets (30 Nos)
9. Breaklining EA 5 sets (10 Nos)
10. Spedal meter cable (EA 2 Nos)

SPARE PART FOR MUD PUMP

1. Ruber parking PB 2702 - 080 - 50 pcs
2. Ruber piston PN E 2703 - 006 (85mm diameter) 20 pcs
3. Ruber piston PN E JISB 2403 - 425 each 200.pcs.
4. Parking PN E 2521 - 541 each 10 pcs
5. "V" belt each 4 sets (size-B.32) and size B4 (10 sets)
6. "O" ring PN JSB 2410 - P 70 - 12 pcs
7. - do - P110 - 12 pcs
8. "O" Ring O45 each 12 pcs
9. Piston rod PN d. 2841 - 059 - 20 pcs
10. "V" Belt for cooling system 20 pcs.
11. Bearings - 2 set (16 Nos).



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PARTS FOR NISSAN TRUCK TK 20 UD

1. Wind screen (glass front window) Key 28
PN. 72613 - Z3000 EA 1.
2. Weather strip (rubber) 27, PN.72610 - 92000 EA one
3. Wood Assy top 60. PN.72610 - 92001 EA one
4. Cushion Assy seal PN. 86004 Z9001 EA one
5. Cushion Assistant Seat PN 86300 Z 3000 EA one
6. Batteries 21 plates 12 volts EA 2
7. Voltage regulator 24 Volts EA one
8. Battery relay switch Assy PN.25613 - 90008 EA one
9. Hanes Spdd Indicator Lamp Key 41 PN.24009 Z3000 EA 1
10. Hanes Assy Magnetic valve Key 5 PN.24015 Z 4001 EA 1
11. King Pln PN. 40563 - 90009.

ADDITIONAL REQUIREMENTS

1. Consumable Material:
 - a. Bentonite
 - b. Fuel (diesel)
 - c. Hydraulic oil
 - d. Lubricants
2.
 - a. Submessible pump for pump test
 - b. Generator set



MINUTES OF INCEPTION MEETING ON THE FEASIBILITY STUDY ON
LOWER HAI AND LOWER ROMBO AGRICULTURAL DEVELOPMENT PROJECT

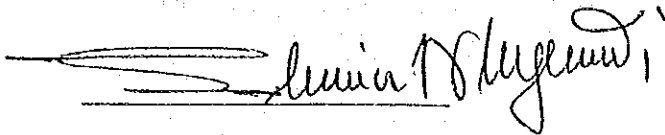
In accordance with the Scope of Works for the Feasibility Study on Lower Hai and Lower Rombo Agricultural Development Project in the United Republic of Tanzania agreed upon between Japan International Cooperation Agency (JICA) and the Regional Development Directorate (RDD), Kilimanjaro Region on 27th February, 1988, JICA dispatched the feasibility Study team in November 1988. Based on Inception Report submitted to the Government of Tanzania by the Study Team, a series of discussion for the basic approach to the study, plan of operation and work schedule was held between the Study Team and RDD and other authorities concerned.

The following major items were discussed and confirmed.

1. The Inception Report submitted by the Team was satisfactorily accepted by the RDD.
2. RDD will dispatch engineers in charge of the rig to Dar es Salaam for delivery checking of equipment, materials and spare parts supplied by JICA when those goods arrive from Japan.
3. RDD accepted to make all necessary preparations for overhaul of drilling equipment by the time when JICA dispatch a mechanic for drilling machine after the deliver of spare parts.
4. JICA will provide the spare parts of drilling machine and materials, which will be delivered by the end of November, 1988.
5. RDD strongly requested that JICA would further provide necessary materials and spare parts if needed, required for effective execution of the project.

6. RDD and Study Team confirmed that one test well drilling work shall be at least completed by the beginning of March 1989 by RDD so that its ground water tests will be carried out in presence of JICA hydro-geologist.

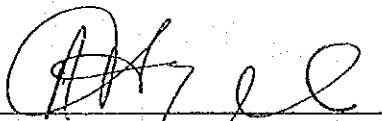
9th November 1988



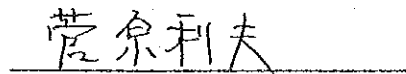
Mr. Godwin N. Mgendi
Regional Development Director
Kilimanjaro Region.



Mr. Shin-ichi Yano
Team Leader
Feasibility Study Team
Japan International
Cooperation Agency.



C.P.A. Nyangala
Director,
KADP - Construction &
Development.



Dr. Toshio Sugahara
Leader of Advisory Mission
Japan International
Cooperation Agency.

MINUTES OF MEETING
ON
THE FEASIBILITY STUDY
ON
LOWER HAI AND LOWER ROMBO AGRICULTURAL DEVELOPMENT PROJECT

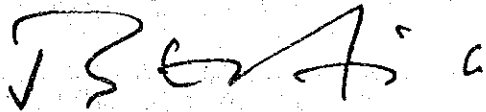
Date : October 14, 1989
Place : Office of Regional Planning Officer
Attendances : See List of Attendances

The Feasibility Study Team for the Lower Hai and Lower Rombo Agricultural Development Project and the Advisory Team dispatched by Japan International Cooperation Agency (JICA) and the Regional Development Director (RDD), Kilimanjaro Region held a series of discussion and exchanged views on the Interim Report to be prepared by the end of December 1989 for the Lower Hai and Lower Rombo Agricultural Development Project.

The following were observed and confirmed:

- 1) As the results of hydrogeological investigation so far carried out, the ample groundwater is obtainable in the Lower Hai area while negligible groundwater from the shallow wells is available in the Lower Rombo area.
- 2) There exist four (4) perennial surface river flows in the Lower Hai area, most of which are utilized for irrigation in respective river basin. Water balance between the existing water rights and the river flows will be carefully studied. In the Lower Rombo area, one perennial flow of the Lume river is available. The substantial amount of this river flow is utilized for irrigation in Ikuini scheme under rehabilitation of FAO along the lower Lume basin.
- 3) From the viewpoints of both surface and groundwater availability, land capability, agronomy and agro- and socio-economy, several agricultural development schemes will be identified in the Lower Hai area. On the other hand, economical irrigated agricultural development in the Lower Rombo area is hardly possible in view of negligible groundwater availability from the shallow wells and surface water availability in the rivers.
- 4) Apart from the present study, RDD expressed the needs of study on rural water supply system as a future development project in the Rombo District.

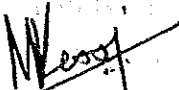
- 5) Topographic mapping using aerial photographs mentioned in the Scope of Works for the feasibility study will be carried out for selected agricultural development areas in the Lower Hai area.
- 6) RDD accepted to carry out supplementary geo-electrical prospecting in the Lower Hai area where ample groundwater potentials were identified through the groundwater test carried out from March to September 1989. The results of electrical prospecting shall be forwarded to JICA Study Team by the end of November 1989 for the study on the available groundwater resources and the preliminary design of production wells. RDD requested JICA to provide further necessary materials and spare parts if needed for the effective execution of above study.



 Mr. JULIUS SEMWAIKO
 Regional Development Director,
 Kilimanjaro Region



 Mr. SHINICHI YANO
 Team Leader,
 JICA Feasibility Study Team



for -----
 Mr. C. P. A. NYANGALA
 Director,
 Construction and Development
 Project (KADP)



 Dr. TOSHIO SUGAHARA
 Team Leader,
 JICA Advisory Team

LIST OF ATTENDANCES

Name	Position
Mr. A. J. LWELAMILA	Acting Regional Development Director/ Regional Planning Officer
Mr. E. A. MATOWO	Regional Irrigation Officer
Mr. R. L. DALUTI	Acting Zonal Irrigation Engineer
Mr. B. M. H. LUSEWA	Acting Regional Agriculture and Livestock Development Officer
Mr. E. J. DAMBALL	Regional Water Engineer
Mrs. R. J. BENNE	Planning and Control Officer
Mr. M. E. KESSI	Acting Director, Construction and Development Project (KADP)
Mr. M. WAKABAYASHI	Team Leader, Kilimanjaro Agricultural Development Project (KADP)
Mr. T. YANAGIDA	Irrigation Engineer, Kilimanjaro Agricultural Development Project (KADP)
Dr. T. SUGAHARA	Team Leader, JICA Advisory Team
Mr. Y. NISHIKAWA	Coordinator, JICA Advisory Team
Mr. S. YANO	Team Leader, JICA Feasibility Study Team
Mr. H. MATSUURA	Irrigation and Drainage Engineer, JICA Feasibility Study Team
Mr. Y. SEKIGUCHI	Agronomist, JICA Feasibility Study Team

MINUTES OF MEETING

ON

THE FEASIBILITY STUDY

ON

LOWER HAI AND LOWER ROMBO AGRICULTURAL DEVELOPMENT PROJECT

Date : September 3, 1990
Place : Office of Regional Development Director
Attendance : See List of Attendance

The Feasibility Study Team for the Lower Hai and Lower Rombo Agricultural Development Project and the Advisory Team dispatched by Japan International Cooperation Agency (JICA) held a series of discussion and exchanged views on the Draft Final Feasibility Report with the Regional Development Director (RDD) in Kilimanjaro Region and authorities concerned.

Both sides agreed in principle with the Draft Final Feasibility Report prepared by the JICA Study Team. RDD promised to forward its comments on the Draft Final Report within one (1) month through JICA Tanzania Office in Dar es Salaam.

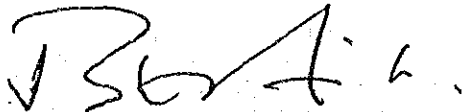
JICA Study Team will proceed to prepare the (Final) Feasibility Report based on the comments and will submit the Report within two (2) months after the receipt of the comments.

RDD appreciated the provision of following equipment and spare parts by JICA for the study and requested to be handed over to RDD.

- (1) One (1) unit of five (5) ton cargo truck with three (3) ton cab back crane (model: CMA81FHR) and standard accessories, and spare parts for above,
- (2) One (1) lot of spare parts and equipment for the existing (supplied in 1976) one model: "THS" truck mounted drilling rig, and
- (3) One (1) set of vertical water level recorders.

RDD expressed the desire for early implementation of the Project through technical and financial assistance from the Government of Japan.

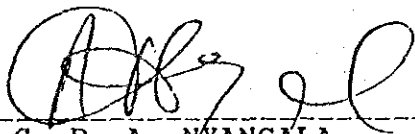
Following the negative results to develop agriculture in Lower Rombo through irrigation, RDD expressed the desire to conduct early study on domestic water supply through technical and financial assistance from the Government of Japan.



Mr. JULIUS SEMWAIKO
Regional Development Director,
Kilimanjaro Region



Mr. SHINICHI YANO
Team Leader,
JICA Feasibility Study Team



Mr. C. P. A. NYANGALA
Director,
Construction and Development
Project (KADP)



Mr. TAKASHI TACHIBANA
Team Leader,
JICA Advisory Team

LIST OF ATTENDANCE

Name	Position
Mr. J. SEMWAIKO	Regional Development Director
Mr. A. J. LWELAMILA	Regional Planning Officer
Mr. C. P. A. NYANGALA	Director, Construction and Development Project (KADP)
Mr. C. K. CHIZA	Zonal Irrigation Engineer, Zonal Irrigation Unit (ZIU)
Mr. P. J. SHAYO	Assistant Executive Engineer, ZIU
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