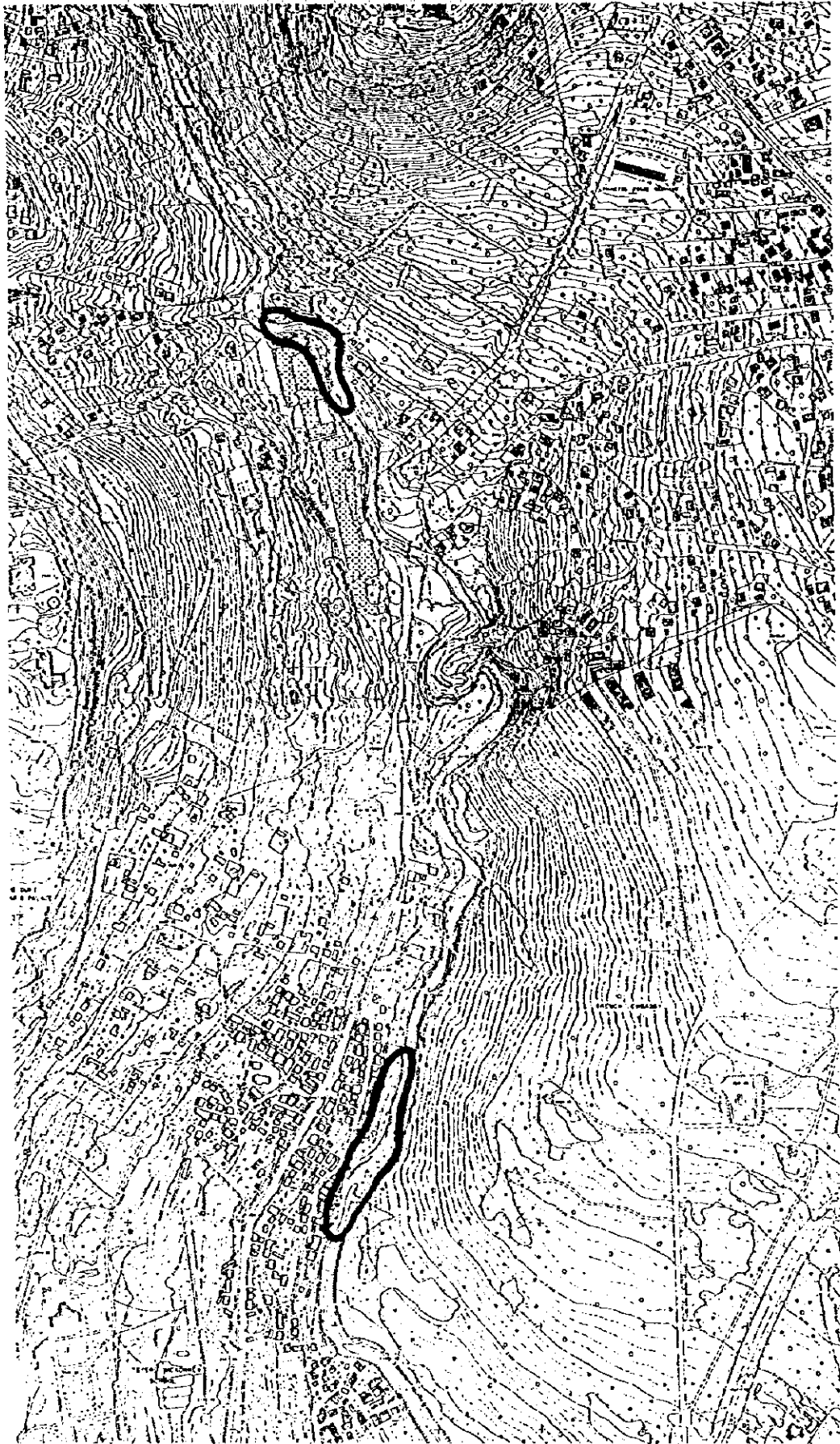
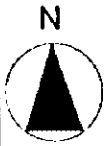


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JAPAN INTERNATIONAL COOPERATION AGENCY REGION 14 ADMINISTRATION
DRAWING NO. KEB-PLAN-08

### Map of Flooding Area - Kebena River (8/9)



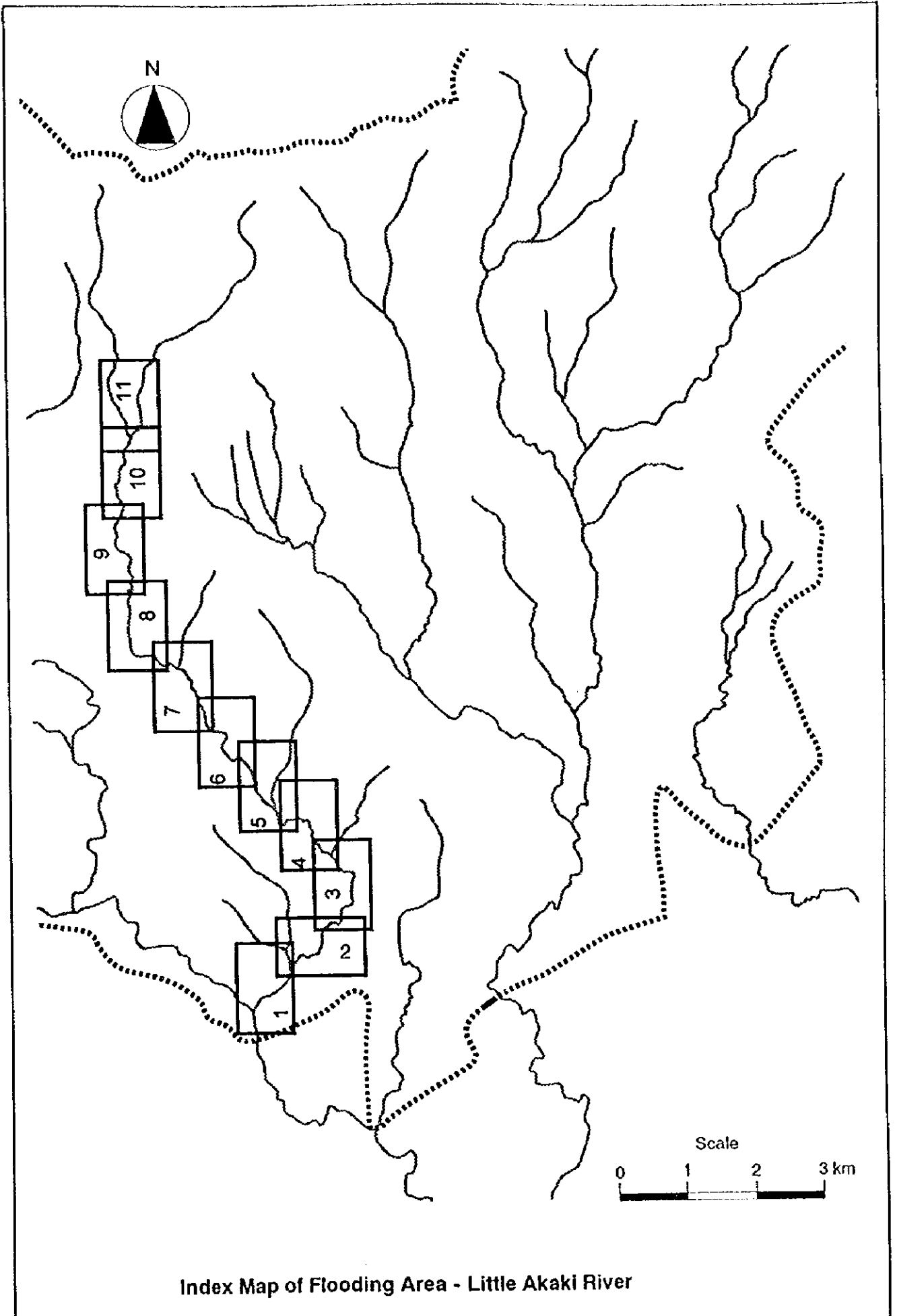


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IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
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REGION 11 ADMINISTRATION

DRAWING NO.  
KEB-PLAN-09

### Map of Flooding Area - Kebena River (9/9)





Index Map of Flooding Area - Little Akaki River

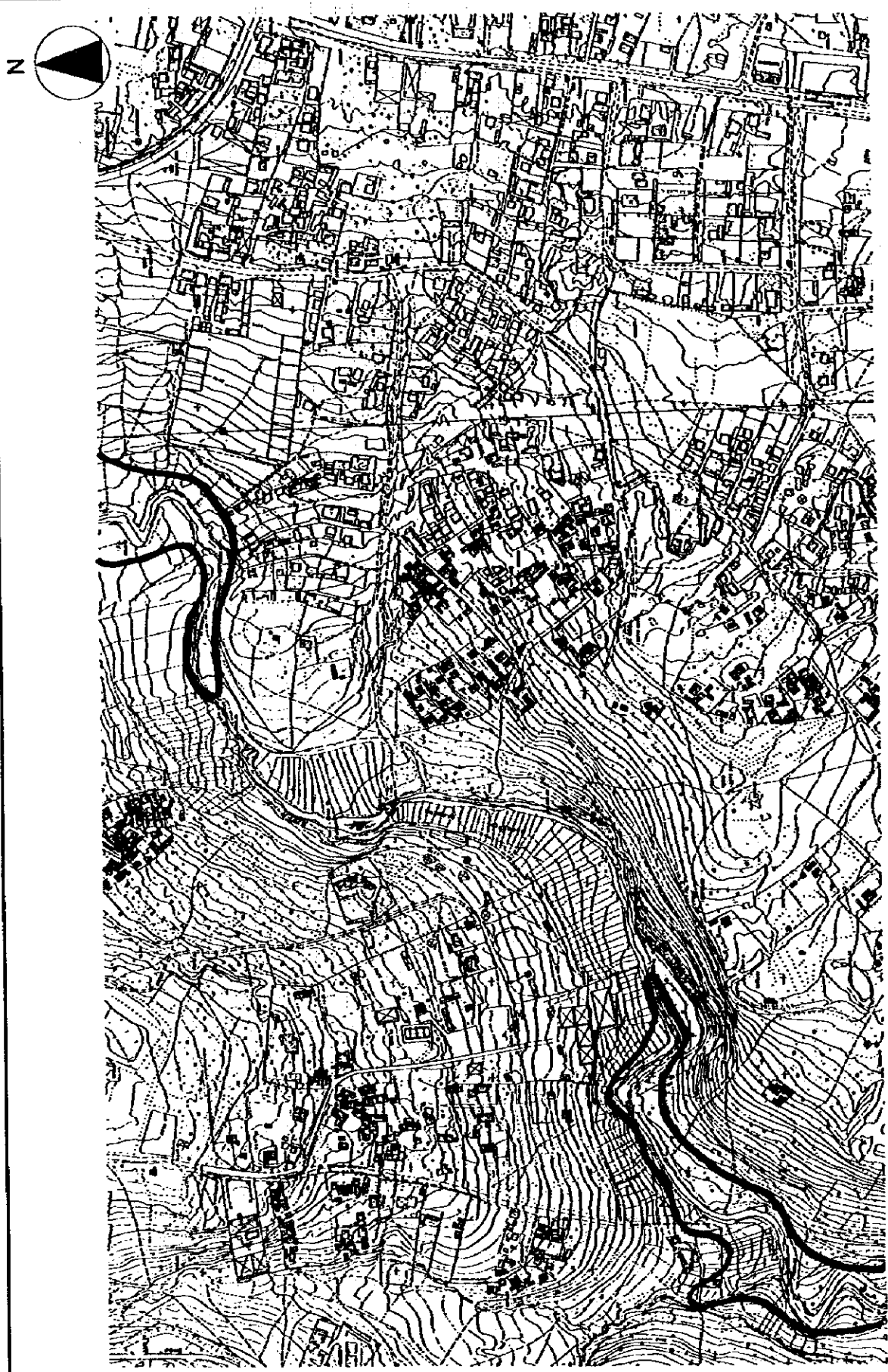


THE STUDY ON ADDIS ABABA FLOOD CONTROL PROJECT  
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JAPAN INTERNATIONAL COOPERATION AGENCY  
REGIONAL ADMINISTRATION

DRAWING NO.  
LAK-PLAN-01

Map of Flooding Area - Little Akaki River (1/11)



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DRAWING NO.  
LAK-PLAN-02

Map of Flooding Area - Little Akaki River (2/11)

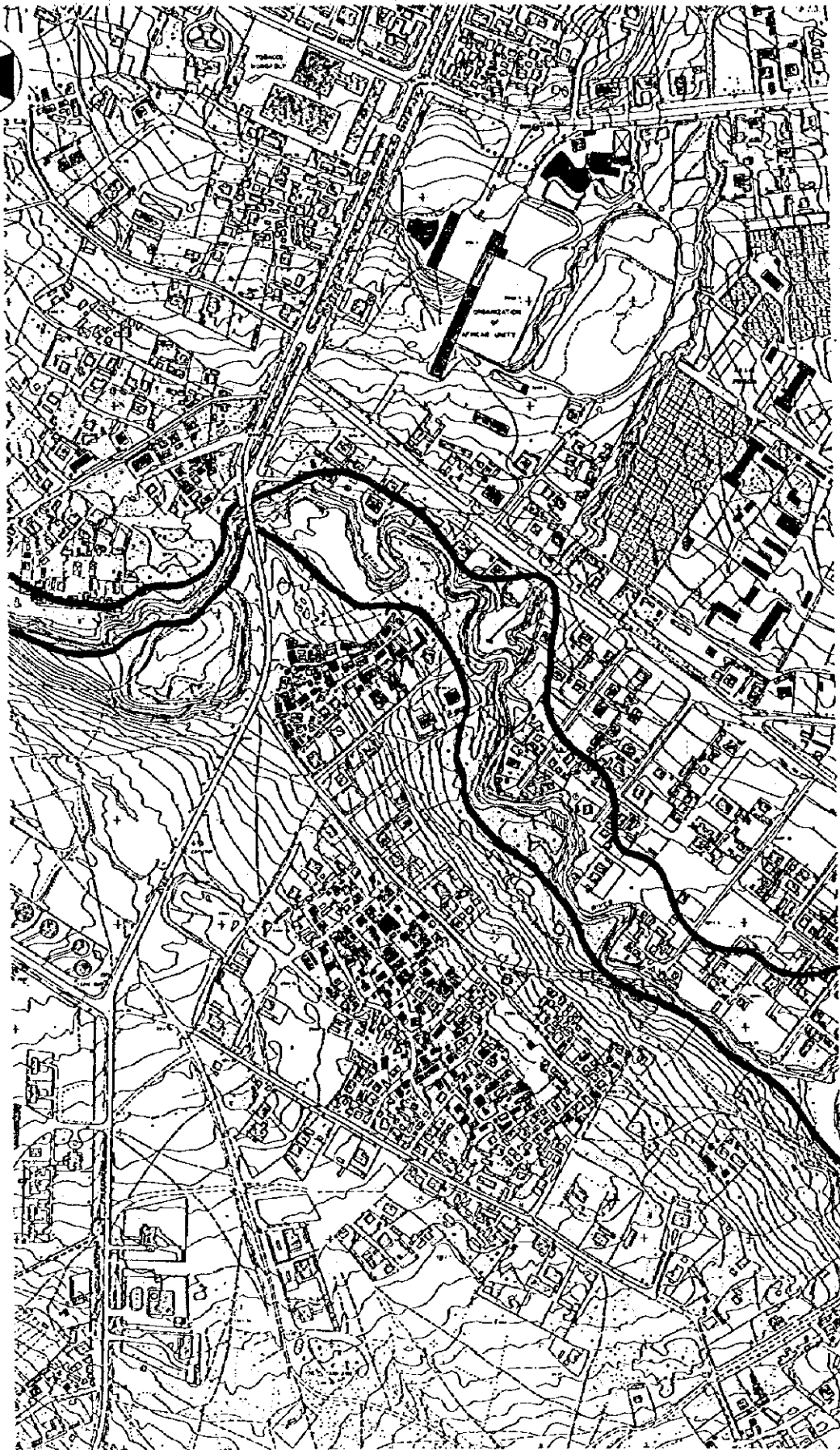


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JAPAN INTERNATIONAL COOPERATION AGENCY  
REGION 14 ADMINISTRATION

DRAWING NO.  
LAK-PLAN-03

Map of Flooding Area - Little Akaki River (3/11)

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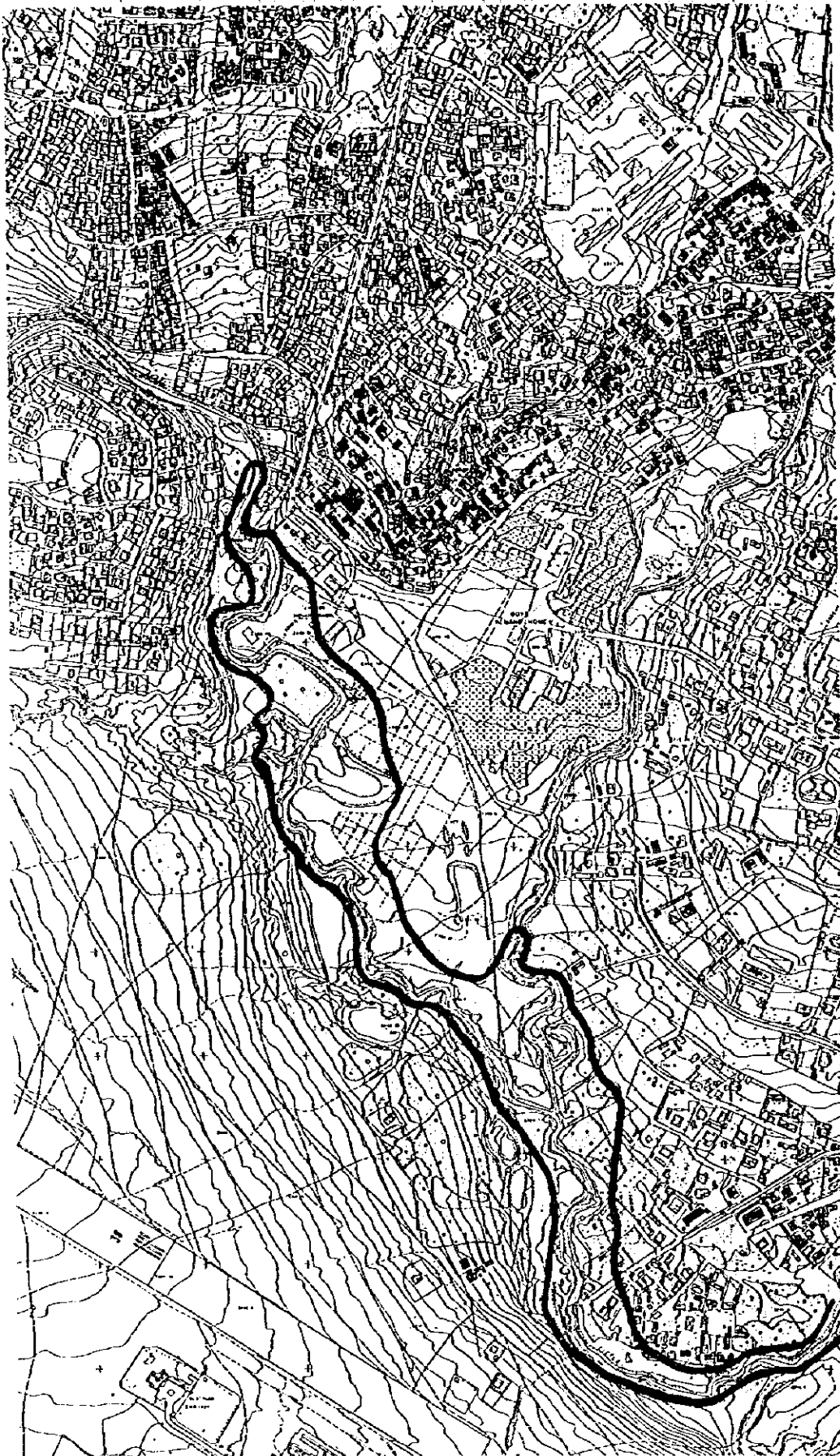
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JAPAN INTERNATIONAL COOPERATION AGENCY  
RECTOR'S ADMINISTRATION

DRAWING NO.

LAC-PLAN-004

### Map of Flooding Area - Little Akaki River (4/11)

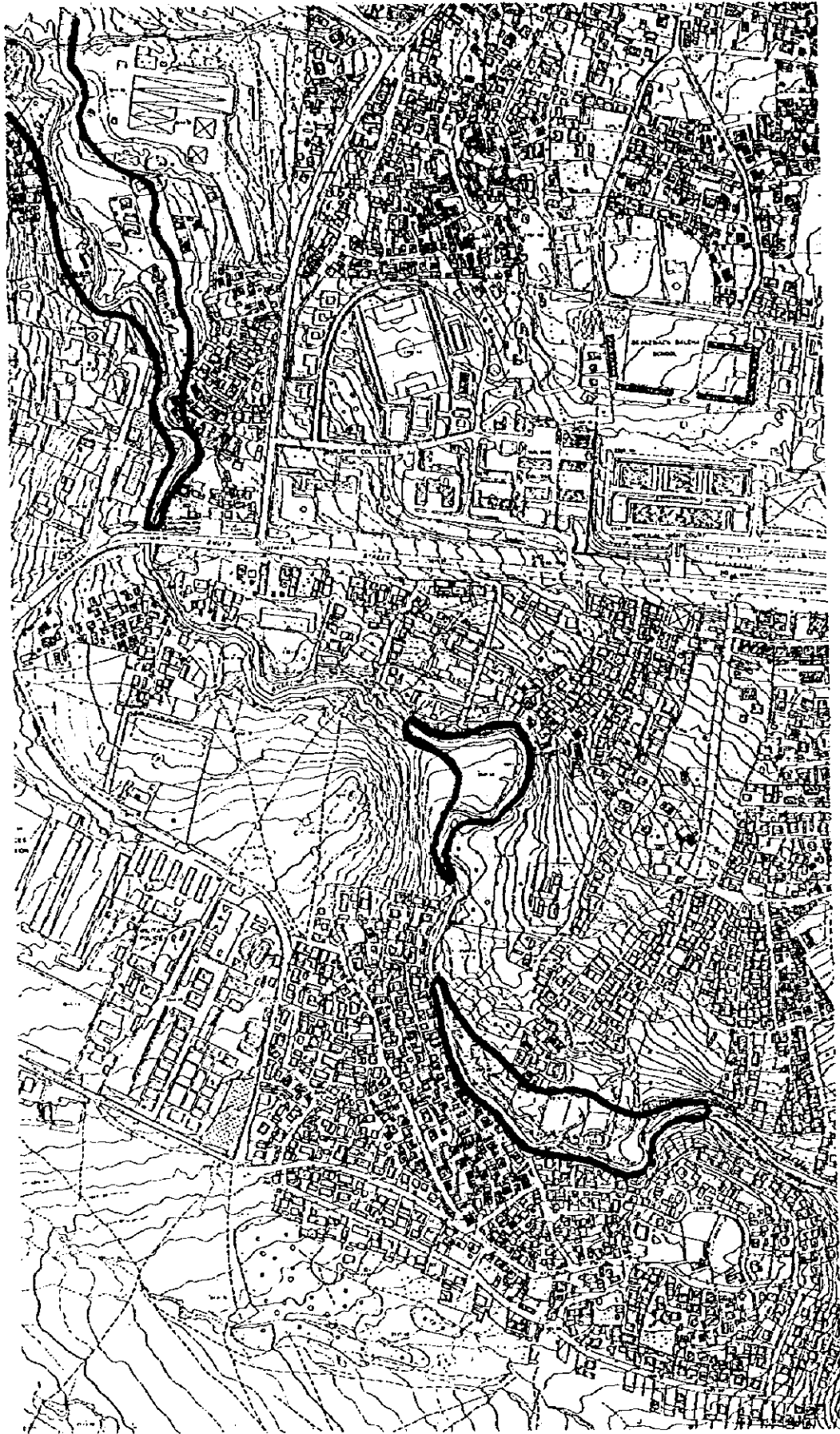


THE STUDY ON ADDIS ABABA FLOOD CONTROL PROJECT  
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JAPAN INTERNATIONAL COOPERATION AGENCY  
REGION 14 ADMINISTRATION

DRAWING NO.  
LAK-PLAN-05

Map of Flooding Area - Little Akaki River (5/11)

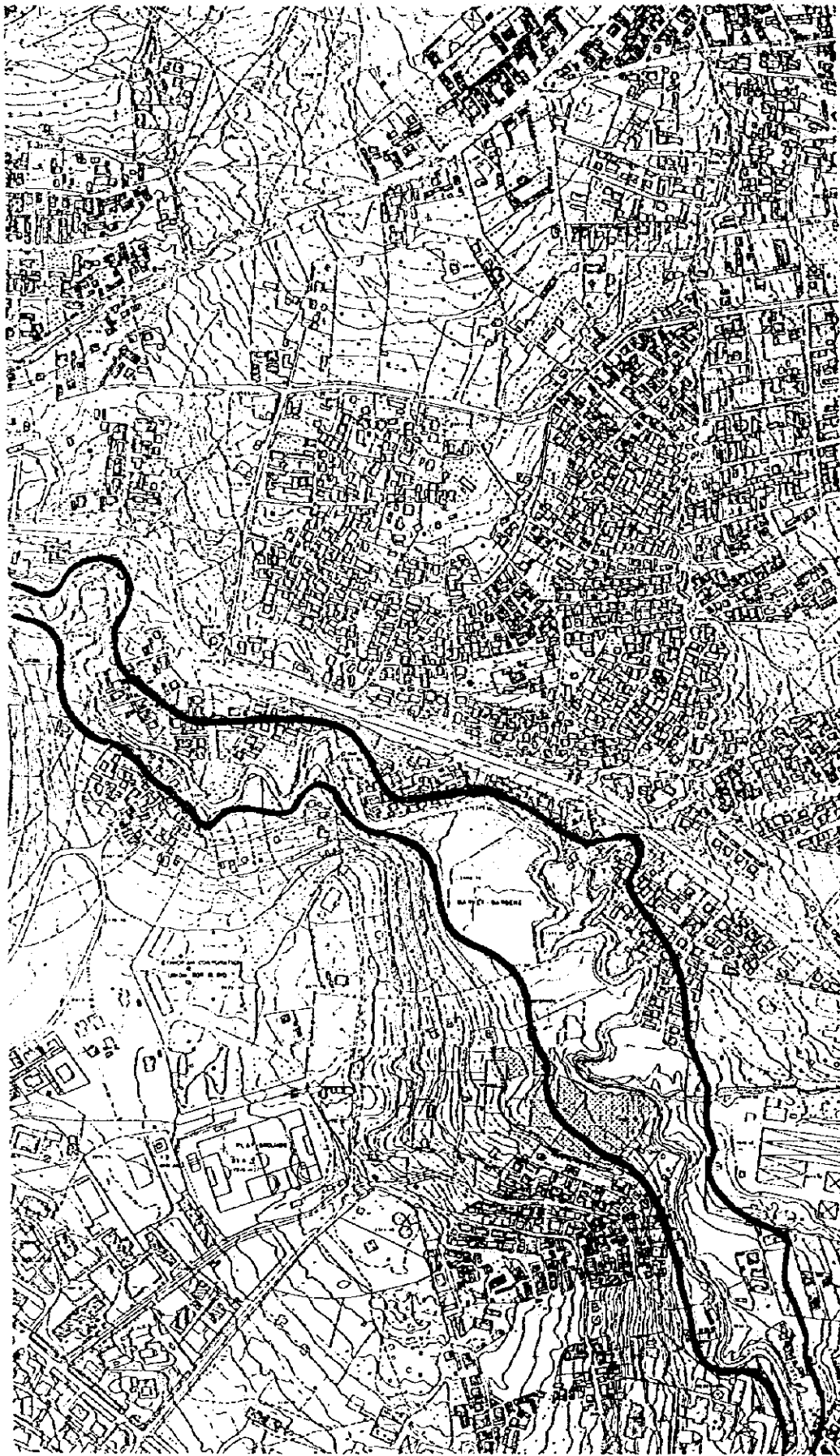




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IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
JAPANESE INTERNATIONAL COOPERATION AGENCY  
REGIONAL ADMINISTRATION

DRAWING NO.  
LAK-PLAN-06

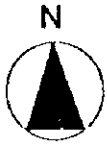
Map of Flooding Area - Little Akaki River (6/11)



THE STUDY ON ADOPTING FLOOD CONTROL PROJECT  
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
JAPAN INTERNATIONAL COOPERATION AGENCY  
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DRAWING NO.  
LAK-PLAN-07

Map of Flooding Area - Little Akaki River (7/11)



THE STUDY ON ADDIS ABABA FLOOD CONTROL PROJECT  
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
JAPAN INTERNATIONAL COOPERATION AGENCY  
REGION 14 ADMINISTRATION

DRAWING NO.  
LAK-PLAN-08

Map of Flooding Area - Little Akaki River (8/11)



THE STUDY ON ADOSS ABABA FLOOD CONTROL PROJECT  
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
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LAK-PLAN-09

### Map of Flooding Area - Little Akaki River (9/11)



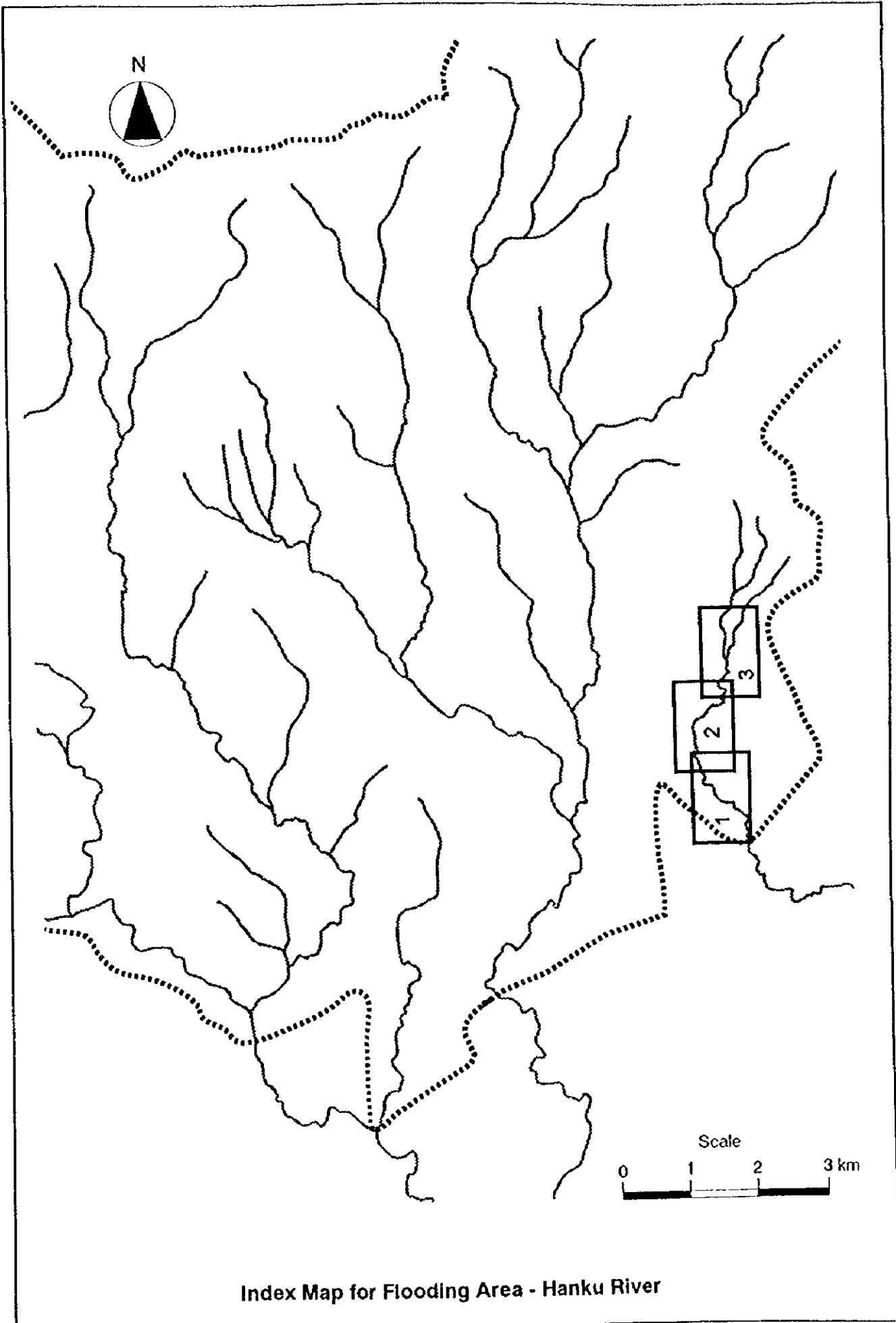
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REGIONAL ADMINISTRATION  
DRAWING NO.  
LAKPLAN-10

Map of Flooding Area - Little Akaki River (10/11)

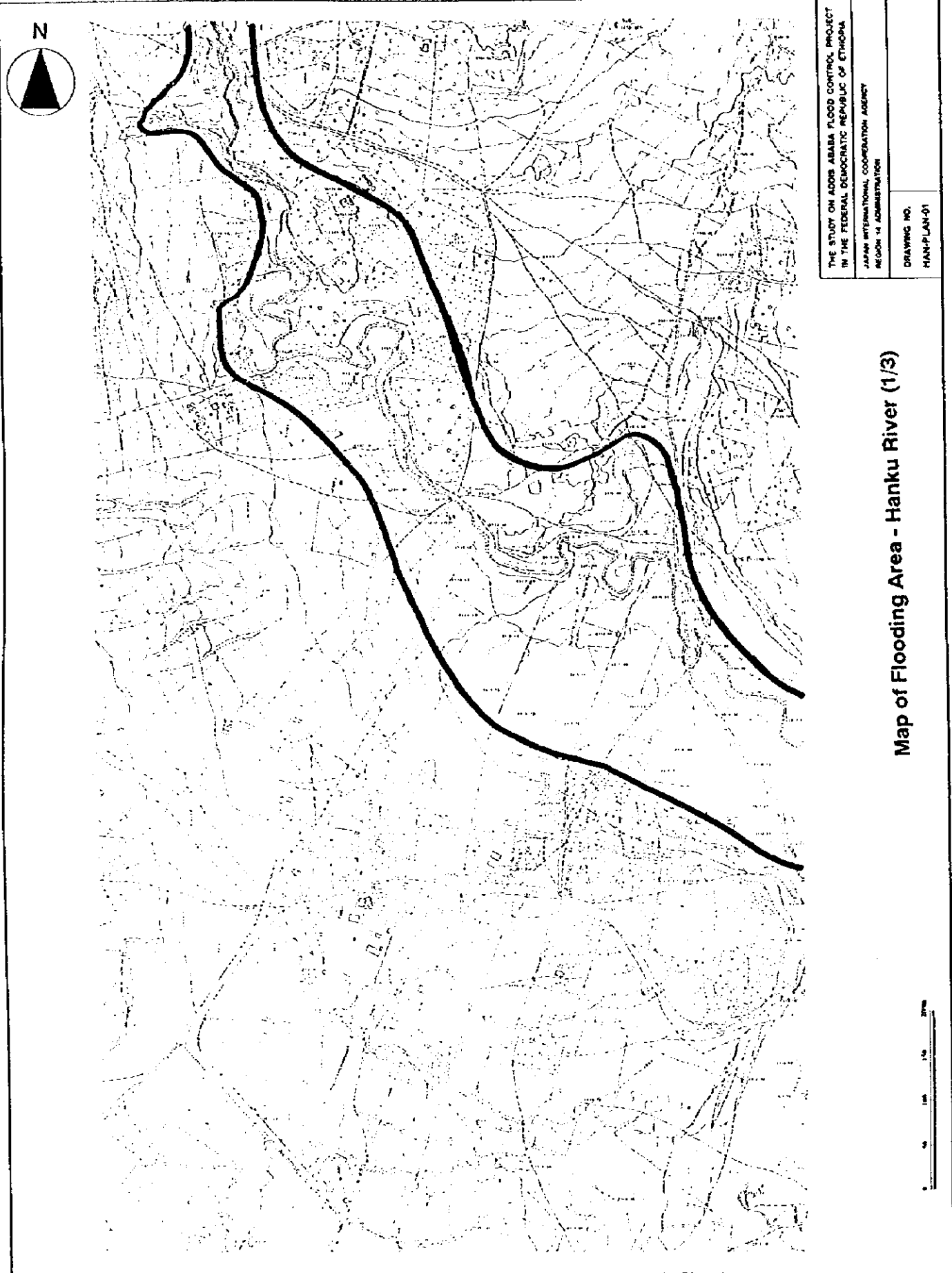


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REGION 15 ADMINISTRATION  
DRAWING NO.  
LAR-PLAN-11

Map of Flooding Area - Little Akaki River (11/11)



Index Map for Flooding Area - Hanku River



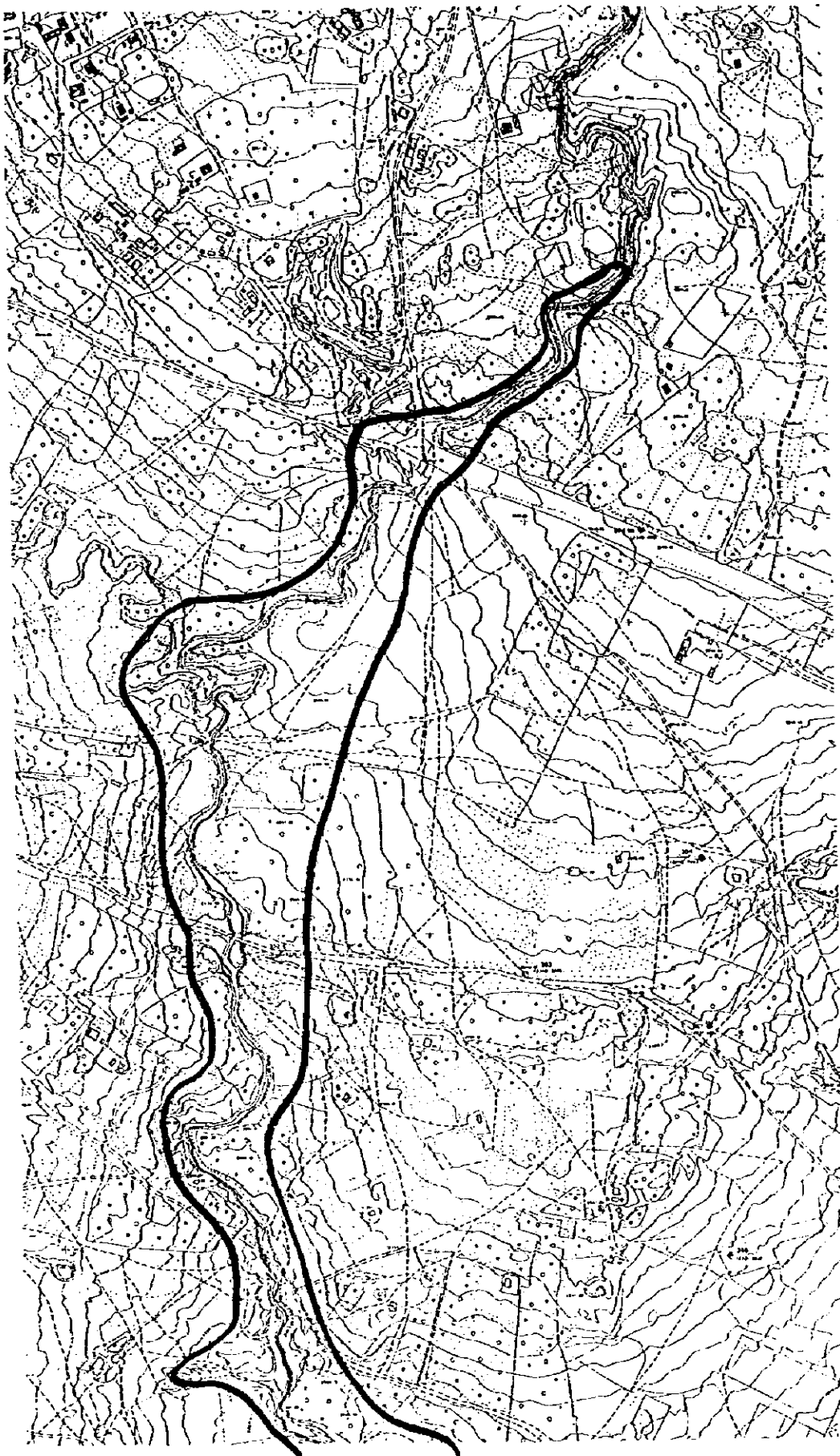
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JAPAN INTERNATIONAL COOPERATION AGENCY  
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DRAWING NO.  
 HAN-PLAN-01

Map of Flooding Area - Hanku River (1/3)

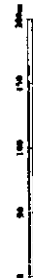
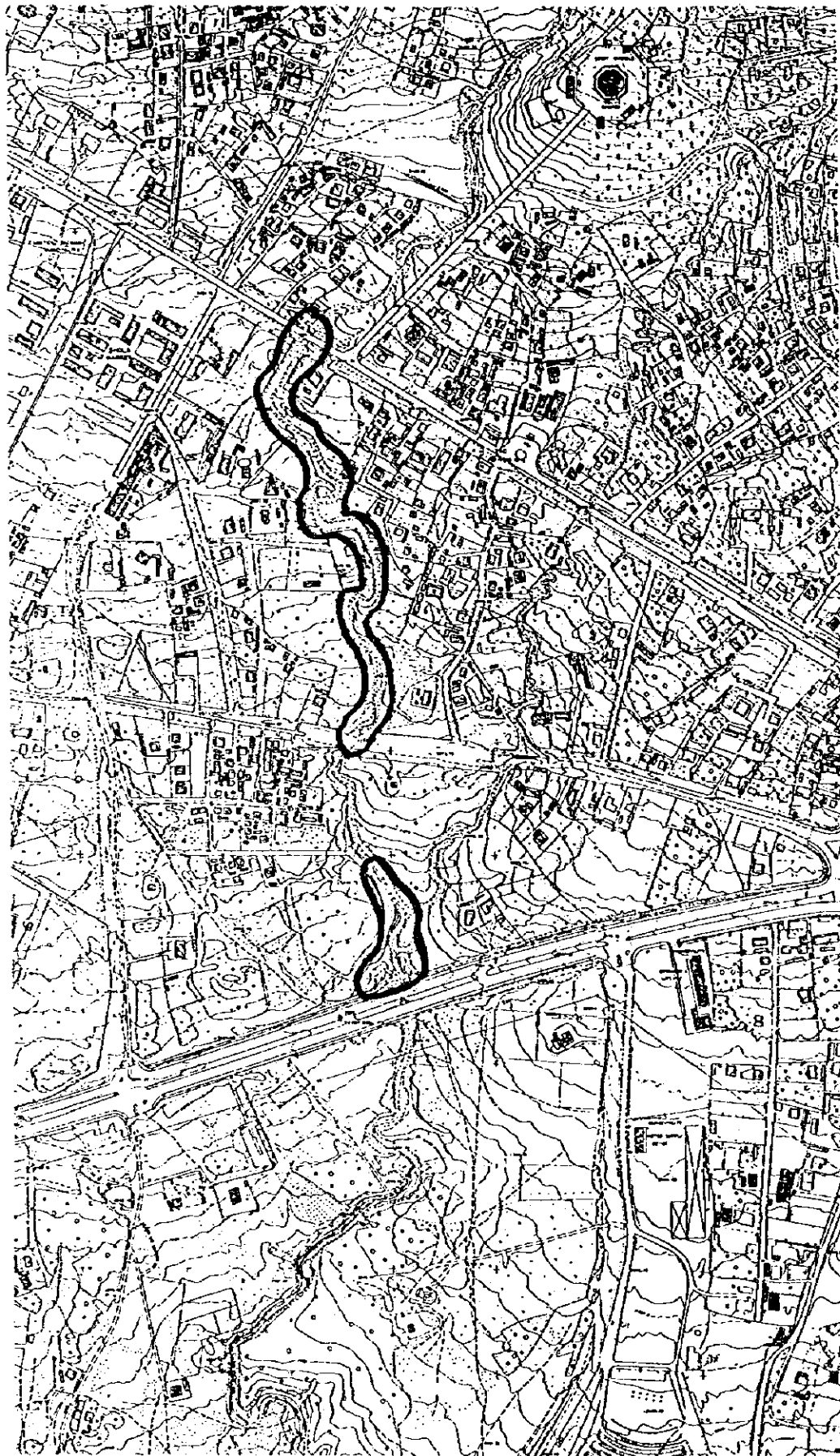




THE STUDY ON ADDIS ABABA FLOOD CONTROL PROJECT  
IN THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
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REGION 12 ADMINISTRATION

DRAWING NO.  
HAN-PLAN-02

Map of Flooding Area - Hanku River (2/3)



THE STUDY ON ADDIS ABABA FLOOD CONTROL PROJECT  
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JAPAN INTERNATIONAL COOPERATION AGENCY  
REGIONAL ADMINISTRATION

DRAWING NO.  
HAN-PLAN-03

### Map of Flooding Area - Hanku River (3/3)

**THE STUDY ON ADDIS ABABA  
FLOOD CONTROL PROJECT**

**CHAPTER 7**

**STUDY ON FUTURE  
LAND USE AND  
URBAN  
DEVELOPMENT**

**THE STUDY  
ON  
ADDIS ABABA FLOOD CONTROL PROJECT  
IN  
THE FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA**

**CHAPTER 7   STUDU ON FUTURE LANDUSE AND  
URBAN DEVELOPMENT**

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## **7. STUDY ON FUTURE LAND USE AND URBAN DEVELOPMENT**

### **7.1 General**

The basic objectives of the study on future land use and urban development are to prepare the basic material for determination of future run-off conditions in the basin and the economic situation to formulate a flood control master plan of Addis Ababa.

### **7.2 Previous Plans**

#### **7.2.1 Previous Plans**

Master plans of the city of Addis Ababa were prepared in the past several times by different agencies as follows:

- 1) The Italian Plan by Guidi & Valle (1934 – 1945)
- 2) The British & French plans by Sir Abercrombie and B.Menessy (1946 – 1959)
- 3) De La Marien Master Plan (1960 – 1975)
- 4) Polony Mater Plan (1975 – 1984)
- 5) Addis Ababa Master Plan ( - 1986)

The Addis Ababa Master Plan study was conducted in consideration of all the studies conducted before the study. This study is the latest study on the master plan study on the city of Addis Ababa as of June 1997.

#### **7.2.2 Addis Ababa Master Plan**

##### **(1) General**

The study was conducted in consideration not only of the total population projection of the Addis Ababa in the target year of 2006, but also of all the functions of the capital city of Ethiopia covering the urban-regional socio-economic and physical relations.

## (2) Planning Region

The planning region of the study included Shoa and Arsi administrative regions (Kifle Hager) with fourteen provinces (Arwaja) as of 1986. The planning region is divided into urban and rural areas, and the urban area is divided into the core area and the town area, and the core area is further divided into the area of Addis Ababa and Akaki + Kotebe as shown below:

Plannig Region					
Urban Area			Rural Area		
Core Area		Level 1 Towns	Level 2 Towns	Rural M.P.R.	Rural P.R.
Addis Ababa	Akaki and Kotebe				

The location of the area of Addis Ababa in the study is shown as old Addis Ababa in Figure 7.2.1.

## (3) Population Projection

The total population projection in the planning region in the period of 1986 to 2006 is presented by the study as follows:

Year	Population		
	Urban Area	Rural Area	Total
1986	2,497,628	8,787,417	11,285,045
1991	2,983,640	9,886,816	12,870,456
2006	5,563,788	15,814,009	21,377,797

Out of the above, the population projection of Addis Ababa is given by the study as follows:

Year	Population of Addis Ababa
1986	1,508,950
1991	1,832,340
1996	2,204,013
2001	2,593,439
2006	3,020,163

#### (4) Land Use

Land use master plan was elaborately prepared breaking down the land use into various sectors uses. The land use master plan related to the present Study Area is shown in Figure 7.2.2.

### 7.3 Study on Future Land Use and Urban Development

#### 7.3.1 Area

The present Study Area covers most area of Addis Ababa municipality as of 1984 and some part of the rural area of Orimia region. The Addis Ababa Master Plan study covers some part of the present Study Area and some part outside of the present Study Area. The area of Addis Ababa municipality was greatly expanded in 1991 from the area in 1984. The locations of these areas are shown in Figure 7.2.1 to make clear the discussion hereunder about population projection.

#### 7.3.2 Population Projection

The national population census was conducted in 1978, 1984 and 1994 in the past. According to the census, the populations of Addis Ababa were as follows:

Year	Population of Addis Ababa	Population of Addis Ababa (Area as of 1984)
1978	1,192,500	1,192,500
1984	1,423,111	1,423,111
1994	2,112,737	2,000,321

The population of Addis Ababa in 1994, as discussed in the previous section on socio-economics, was that of the area comprising the area in 1984 and additional area of zone 6 and farmers association area. The population of Addis Ababa in 1994 in the area corresponding with that of 1984 was 2,000,321.

The population growth rate between 1984 and 1994 in the area of Addis Ababa as of 1984 was 3.46 %. By using the growth rate, population projection in the said area starting from 1984 is estimated and is shown below together with those of the Addis Ababa Master Plan study and census results.

Year	Census Result	Addis Ababa M/P	Population Projection by Census Rate
1984	1,423,111		1,423,111
1986		1,508,950	1,523,394
1991		1,832,340	1,805,702
1994	1,724,051		1,999,694
1996		2,204,013	2,140,467
2001		2,593,439	2,537,294
2006		3,020,163	3,007,691

The above results are shown in Figure 7.3.1. As can be seen in Figure 7.3.1, the population projection by the Addis Ababa Master Plan conducted in 1986 seems to be in conformity with the national census result in 1994 and the population projection by using the growth rate of 3.46%.

Accordingly, it is concluded that the population projection in Addis Ababa in the Study Area can be conducted by using the growth rate of 3.46% up to 2020.

### 7.3.3 Population Projection in Study Area

As can be seen in Figure 7.2.1, the Study Area comprises the Addis Ababa as urban area and rural area included in the Oromia region. Accordingly the population projection in the Study Area is conducted by dividing the whole area into urban and rural areas.

#### (1) Population Projection in Urban Area

Regarding the population projection in the urban area, the growth rate of 3.46% is to be used as mentioned above. As can be seen in Figure 7.2.1, the Addis Ababa extends over the Study Area. Accordingly, the population projection in the urban area is conducted starting the population in the corresponding urban area in Addis Ababa, which was estimated at 1,724,511 in 1994.

#### (2) Population Projection in Rural Area

On the other hand, the population projection in the rural area is conducted based on the growth rate of 2.94%. This is the average growth rate used in the Addis Ababa Master Plan in due consideration of the projection conformity in urban area and the data availability on population in rural area in the past.



The population projection in the rural area is conducted starting in 1994. But since the population data in rural area even in 1994 is not available, the population in the rural area is estimated by multiplying the population density in rural area in the present Addis Ababa area and the rural area in the Study Area. The estimated population in the rural area in the Study Area as of 1994 is 16,046 persons by using the estimated population density in rural area of 113 persons in 1 km<sup>2</sup>, and the rural area in the Study Area of 142 km<sup>2</sup>.

The population projection in the Study Area thus conducted is shown below and Figure 7.3.2.

Year	Urban	Rural	Total
1994	1,724,511	16,046	1,740,557
1996	1,845,912	17,003	1,862,915
2001	2,188,131	19,654	2,207,785
2006	2,593,795	22,718	2,616,513
2011	3,074,667	26,260	3,100,927
2016	3,644,688	30,354	3,675,043
2020	4,320,388	35,086	4,355,475

#### 7.3.4 Land Use Plan

As mentioned in the previous section, the upstream basins of the Hanku, Kebena and Little Akaki rivers are to be preserved as the forest area according to the Addis Ababa Master Plan. Though some portions of the basins are presently covered by grassland or cultivated area, it is estimated that the whole area will be covered with forest of not only the eucalyptus but also various indigenous species in consideration of the reforestation activities mentioned in the section 4.6.

On the other hand, the present urban area is already adjacent to the present and future forest area on the north and the east. According to the Addis Ababa Master Plan, the future urban area is to be expanded to the west and the south. The expansion of the urban area including industrial and commercial area to the south is going to exceed the Study Area.

Addis Ababa Ring Road is now under planning. The plan alignment is nearly adjacent to the present urban area on the west. According to the Addis Ababa Master Plan, the

urban area expansion is to exceed the alignment of the ring road by about 2 to 3 km to the west.

The urban area expansion of Addis Ababa to the west to the target year of 2020 seems to be limited to the urban area in the west of Addis Ababa Master Plan in due consideration of the topography and the ring road plan. The western area in the Study Area exceeding the urban zone in Addis Ababa Master Plan accordingly will remain to be forest area and cultivated area with dotted resettlement.

The trunk road for commercial and industrial economic activities extending to the south leads the main seaport for the country located in Djibouti. Topography to the south is relatively flat. In this regards, the urban area expansion to the south to the target year of 2020 seems to be going on in due consideration that

With those considerations, the future land use is estimated as shown in Figure 7.3.3.

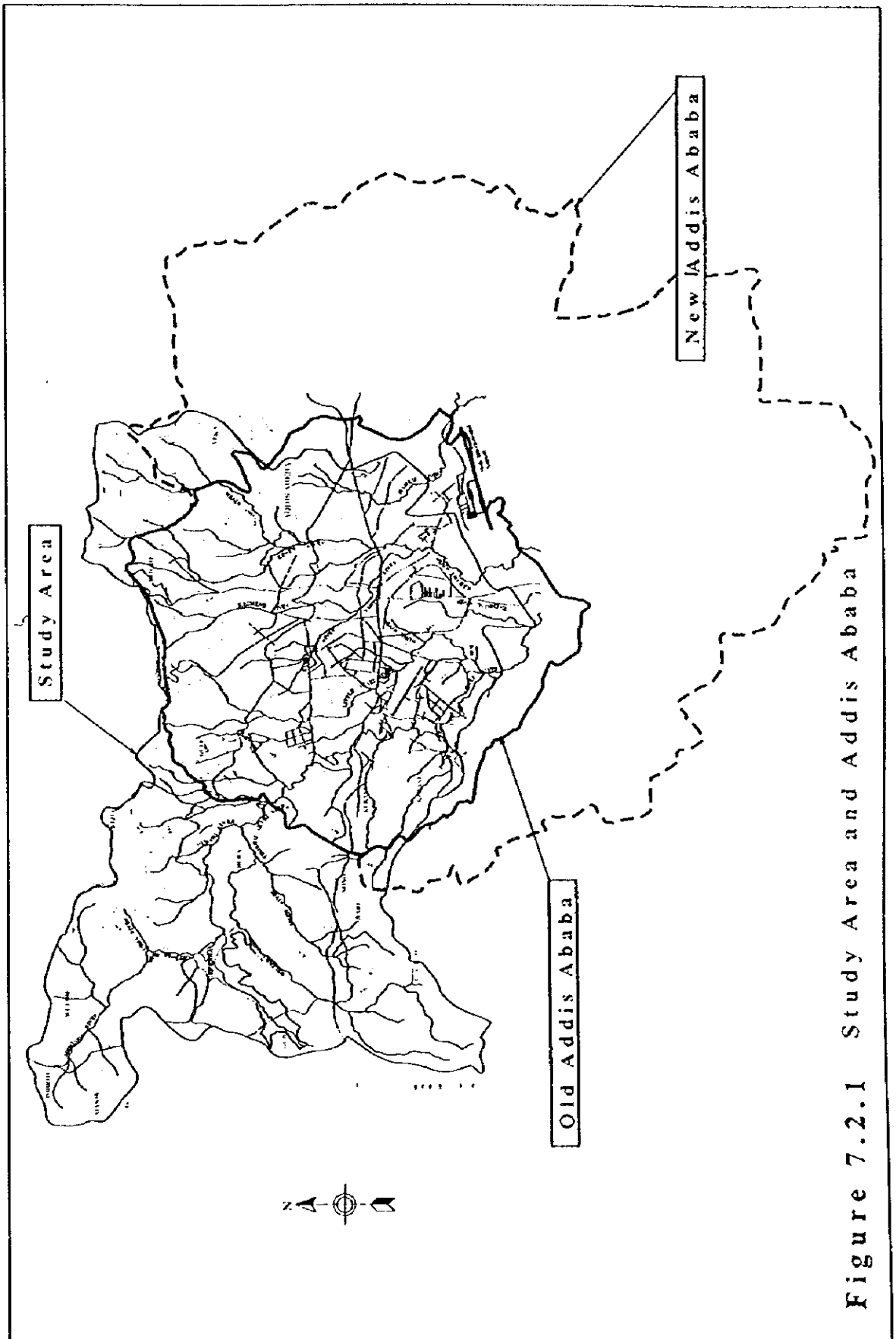


Figure 7.2.1 Study Area and Addis Ababa

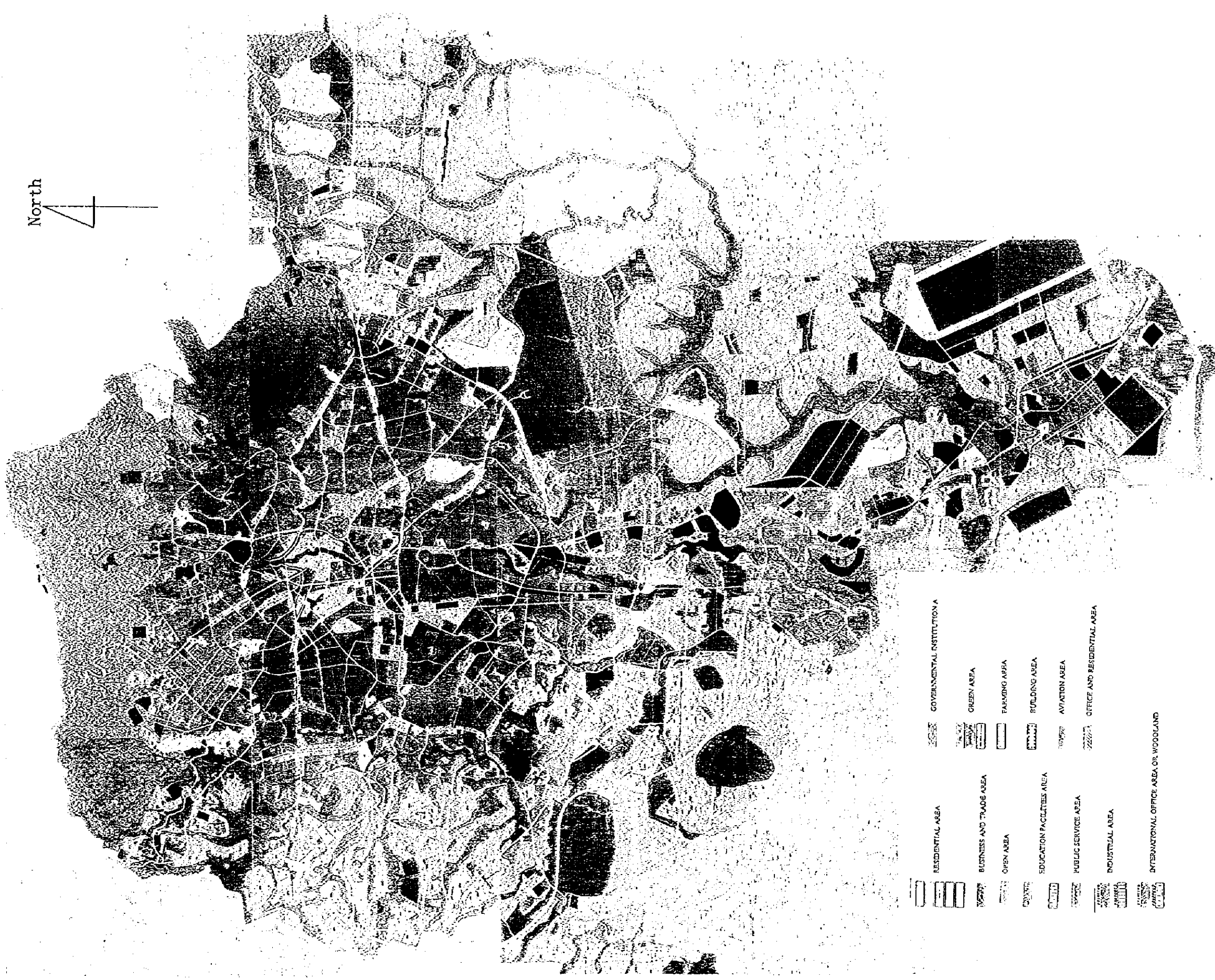


Figure 7.2.2 Land Use Plan by Addis Ababa Master Plan



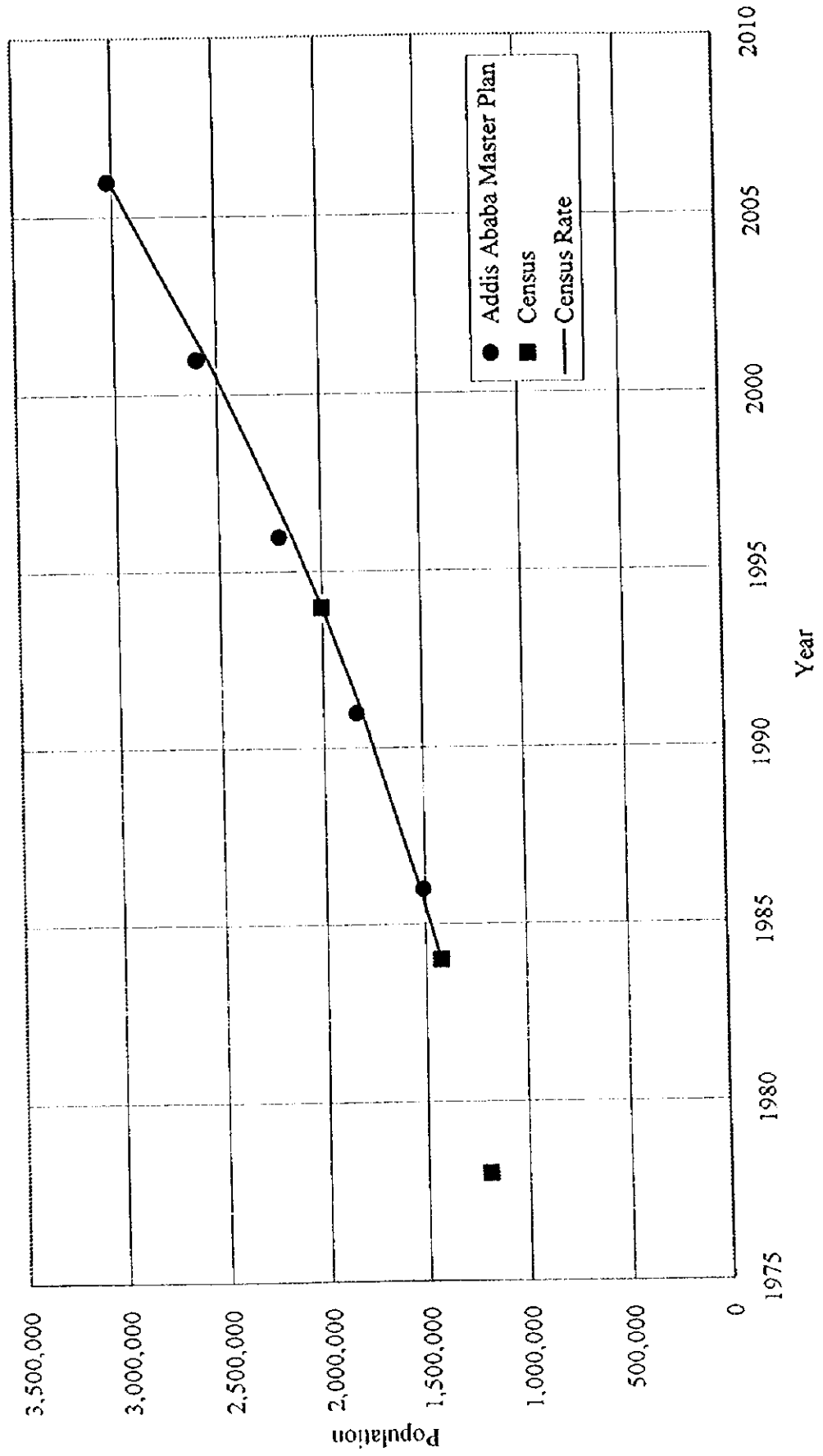


Figure 7.3.1 Population Projection in Addis Ababa in the Area as of 1984

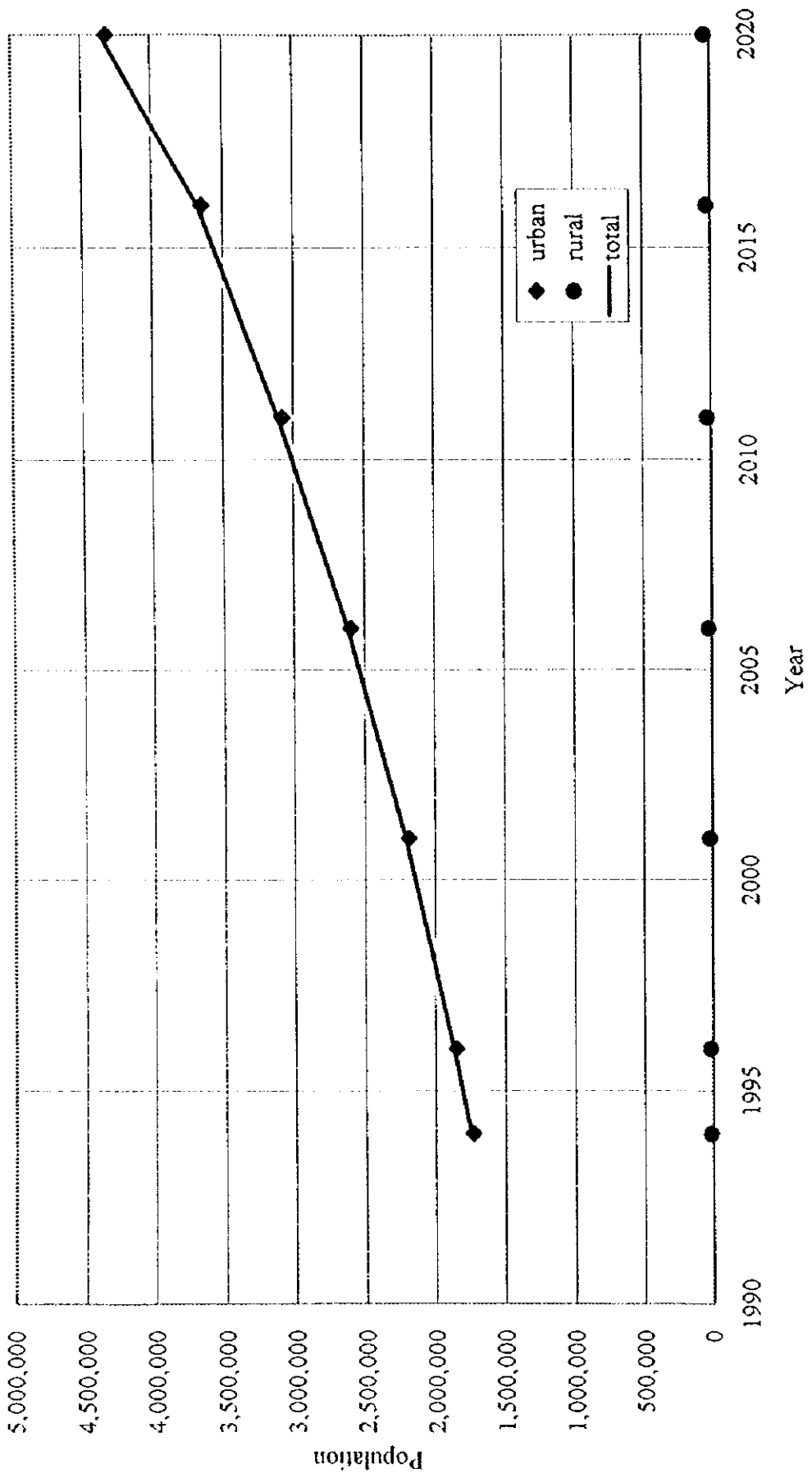


Figure 7.3.2 Population Projection in Study Area

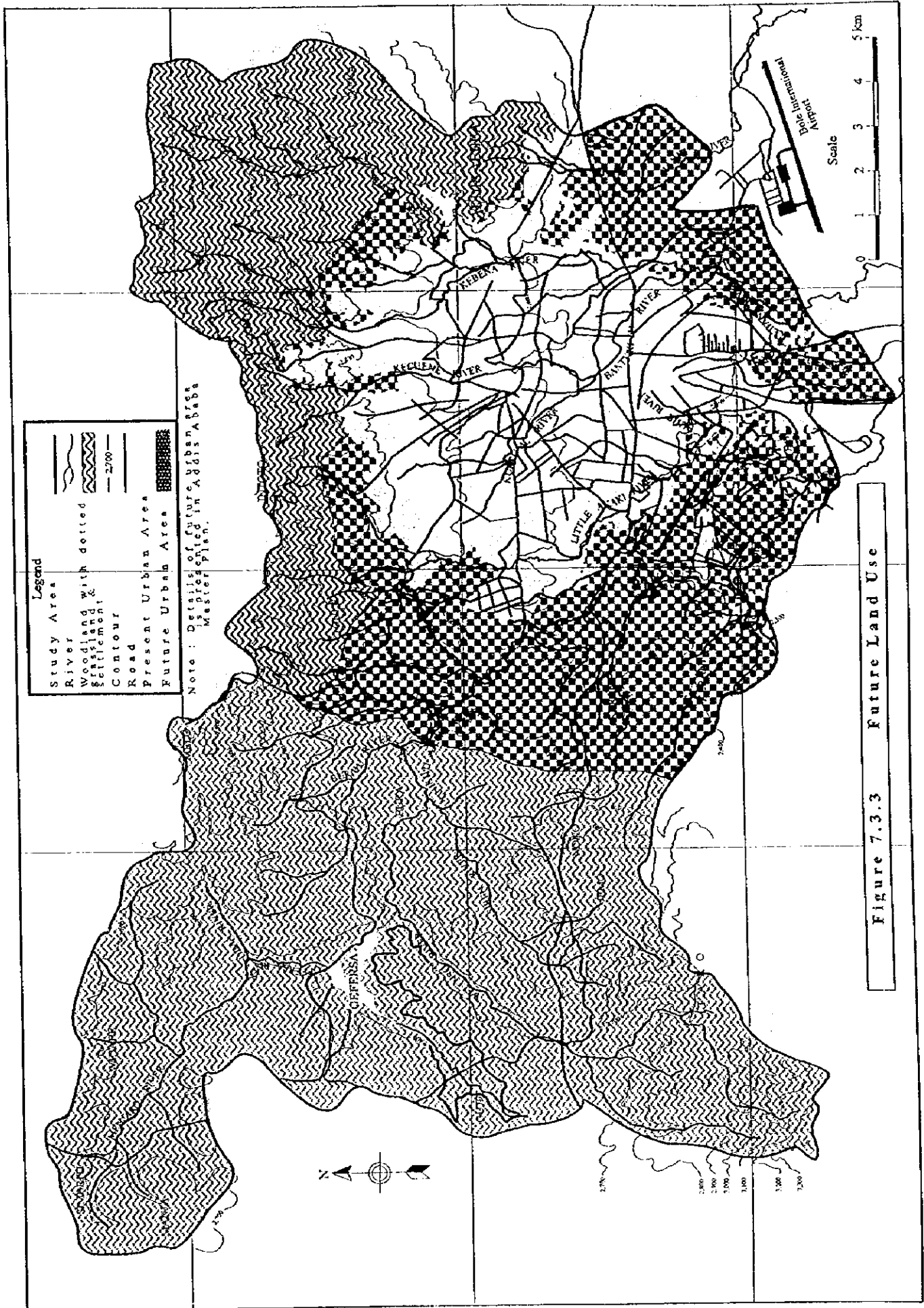


Figure 7.3.3 Future Land Use