14. Considerations

14-1 Coordinate Values of D-642 and HV-24 by Broadcast Ephemeris

The program package GEODOP-V computes the coordinates values of each point in multi-station solution. The coordinate values of D-642 and HV-24 obtained by using broadcast ephemeris in multi-station solution are given as follows for reference:

Point	D-642	HV-24
Latitude	2° 37' 55."521 S	2° 20' 05."029 S
Longitude	115° 06' 36."863 E	115° 38' 38."305 E
Height above reference ellipsoid	44.1m	65.6m

14-1-1 Comparison between the Coordinate Values of D-642 by Using Precise and Broadcast Ephemerides

Comparing the coordinate values of D-642 observed by BAKOSURTANAL in 1982 by using precise ephemeris (See paragraph 4-1-3.) and those observed by the present survey by using broadcast ephemeris,

(Results by precise ephemeris)

- (Results by broadcast ephemeris)

are as follows:

Difference in latitude	0."369 (=11.07m)
Difference in longitude	-0."159 (= 5.77m)
Difference in height above reference ellipsoid	1.1m

14-1-2 Geoidal Height at D-642 and HV-24

Heights above the mean sea level of both points are obtained

by direct levelling. Comparing the height above the reference ellipsoid by satellite geodesy with the height above the mean sea level, the geoidal heights at the points above the reference ellipsoid are obtained.

Point	D-642	HV-24
Height above reference ellipsoid	44.1m	65.6m
Height above mean sea level	2.0m	16.8m
Geoidal height	42.1m	44.8m

14-1-3 Geoidal Height in the Vicinity of the Survey Area

At the same time as the execution of the present survey, a project of topographical mapping at a scale of 1/50,000 has been carried out in the northern region of the survey area, as Tanjung being the south bound, in South Kalimantan Province by JICA. [11] For the geodetic control survey, horizontal control was done by satellite geodesy and observed data were processed by using broadcast ephemeris based on the same datum of the coordinate system and reference ellipsoid as the present survey and some of those points were vertically controlled by direct levelling based on the height of the bench mark PUTL-18 in Tanjung established by JICA in 1972, which is on the same basis as the present survey. Consequently, values of these points and two points of D-642 (by broadcast ephemeris) and HV-24 obtained by the present survey can be considered to discuss together regarding that they are of the same group of observation. Their heights are given in Tab. 14.1 and point distribution is shown in Fig. 14.1.

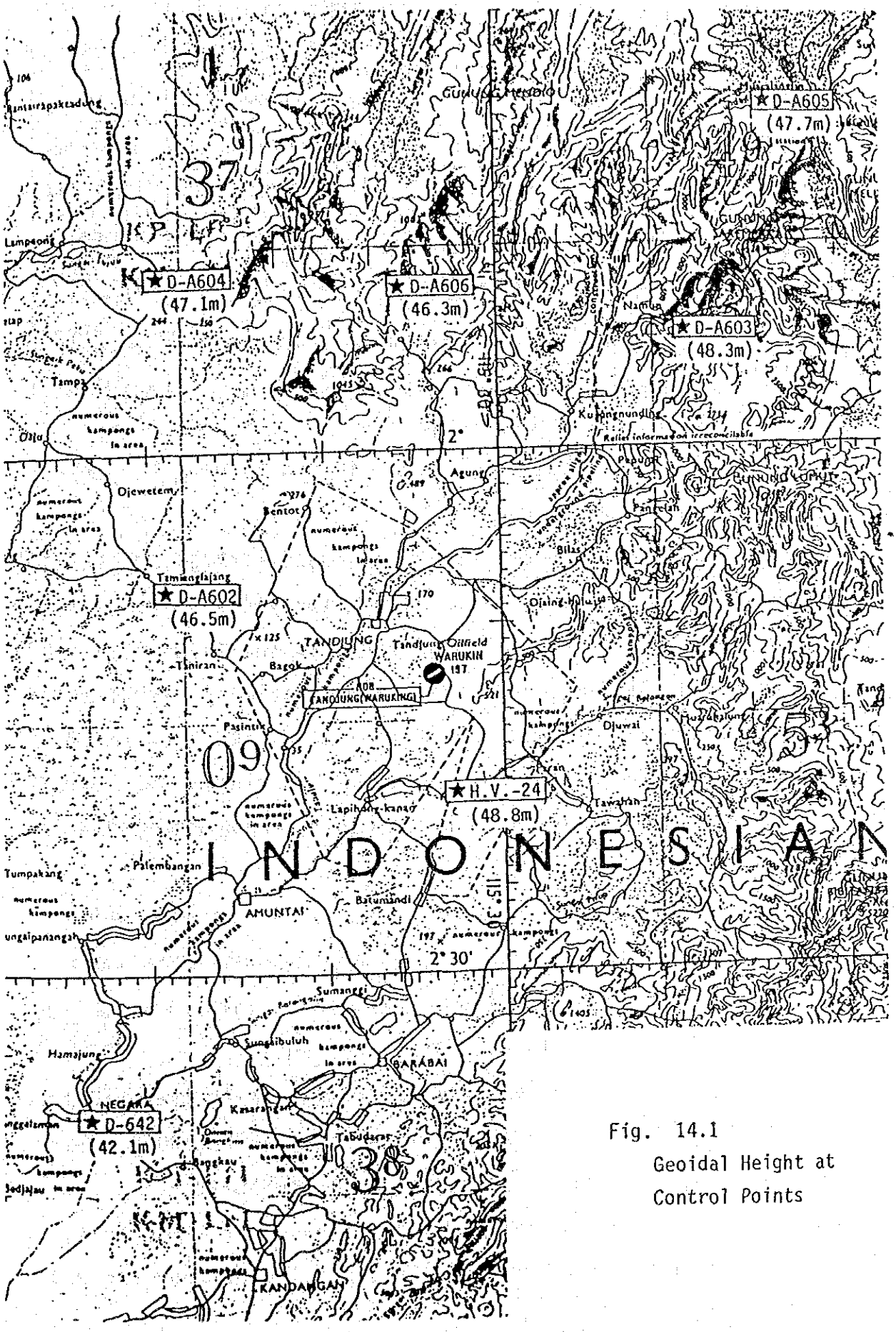


Fig. 14.1
Geoidal Height at
Control Points

Point name	Height above ID-1974	Height above mean sea level	Geoidal height
D-A602 (NS-3)	57.758m	11.246m	46.512m
D-A603 (NS-4)	212.035m	163.775m	48.260m
D-A604 (NS-5)	90.409m	43.279m	47.130m
D-A605 (NS-6)	126.500m	78.837m	47.663m
D-A606 (NS-7)	232.214m	185.88m	46.33m
HV-24	65.6m	16.8m	48.8m
D-642	44.1m	2.0m	42.1m

Tab. 14.1 Height of the NNSS Observed Points

14-2 Coordinate Values of HV-12

Topographic maps were prepared at a scale of 1/50,000 in the Barito River Basin including the present survey area during the periods of 1972 - 1974 by OTCA [1]. As for the horizontal control for this mapping, were used existing triangulation points and astronomical points established for this mapping. Bessel ellipsoid was adopted as the reference ellipsoid and UTM Projection was applied. However, the location of the datum of the geodetic coordinate system was not clear.

For the present survey, the geodetic coordinate system is based on the satellite geodesy point D-642 established by BAKOSURTANAL in 1982. The Indonesian Datum-1974 is adopted as the reference ellipsoid and UTM Projection is applied.

There is a point astronomically established for the said topographic mapping in 1972: PUTAS-3. This point is included in the present survey area and was resurveyed as a new point HV-12. Comparing the two results of this point obtained in 1972 and 1984, it is able to estimate the systematic discrepancies between the old

1/50,000 scale topographic maps and the new 1/10,000 photomaps. The comparison of the coordinate values is given in Tab. 14.2.

From the above results, it may be estimated that the 1/10,000 photomaps prepared in 1985 lie about 138m to the south and about 971m to the east of the 1/50,000 topographic maps prepared in 1974.

Item	Latitude	Longitude	N	E
Coordinate values of 1972	2° 47' 19."32 S	115° 15' 16."14 E	9,691,650 m	305,990 m
Coordinate values of 1984	2° 47' 22."811 S	115° 15' 48."377 E	9,691,516.789 m	306,961.301 m
Difference	- 3."491	- 32."237	138,211 m	-971.301 m

Tab. 14.2 Comparison of Coordinate Values of PUTAS-3 (or HV-12)

14-3 River Surface Gradient Obtained from Indirect Levelling

In indirect levelling using water level observation, water surface height was observed simultaneously at 19 spots in low swampy area. Based on the results of the observation, gradients of the surface of the rivers flowing through the swampy area were derived. (See Fig. 14.2.) The gradients are classified into the following three areas:

(1) East side of the road running through the central part of the swampy area,

river surface gradient 1/5,000 - 1/10,000

(2) West side of the road running through the central part of the swampy area,

river surface gradient 1/10,000 - 1/20,000

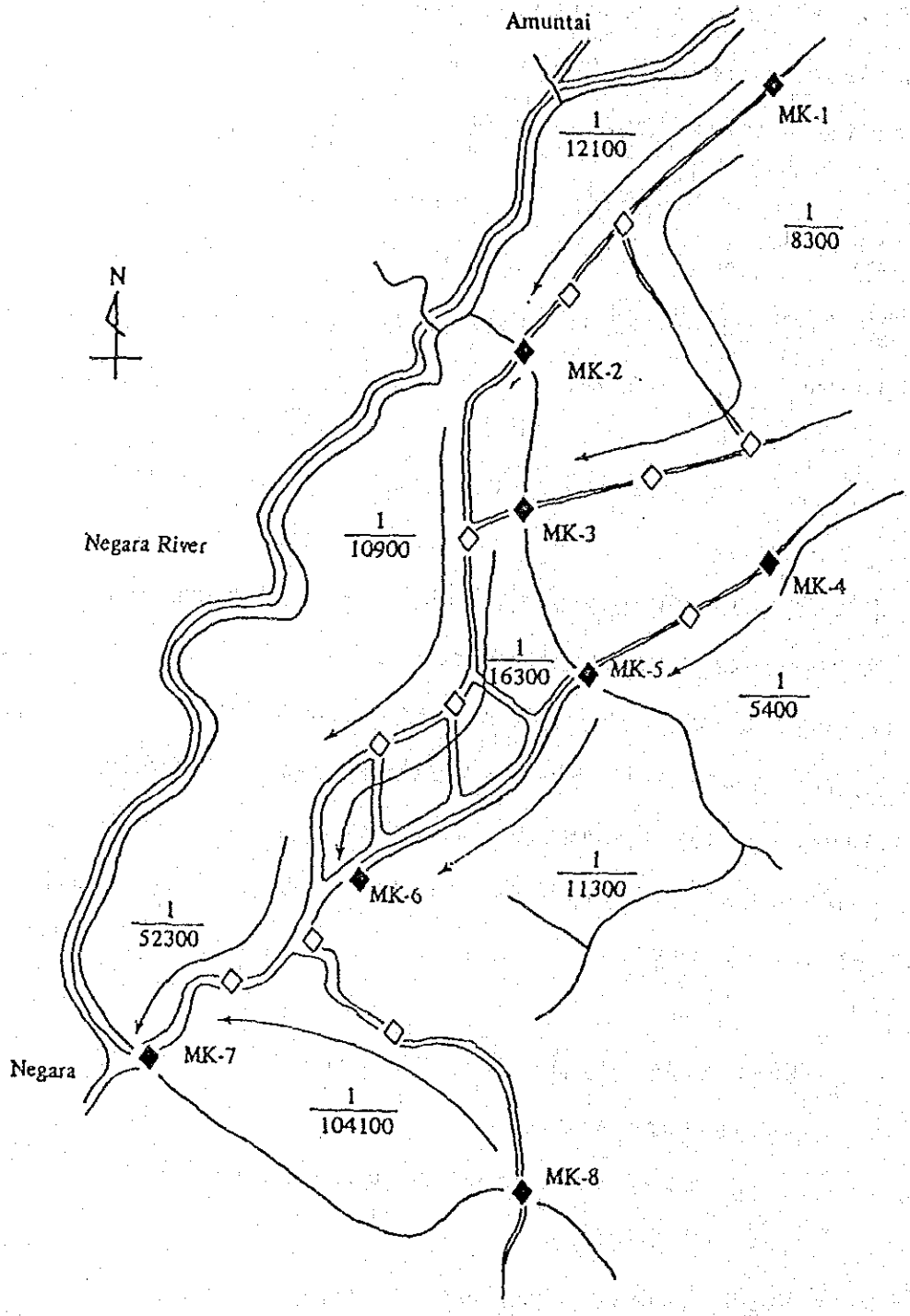


Fig. 14.2 River Surface Gradient Obtained from Water Level Observation

(3) Area including a lake in the southern part of the swampy area and Negara City,

river surface gradient 1/50,000 - 1/100,000.

14-4 Linking of Height of Water Gauges to Bench Marks

There are many water gauge stations along the rivers in the survey area. Some of those are installed with automatic water gauges. The height of the following automatic water gauges was established by direct levelling starting from the bench marks. (See Fig. 14.3.)

(1) W-1: Approximately 500m downstream from a bridge crossing the river on the road, along HV-1, from Amuntai toward Tanjung,

(2) W-2: Approximately 150m downstream from a bridge across the Negara River near PUTL-15 at Amuntai,

(3) W-3: Approximately 50m upstream of the river from a bridge at Sungai Buluh (near HV-22),

(4) W-4: Approximately 1km downstream of the Negara River from the confluence of the Sungai Buluh and Negara Rivers,

(5) W-5: Approximately 1km south of BMIII-1 along the river flowing from Kandangan.

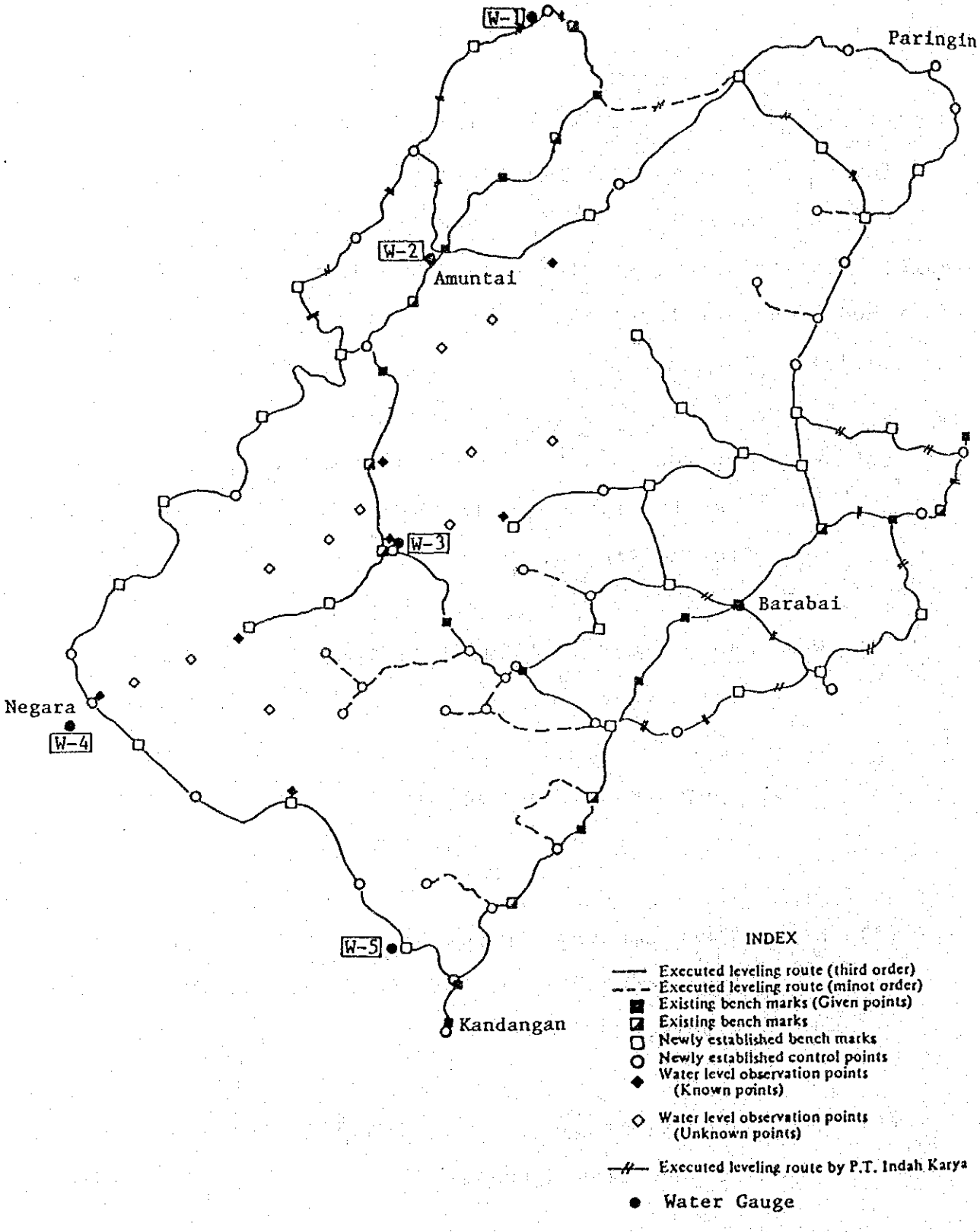


Fig. 14.3 Automatic Water Gauge Stations Linked to Bench Marks

14-5 Overview of the Survey Area per Each Sheet of Maps

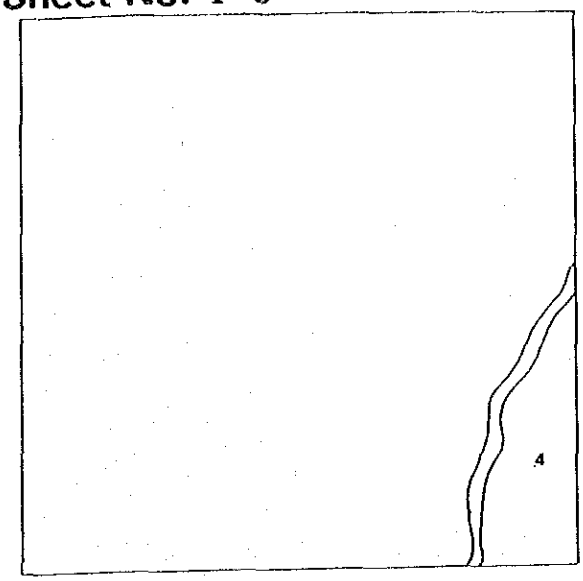
In Fig. 14.4 are shown the overviews of landform, water covered area, land-use and vegetation of respective map sheet.

15. Closing Remarks

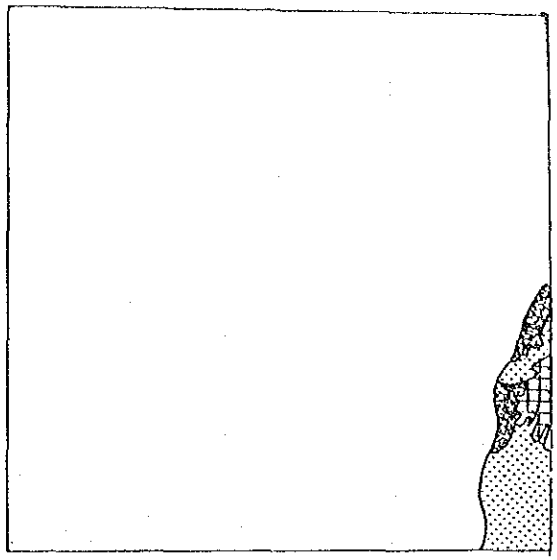
The present photomapping project consists of the preparation of 1/10,000 scale photomaps, thematic maps showing landform classification, vegetation and land-use on the basis of the 1/10,000 scale photomap and a trial of representing those thematic items together on the same map. Trials and errors were repeated for its preparation. We are concerned about if the final products would turn out favorable to users. It is hoped to prepare better ones by their advices in future.

Fig. 14.4 Overview of the Survey Area per Each Sheet of Maps

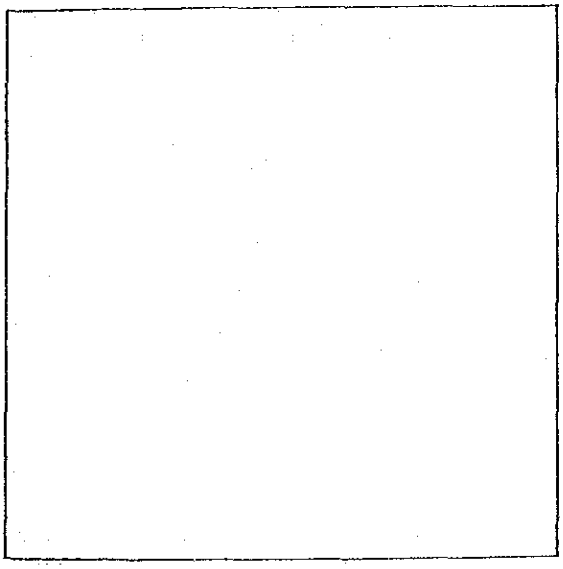
Sheet No. I-3



(Landform)



(Landuse. Vegetation)

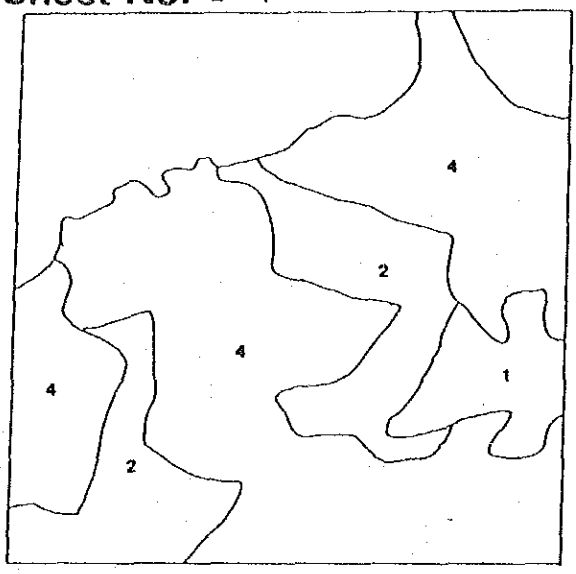


(Water covered area)

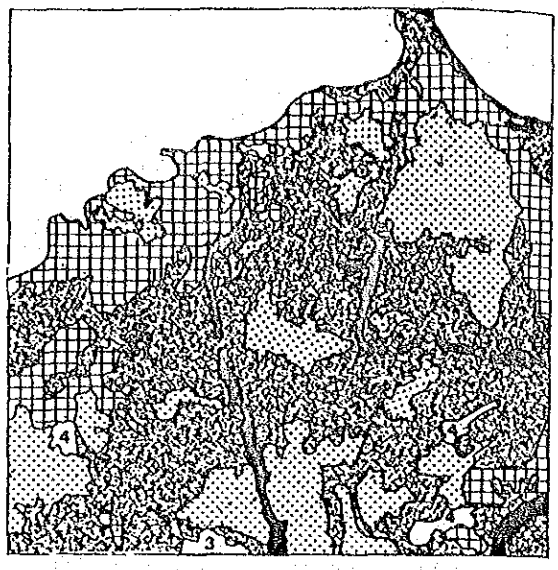
The area of landuse(Vegetation)		(Km²)
	Forest	0.3
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	0.1
	Paddy field in dry season	1.1
	Paddy field in rainy season	-
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	0.2

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

Sheet No. I-4



(Landform)



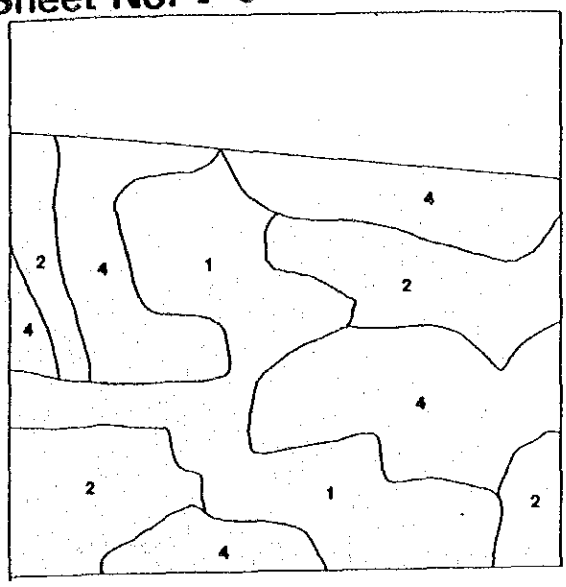
(Landuse. Vegetation)

(Water covered area)

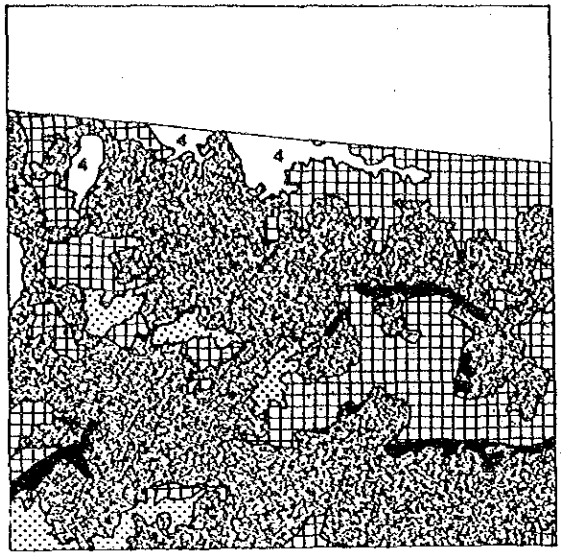
The area of landuse(Vegetation)		(Km^2)
	Forest	14.1
2	Shrub	-
3	Tall humidiherbosa	0.4
4	Short humidiherbosa	0.3
5	Dry meadow	0.3
6	Floating grass	0.2
	Paddy field in dry season	9.0
	Paddy field in rainy season	4.1
9	Fallow paddy field	0.5
10	Field	0.1
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.5
	Residential area	1.6

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season			In rainy season		

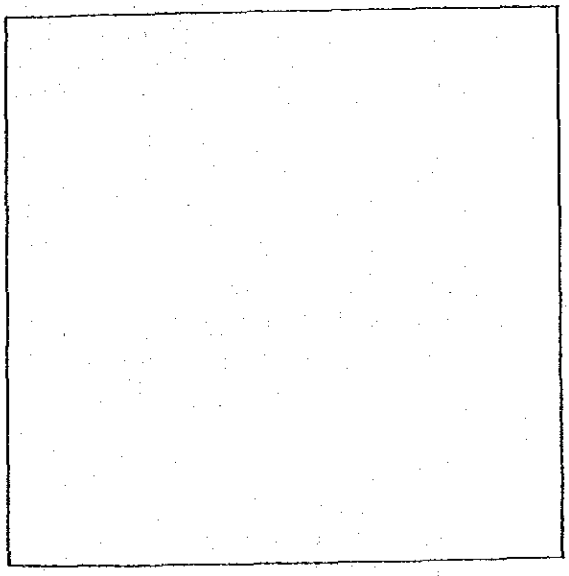
Sheet No. I-5



(Landform)



(Landuse.Vegetation)

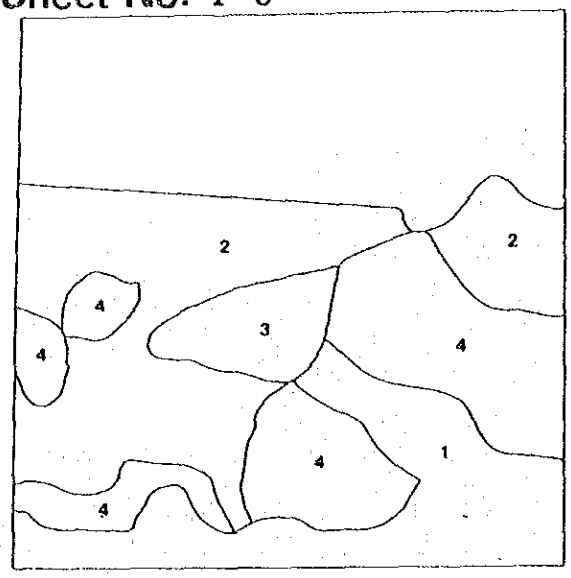


(Water covered area)

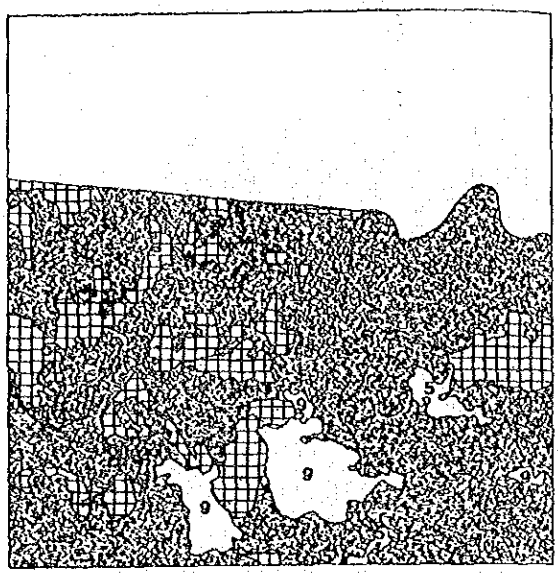
The area of landuse(Vegetation)		(Km^2)
1	Forest	15.3
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	1.9
5	Dry meadow	0.5
6	Floating grass	0.2
	Paddy field in dry season	2.2
	Paddy field in rainy season	5.6
9	Fallow paddy field	0.4
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.3
	Residential area	0.8

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation	1	Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

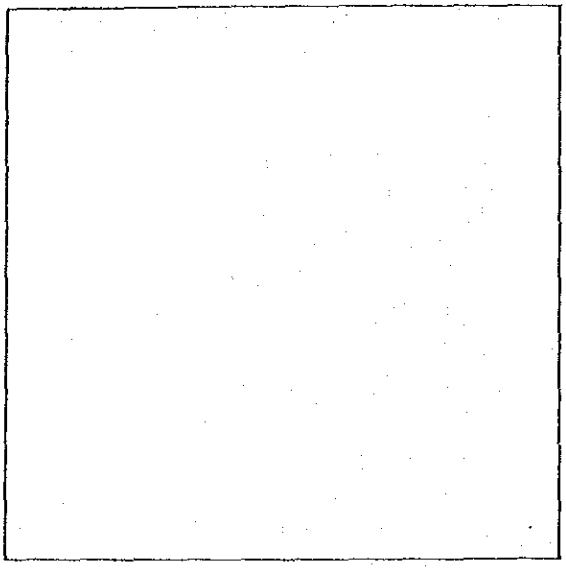
Sheet No. I-6



(Landform)



(Landuse.Vegetation)

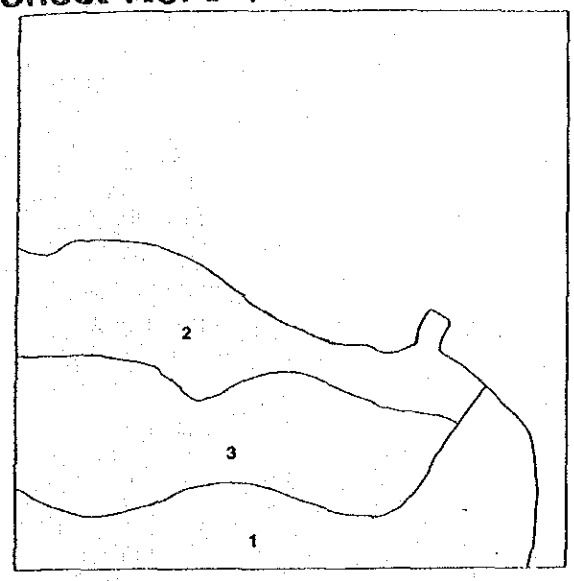


(Water covered area)

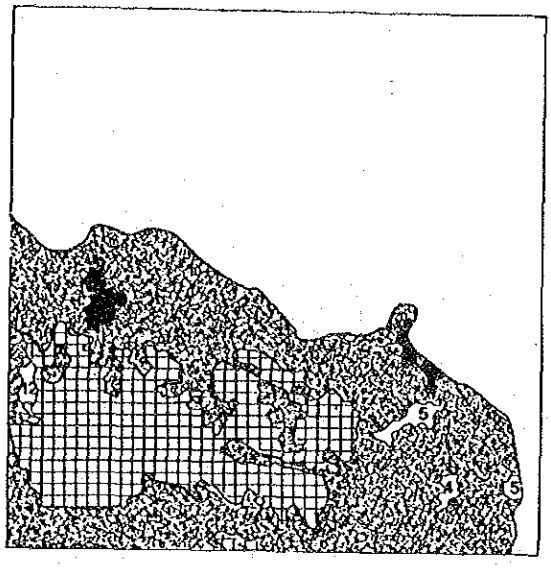
The area of landuse(Vegetation)		(Km²)
	Forest	14.6
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	0.3
5	Dry meadow	0.4
6	Floating grass	-
	Paddy field in dry season	0.2
	Paddy field in rainy season	5.6
9	Fallow paddy field	1.4
10	Field	0.1
11	Pasture	-
12	Burnt field	0.1
13	Water covered area	0.1
	Residential area	0.8

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Shart humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season		In rainy season			

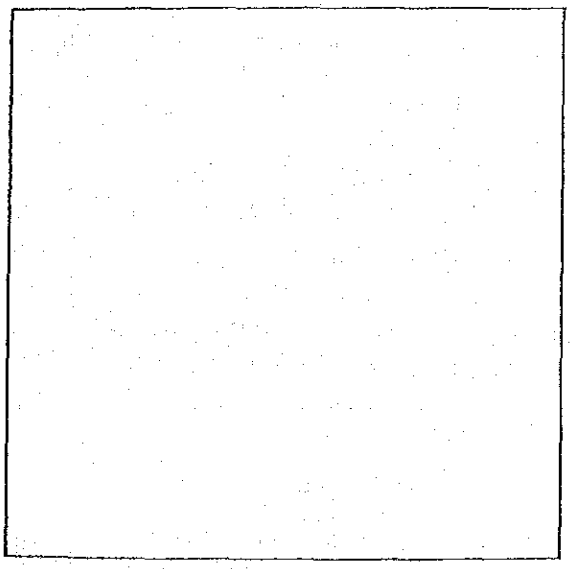
Sheet No. I-7



(Landform)



(Landuse.Vegetation)

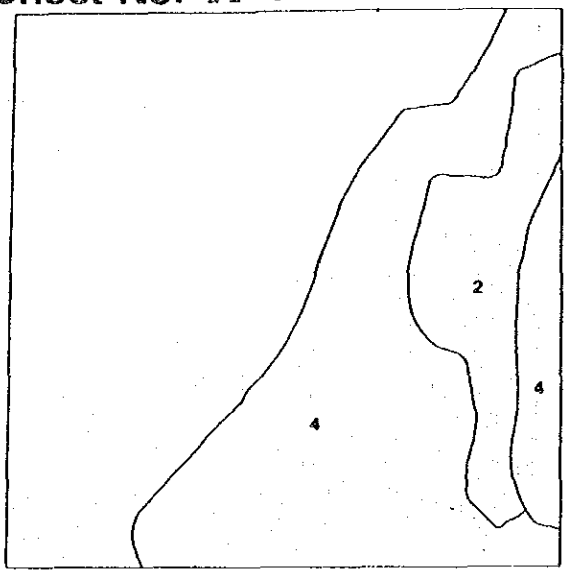


(Water covered area)

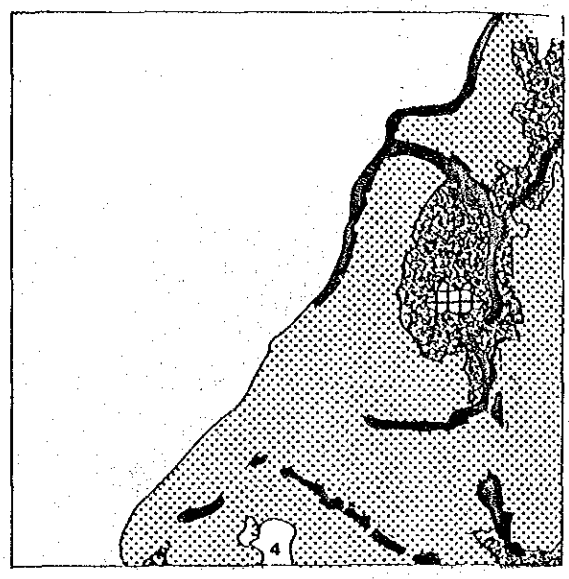
The area of landuse(Vegetation)		(Km²)
1	Forest	9.8
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	0.2
5	Dry meadow	0.8
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	4.8
9	Fallow paddy field	0.2
10	Field	0.4
11	Pasture	-
12	Burnt field	0.3
13	Water covered area	0.4
	Residential area	0.7

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation	1	Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season		In rainy season			

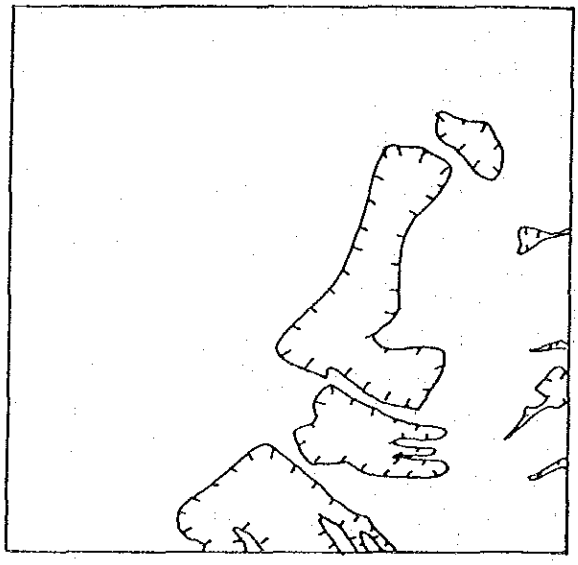
Sheet No. II-3



(Landform)



(Landuse. Vegetation)

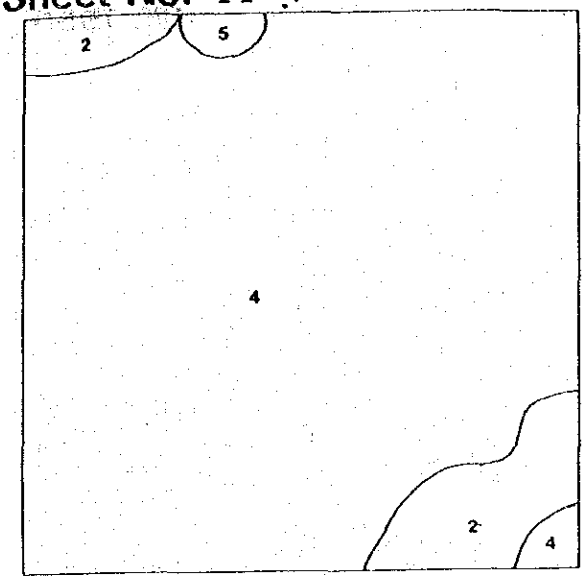


(Water covered area)

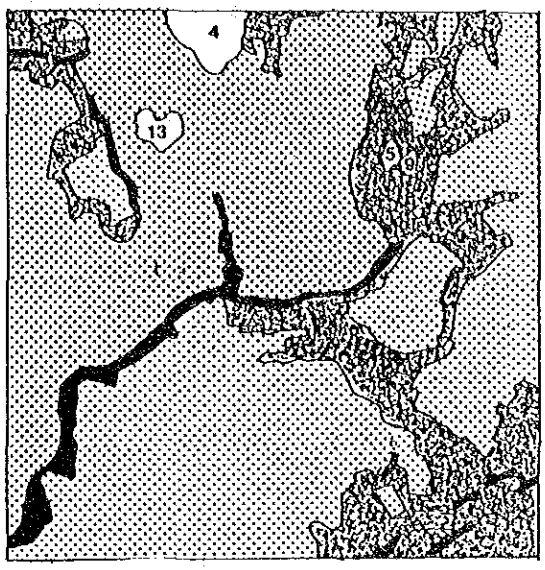
The area of landuse(Vegetation)		(Km²)
	Forest	3.9
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	0.1
5	Dry meadow	0.1
6	Floating grass	-
	Paddy field in dry season	9.9
	Paddy field in rainy season	0.3
9	Fallow paddy field	0.5
10	Field	0.3
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.4
	Residential area	1.8

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

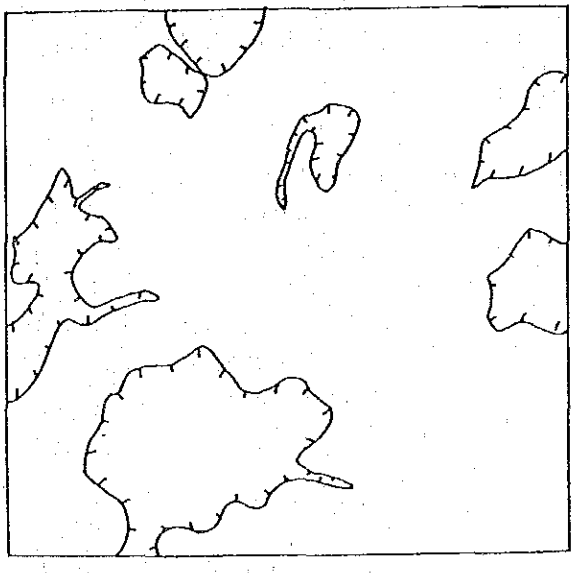
Sheet No. II-4



(Landform)



(Landuse. Vegetation)

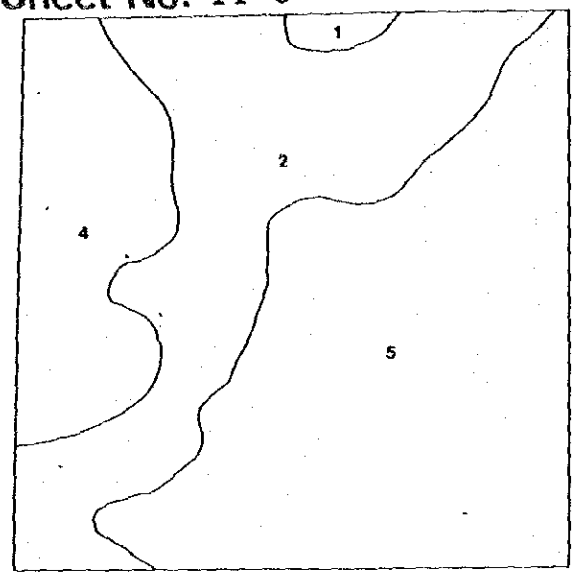


(Water covered area)

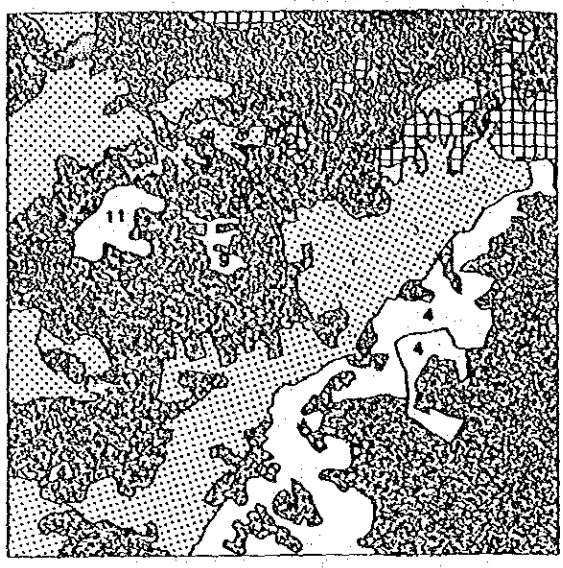
The area of landuse(Vegetation)		(Km²)
	Forest	8.6
2	Shrub	-
3	Tall humidiherbosa	0.6
4	Short humidiherbosa	0.1
5	Dry meadow	0.2
6	Floating grass	0.1
	Paddy field in dry season	23.1
	Paddy field in rainy season	-
9	Fallow paddy field	0.5
10	Field	0.1
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.8
	Residential area	1.9

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

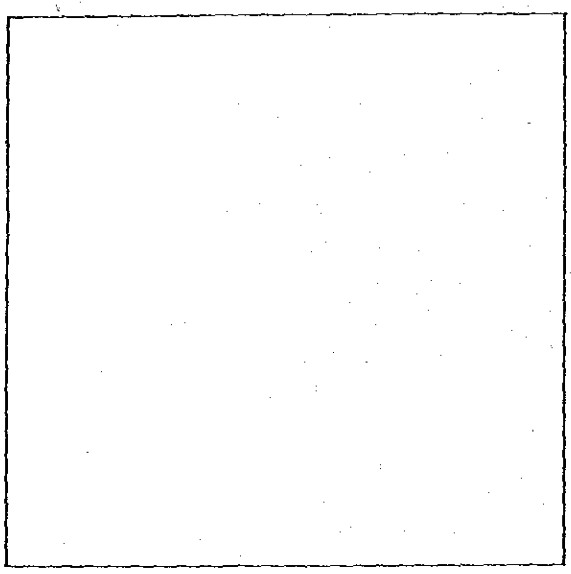
Sheet No. II-5



(Landform)



(Landuse. Vegetation)

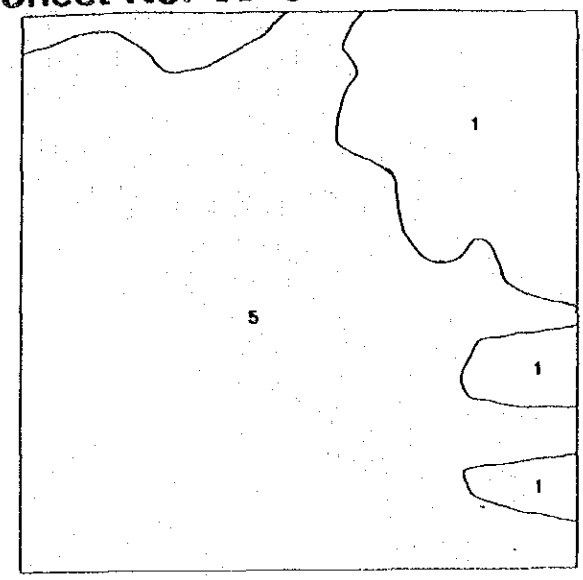


(Water covered area)

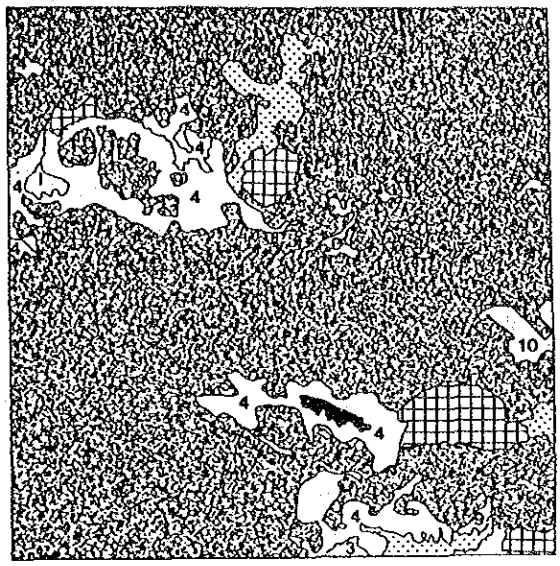
The area of landuse(Vegetation)		(Km²)
	Forest	19.1
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	3.6
5	Dry meadow	0.2
6	Floating grass	0.1
	Paddy field in dry season	8.6
	Paddy field in rainy season	1.2
9	Fallow paddy field	2.1
10	Field	0.1
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.4
	Residential area	0 6

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

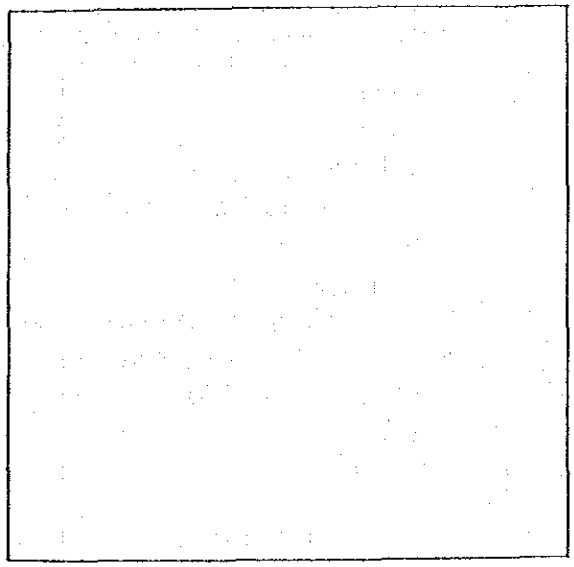
Sheet No. II-6



(Landform)



(Landuse.Vegetation)

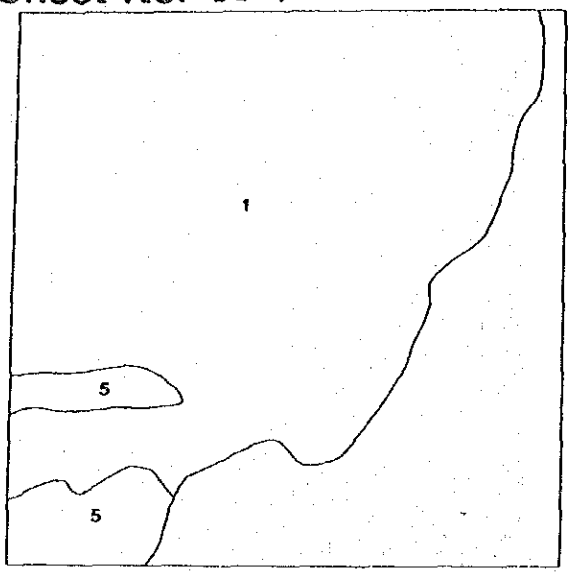


(Water covered area)

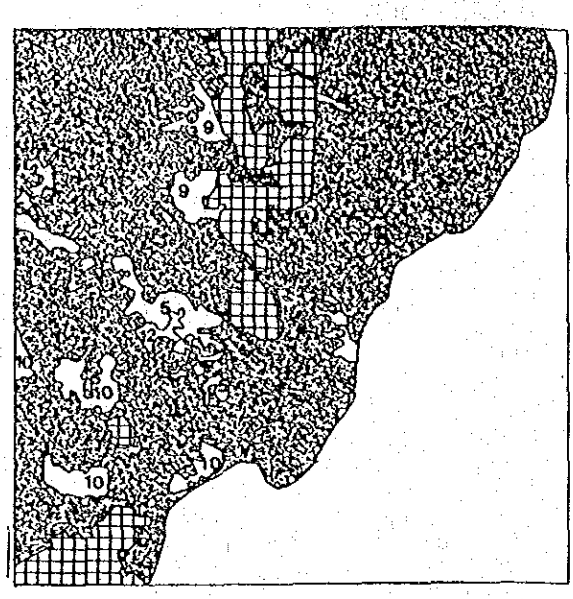
The area of landuse(Vegetation)		(Km^2)
	Forest	28.0
2	Shrub	-
3	Tall humidiherbosa	0.1
4	Short humidiherbosa	3.7
5	Dry meadow	0.4
6	Floating grass	-
	Paddy field in dry season	1.1
	Paddy field in rainy season	1.7
9	Fallow paddy field	0.7
10	Field	0.3
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Shart humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

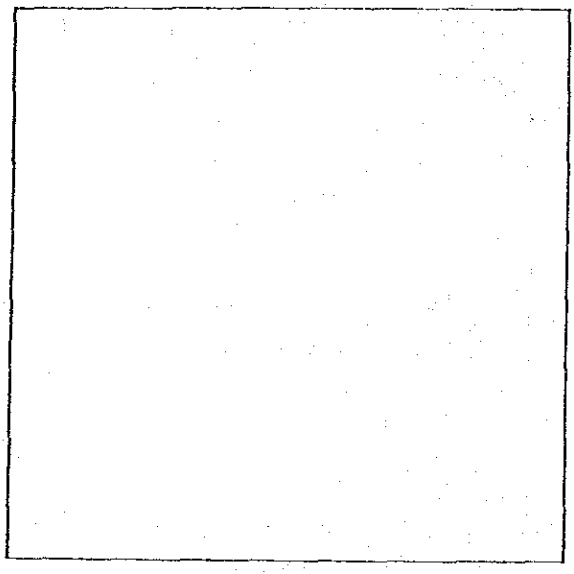
Sheet No. II-7



(Landform)



(Landuse. Vegetation)

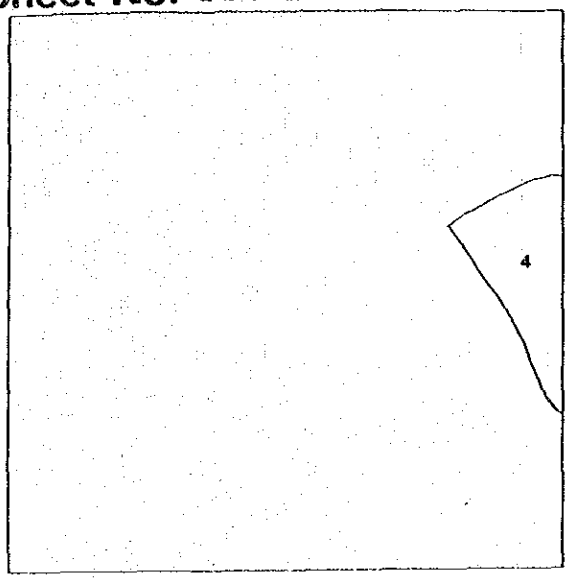


(Water covered area)

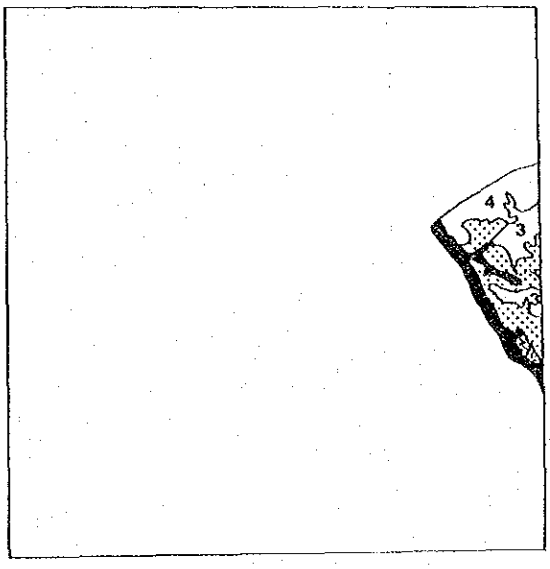
The area of landuse(Vegetation)		(Km²)
	Forest	17.8
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	1.6
6	Floating grass	-
	Paddy field in dry season	0.3
	Paddy field in rainy season	2.6
9	Fallow paddy field	0.6
10	Field	0.9
11	Pasture	-
12	Burnt field	0.1
13	Water covered area	-
	Residential area	0.1

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season		In rainy season			

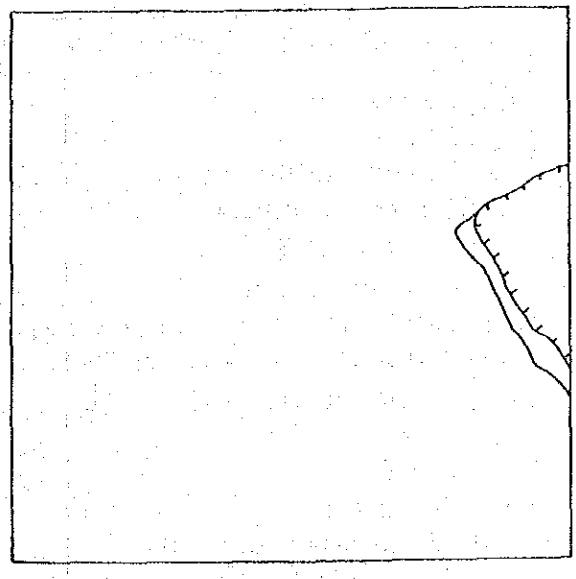
Sheet No. III-2



(Landform)



(Landuse. Vegetation)

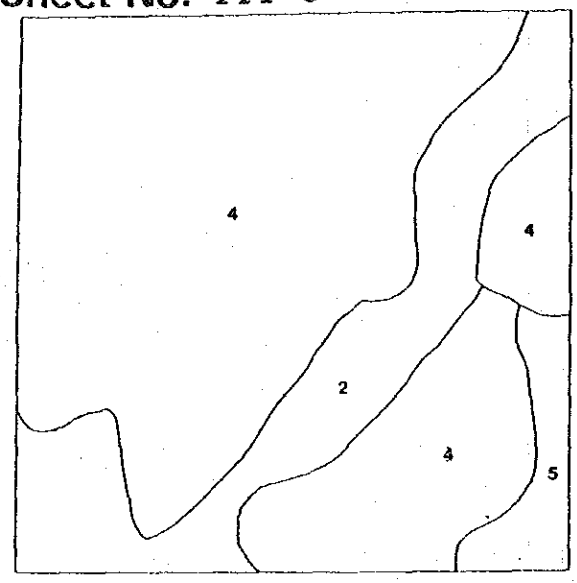


(Water covered area)

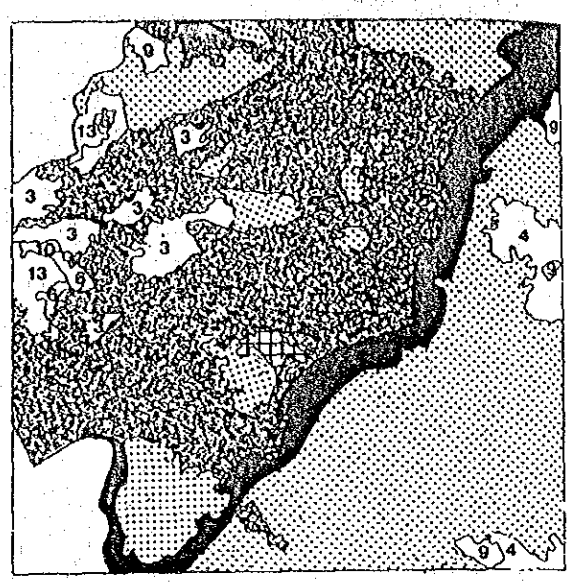
The area of landuse(Vegetation)		(Km²)
	Forest	-
2	Shrub	-
3	Tall humidiherbosa	0.4
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	1.1
	Paddy field in rainy season	-
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.1
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

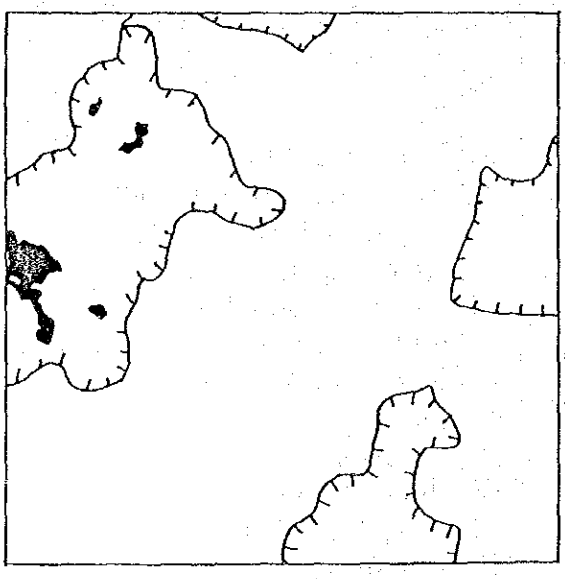
Sheet No. III-3



(Landform)



(Landuse. Vegetation)

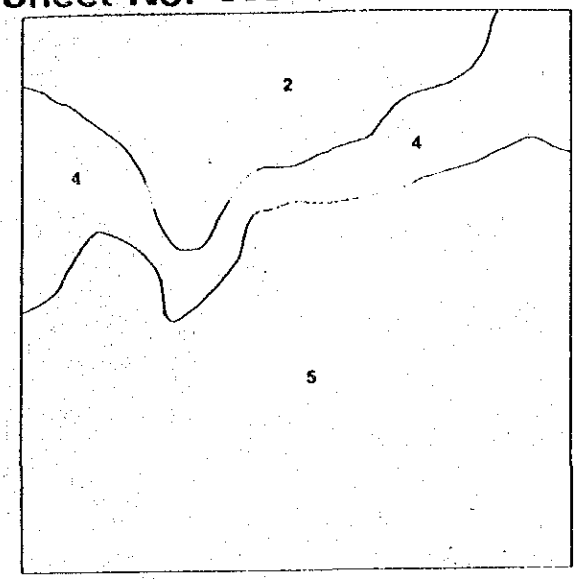


(Water covered area)

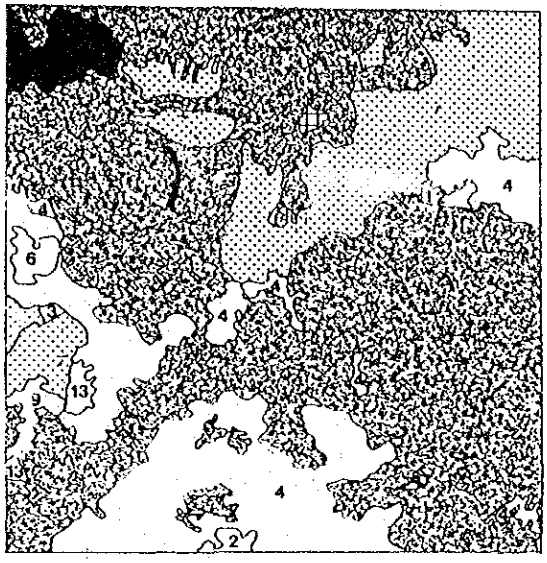
The area of landuse(Vegetation)		(Km²)
	Forest	4.8
2	Shrub	-
3	Tall humidiherbosa	1.2
4	Short humidiherbosa	0.7
5	Dry meadow	-
6	Floating grass	0.5
	Paddy field in dry season	24.3
	Paddy field in rainy season	0.5
9	Fallow paddy field	1.1
10	Field	0.2
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.6
	Residential area	0.3

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

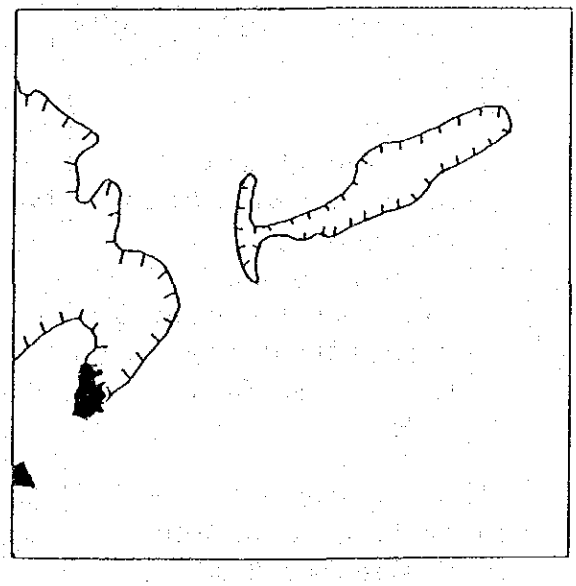
Sheet No. III-4



(Landform)



(Landuse. Vegetation)

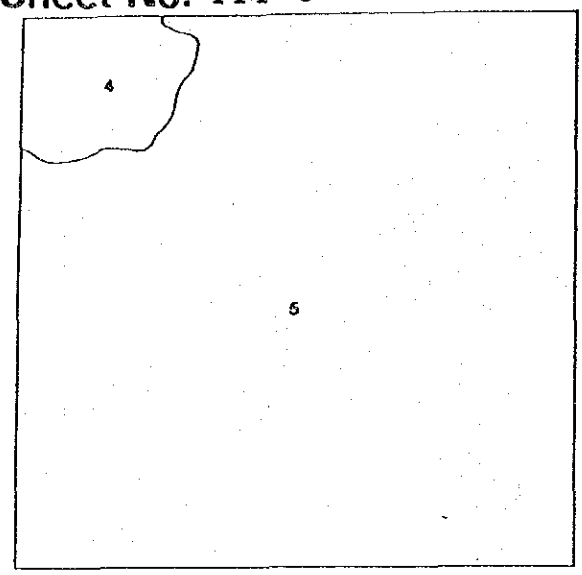


(Water covered area)

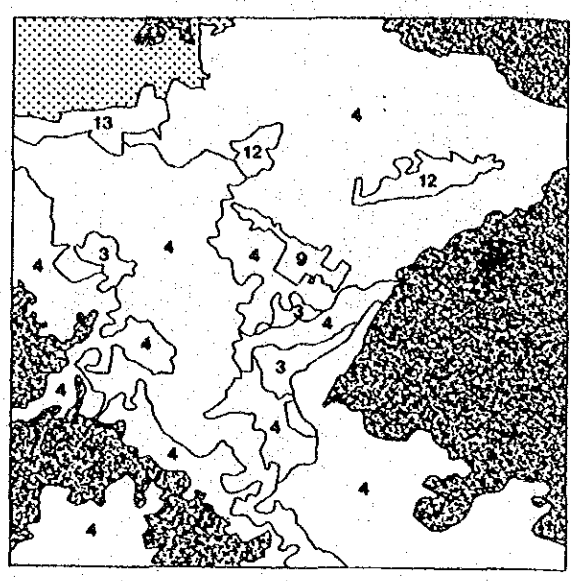
The area of landuse(Vegetation)		(Km²)
	Forest	20.7
2	Shrub	0.1
3	Tall humidiherbosa	0.6
4	Short humidiherbosa	5.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	7.0
	Paddy field in rainy season	-
9	Fallow paddy field	0.9
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.8
	Residential area	0.4

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use · Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season		In rainy season			

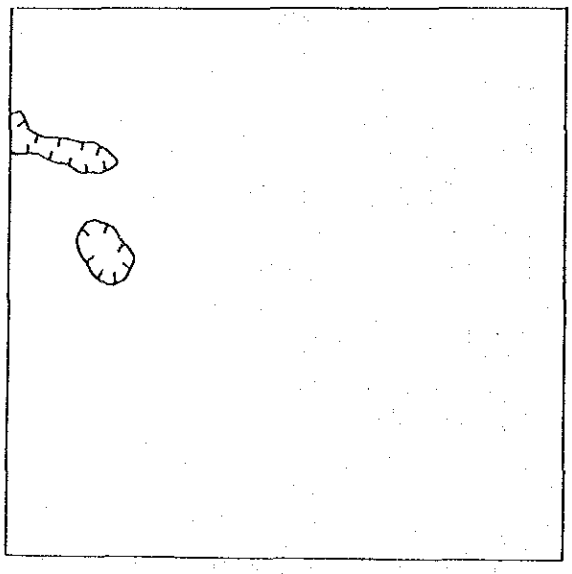
Sheet No. III-5



(Landform)



(Landuse.Vegetation)

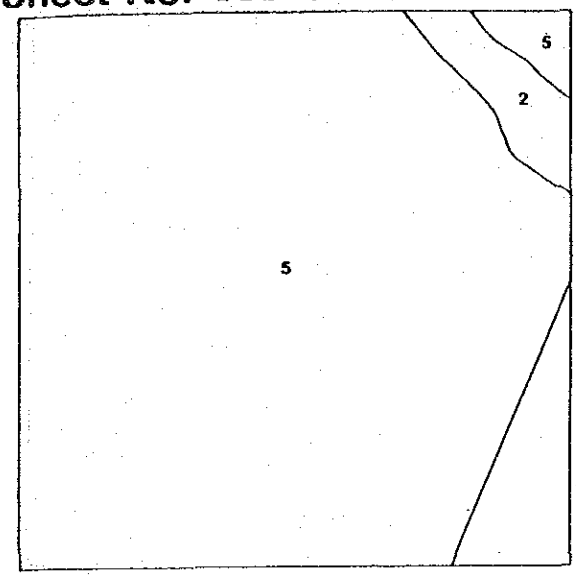


(Water covered area)

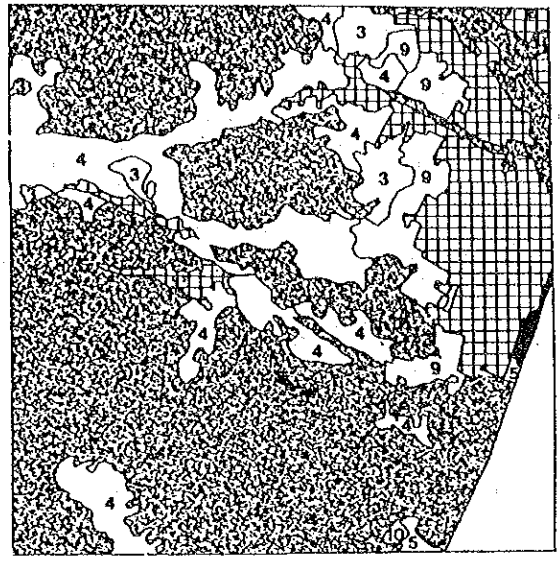
The area of landuse(Vegetation)		(Km²)
	Forest	12.5
2	Shrub	-
3	Tall humidiherbosa	3.4
4	Short humidiherbosa	16.4
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	2.5
	Paddy field in rainy season	-
9	Fallow paddy field	0.7
10	Field	-
11	Pasture	-
12	Burnt field	0.4
13	Water covered area	0.1
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season		In rainy season			

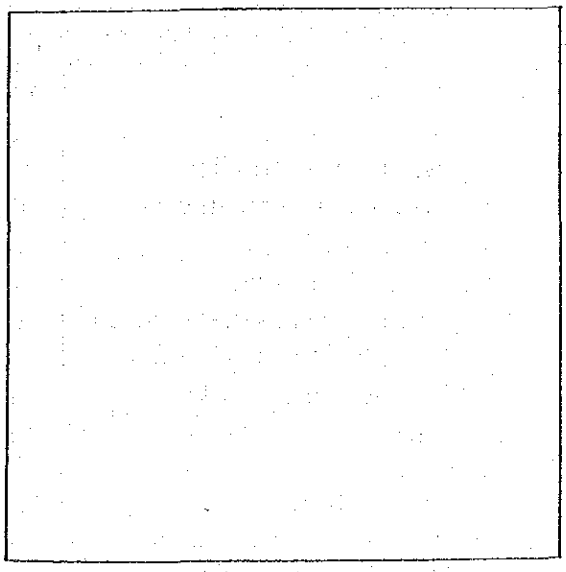
Sheet No. III-6



(Landform)



(Landuse. Vegetation)

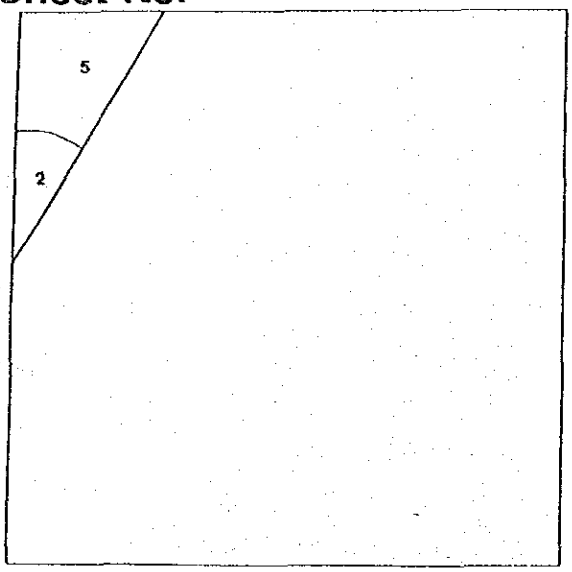


(Water covered area)

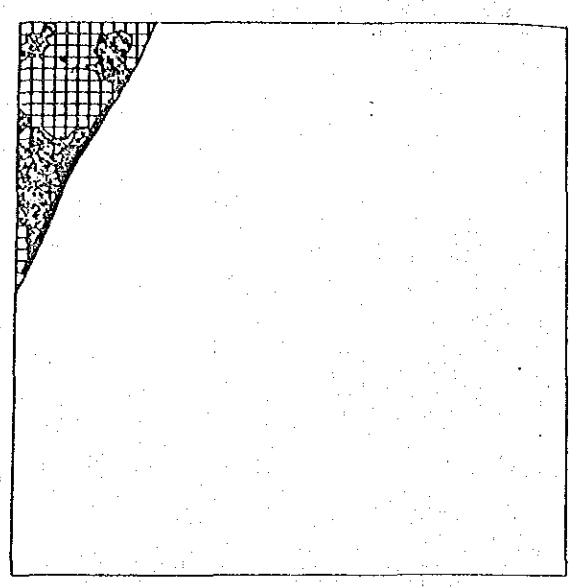
The area of landuse(Vegetation)		(Km²)
	Forest	25.4
2	Shrub	-
3	Tall humidiherbosa	0.6
4	Short humidiherbosa	2.8
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	4.4
9	Fallow paddy field	1.0
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

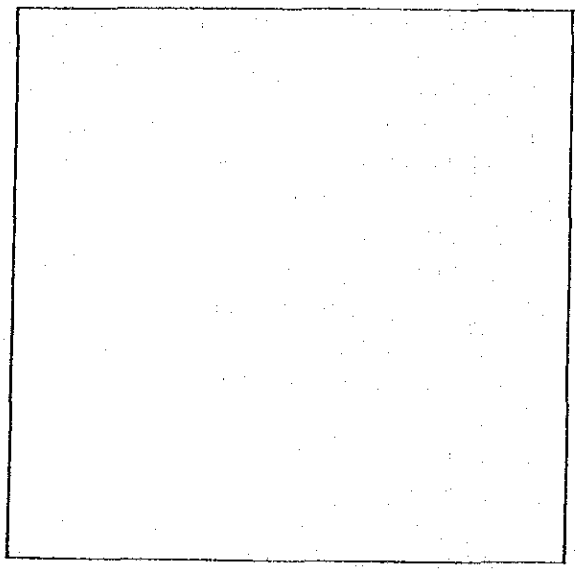
Sheet No. III-7



(Landform)



(Landuse. Vegetation)

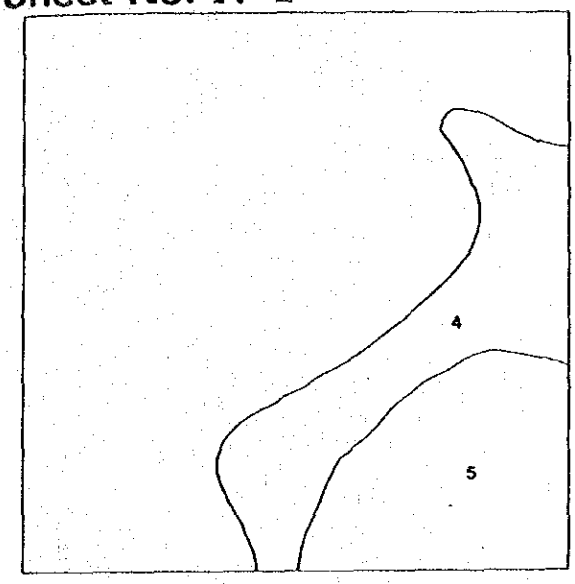


(Water covered area)

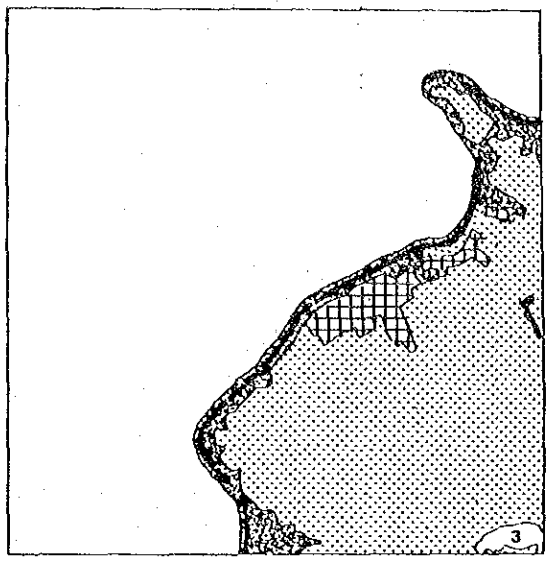
The area of landuse(Vegetation)		(Km²)
1	Forest	0.5
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	1.6
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation	1	Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season		In rainy season			

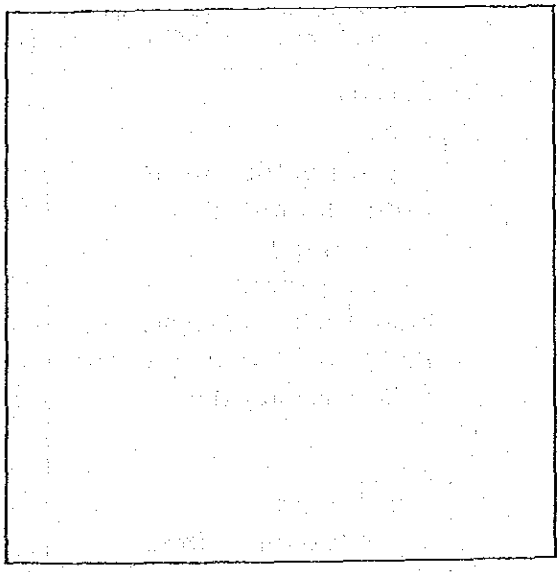
Sheet No. IV-2



(Landform)



(Landuse. Vegetation)

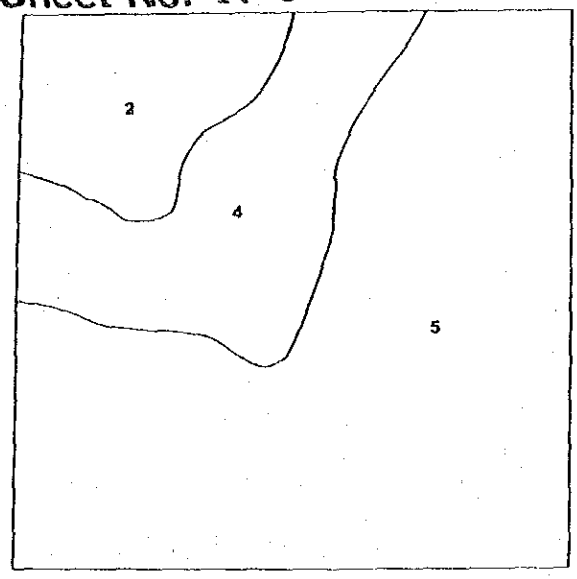


(Water covered area)

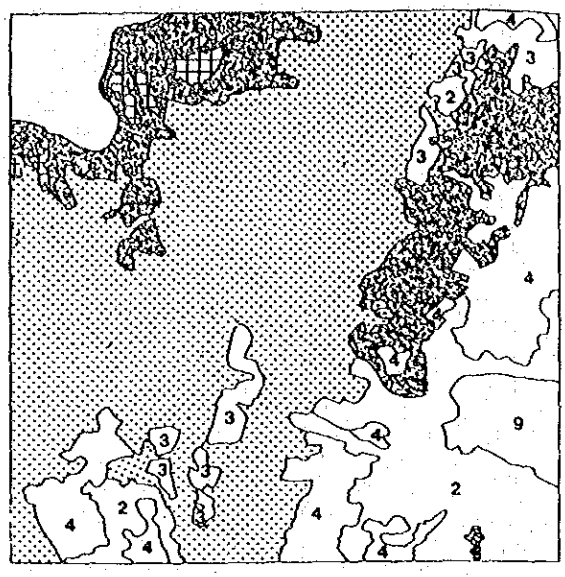
The area of landuse(Vegetation)		(Km²)
	Forest	0.3
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	11.8
	Paddy field in rainy season	0.4
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.2
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

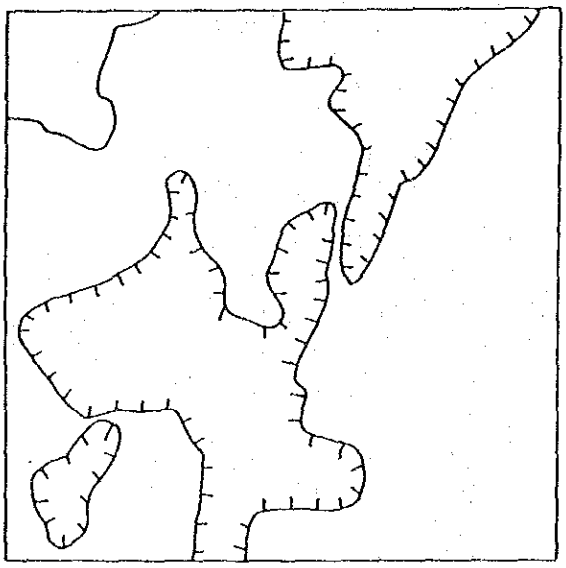
Sheet No. IV-3



(Landform)



(Landuse.Vegetation)

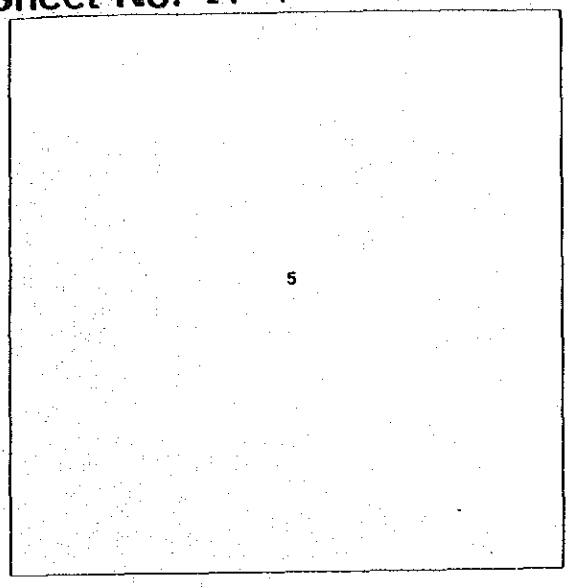


(Water covered area)

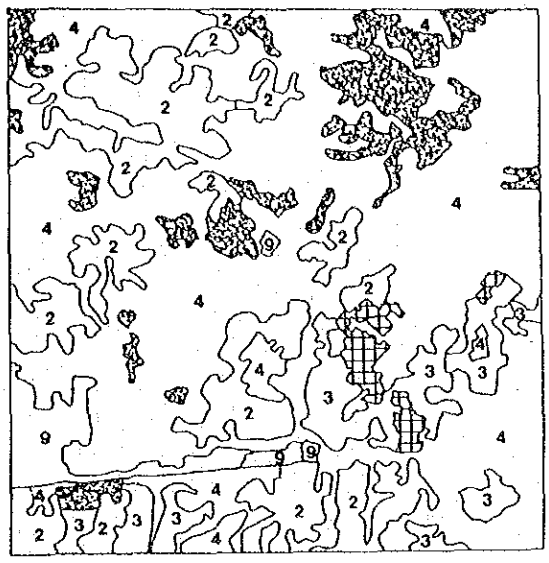
The area of landuse(Vegetation)		(Km²)
1	Forest	4.7
2	Shrub	4 5
3	Tall humidiherbosa	0.2
4	Short humidiherbosa	2.3
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	18.6
	Paddy field in rainy season	0.2
9	Fallow paddy field	2.7
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	1.3
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation	1	Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season			In rainy season		

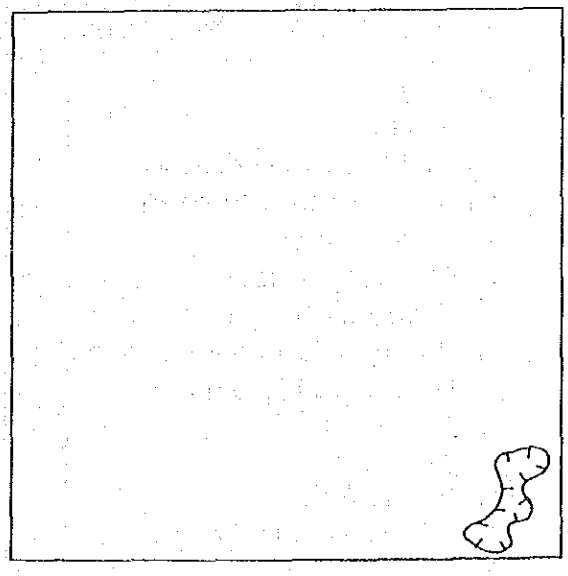
Sheet No. IV-4



(Landform)



(Landuse. Vegetation)

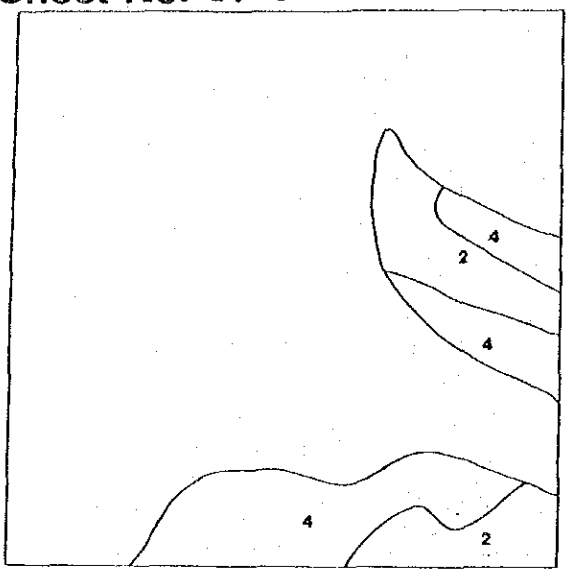


(Water covered area)

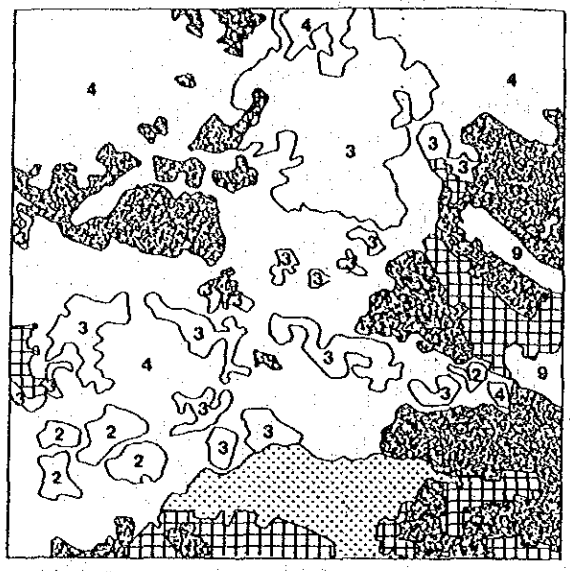
The area of landuse(Vegetation)		(Km²)
	Forest	1.9
2	Shrub	5.4
3	Tall humidiherbosa	1.3
4	Short humidiherbosa	25.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	0.1
	Paddy field in rainy season	0.2
9	Fallow paddy field	1.4
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.2
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

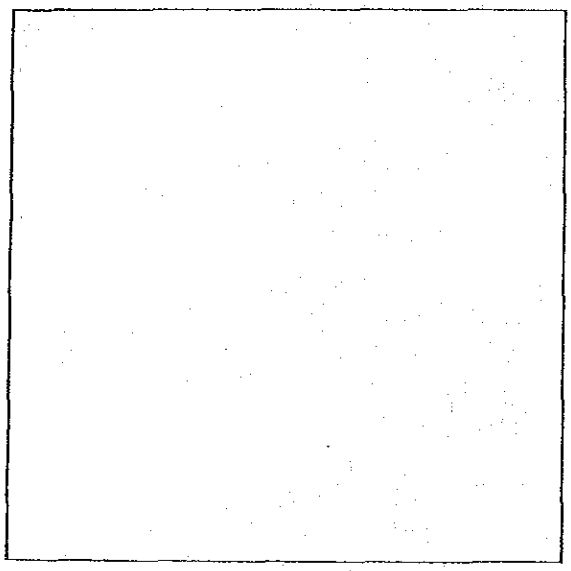
Sheet No. IV-5



(Landform)



(Landuse. Vegetation)

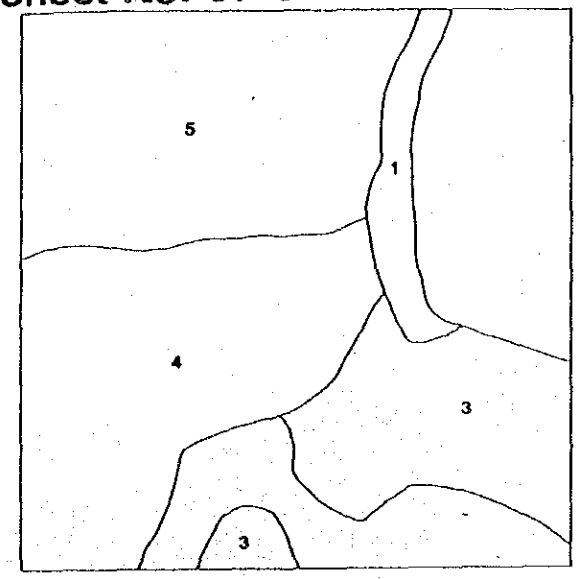


(Water covered area)

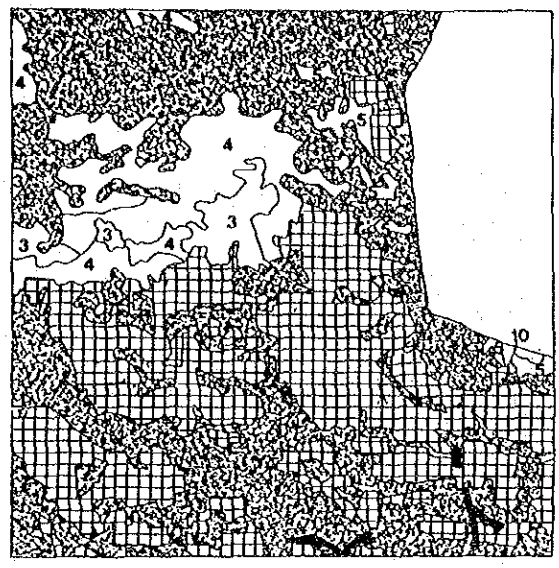
The area of landuse(Vegetation)		(Km^2)
	Forest	5.3
2	Shrub	1.2
3	Tall humidiherbosa	5.4
4	Short humidiherbosa	18.6
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	1.3
	Paddy field in rainy season	2.3
9	Fallow paddy field	1.9
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season		In rainy season			

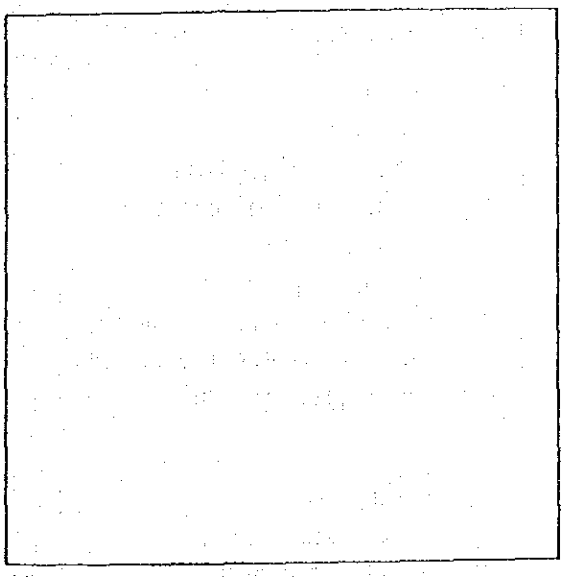
Sheet No. IV-6



(Landform)



(Landuse.Vegetation)

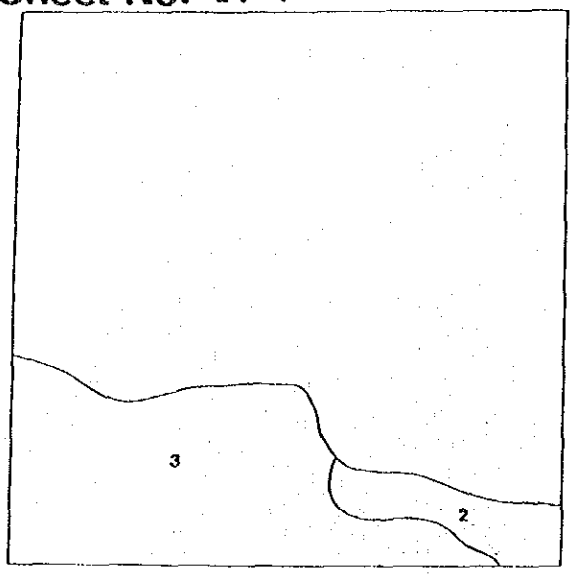


(Water covered area)

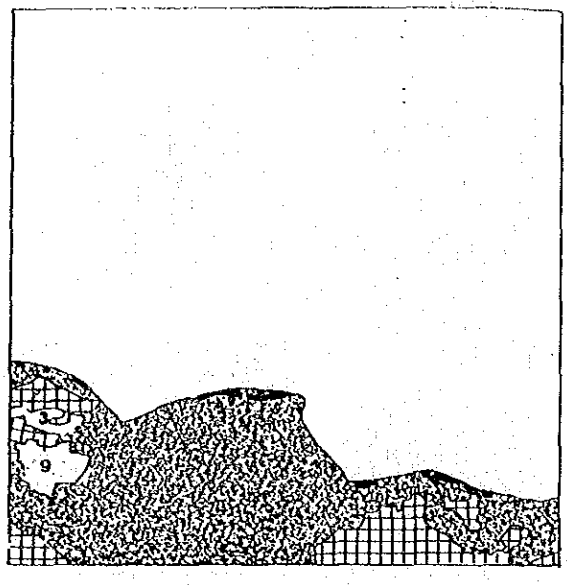
The area of landuse(Vegetation)		(Km²)
	Forest	13.2
2	Shrub	0.2
3	Tall humidiherbosa	1.3
4	Short humidiherbosa	3.4
5	Dry meadow	0.9
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	9.8
9	Fallow paddy field	0.7
10	Field	0.2
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.4
	Residential area	0.6

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

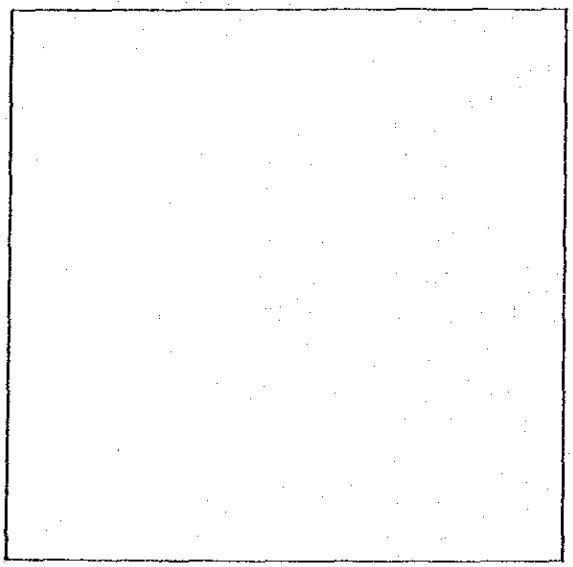
Sheet No. IV-7



(Landform)



(Landuse.Vegetation)

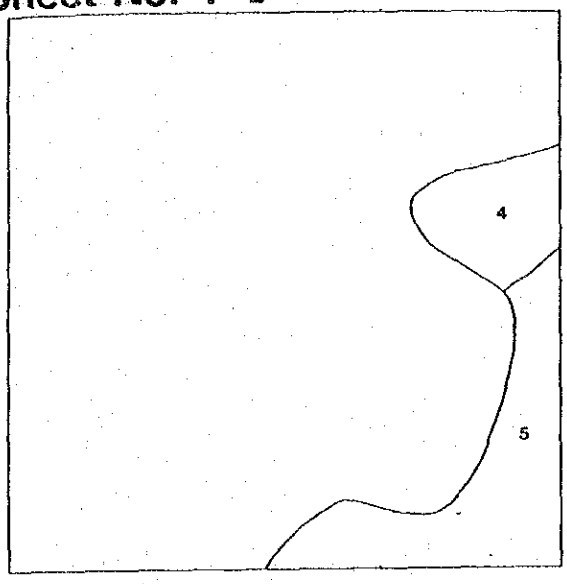


(Water covered area)

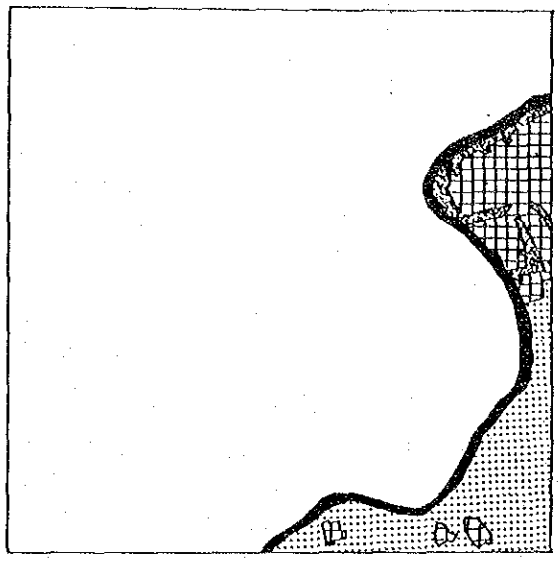
The area of landuse(Vegetation)		(Km²)
	Forest	3.2
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	4.7
9	Fallow paddy field	0.4
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	0.2

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

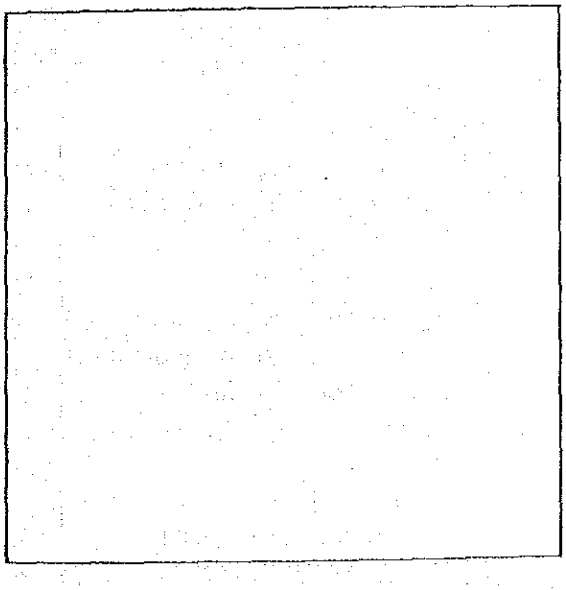
Sheet No. V-1



(Landform)



(Landuse.Vegetation)

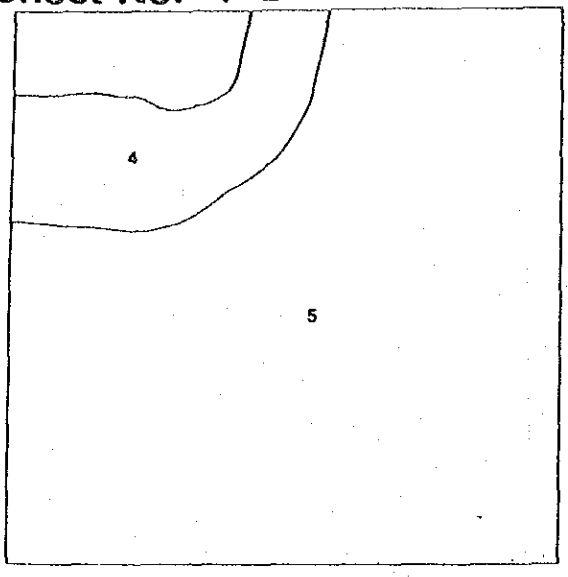


(Water covered area)

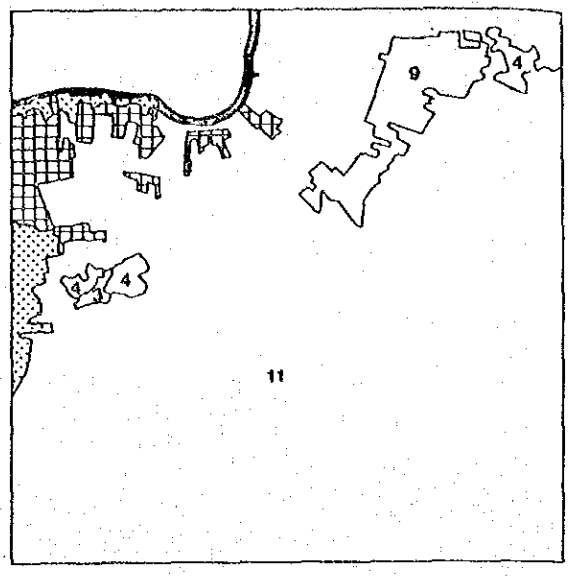
The area of landuse(Vegetation)		(Km²)
	Forest	0.4
2	Shrub	0.8
3	Tall humidiherbosa	-
4	Short humidiherbosa	0.1
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	1.2
	Paddy field in rainy season	1.2
9	Fallow paddy field	0.3
10	Field	-
11	Pasture	0.4
12	Burnt field	-
13	Water covered area	0.3
	Residential area	0.4

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

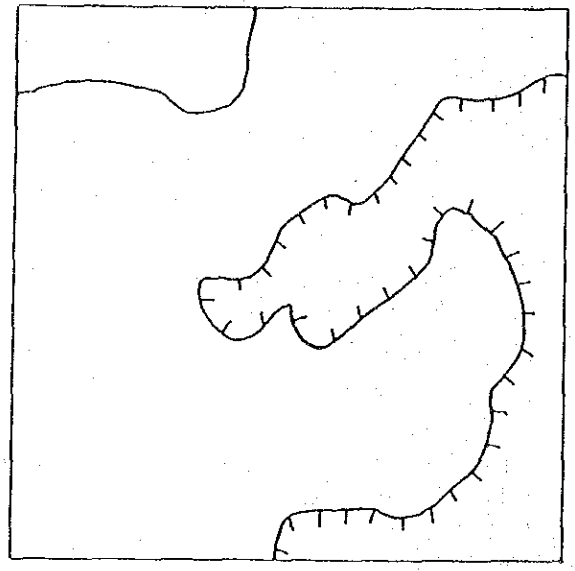
Sheet No. V-2



(Landform)



(Landuse. Vegetation)

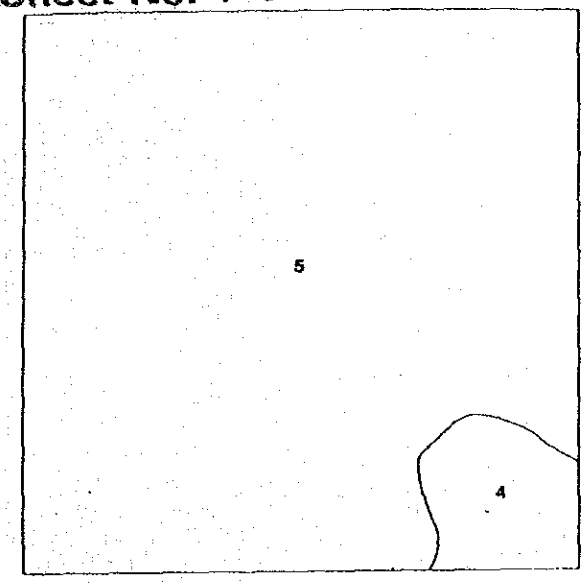


(Water covered area)

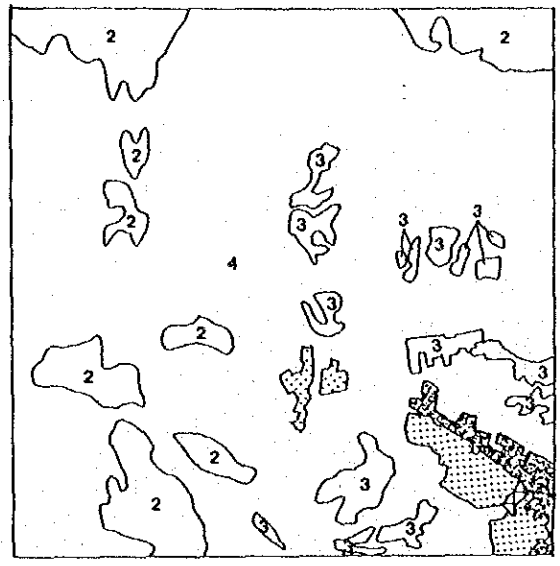
The area of landuse(Vegetation)		(Km²)
	Forest	0.4
2	Shrub	0.9
3	Tall humidiherbosa	0.3
4	Short humidiherbosa	0.7
5	Dry meadow	0.1
6	Floating grass	0.1
	Paddy field in dry season	5.8
	Paddy field in rainy season	1.0
9	Fallow paddy field	1.9
10	Field	-
11	Pasture	21.7
12	Burnt field	0.1
13	Water covered area	0.5
	Residential area	0.1

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season			In rainy season		

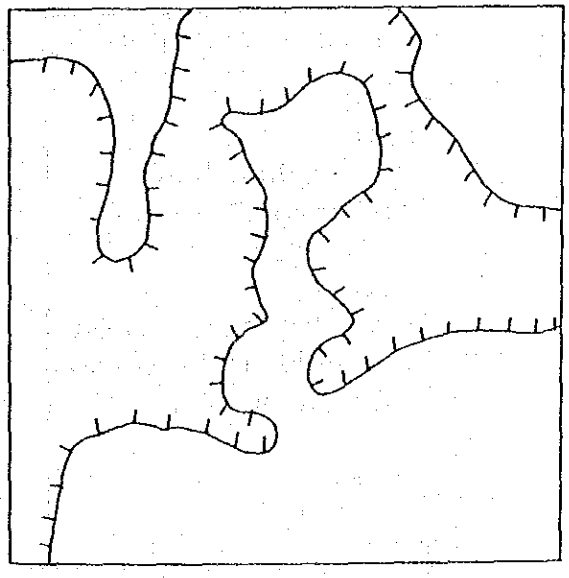
Sheet No. V-3



(Landform)



(Landuse. Vegetation)

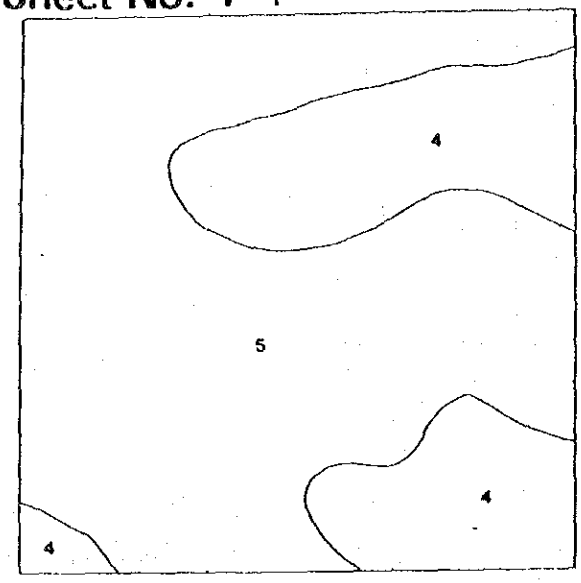


(Water covered area)

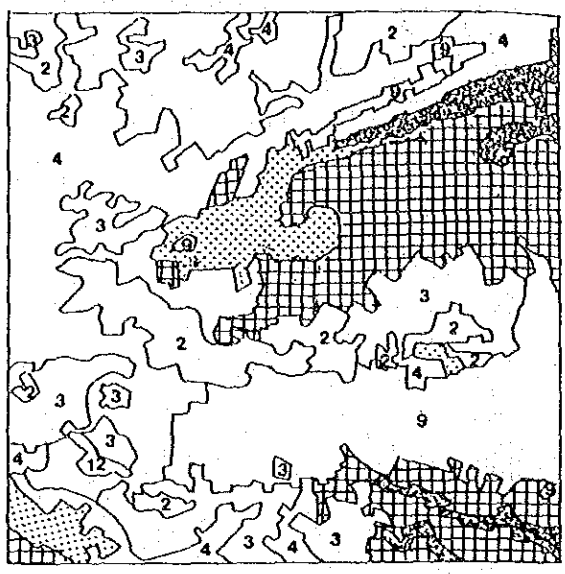
The area of landuse(Vegetation)		(Km²)
	Forest	0.6
2	Shrub	4.6
3	Tall humidiherbosa	2.3
4	Short humidiherbosa	16.2
5	Dry meadow	-
6	Floating grass	0.9
	Paddy field in dry season	2.9
	Paddy field in rainy season	0.1
9	Fallow paddy field	0.3
10	Field	-
11	Pasture	6.8
12	Burnt field	0.1
13	Water covered area	0.9
	Residential area	0.3

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

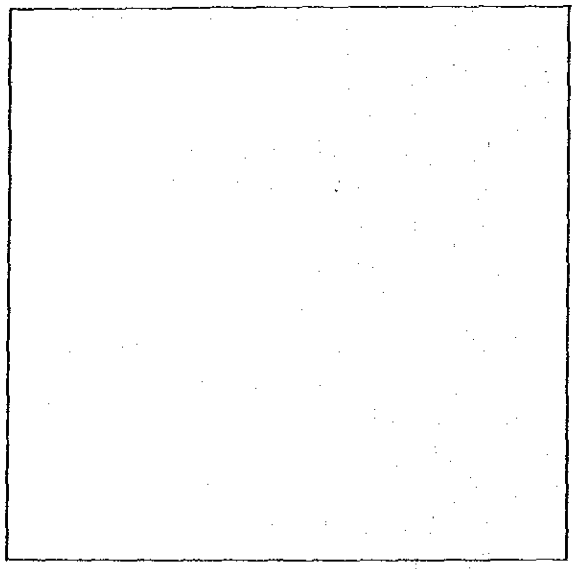
Sheet No. V-4



(Landform)



(Landuse.Vegetation)

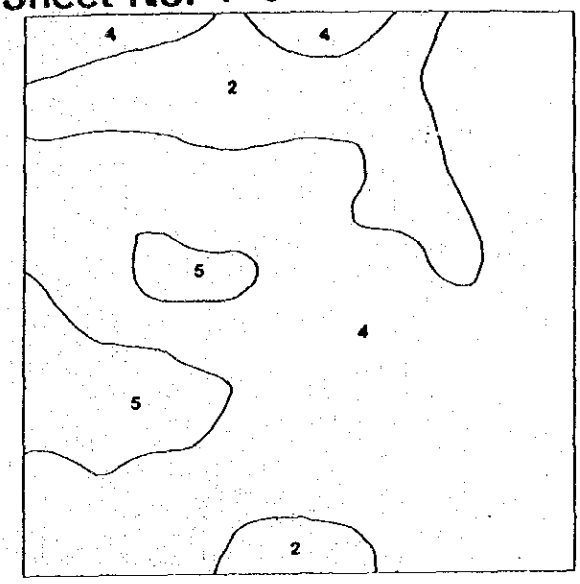


(Water covered area)

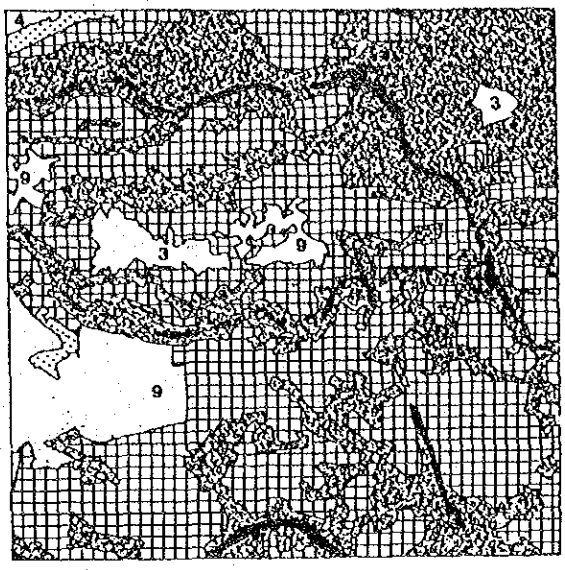
The area of landuse(Vegetation)		(Km²)
1	Forest	2.0
2	Shrub	7.1
3	Tall humidiherbosa	5.1
4	Short humidiherbosa	6.6
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	3.1
	Paddy field in rainy season	4.3
9	Fallow paddy field	7.4
10	Field	-
11	Pasture	-
12	Burnt field	0.1
13	Water covered area	0.1
	Residential area	0.2

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation	1	Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

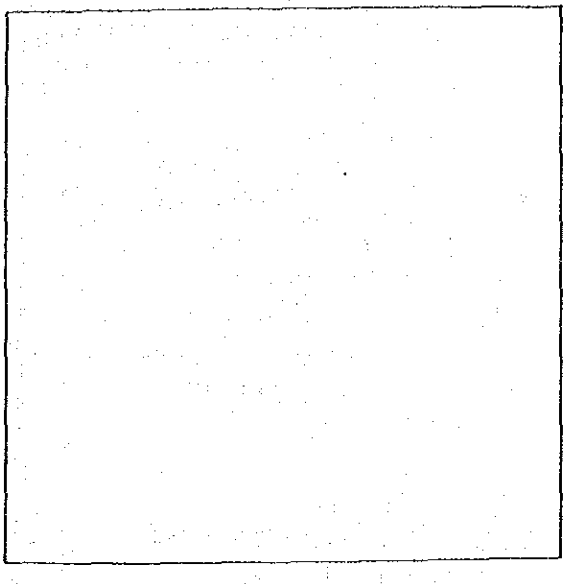
Sheet No. V-5



(Landform)



(Landuse. Vegetation)

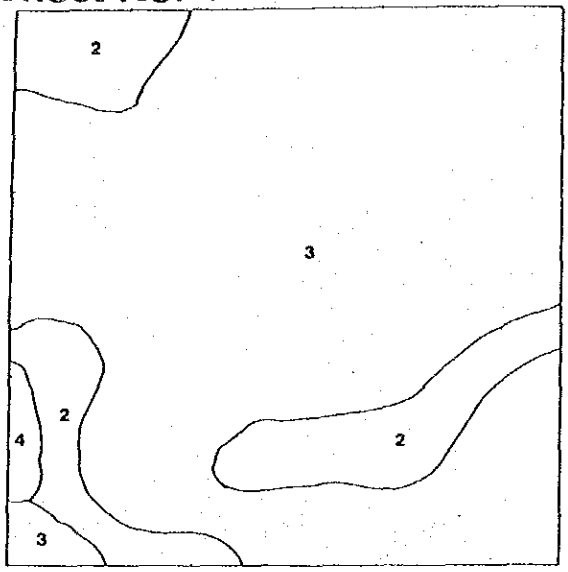


(Water covered area)

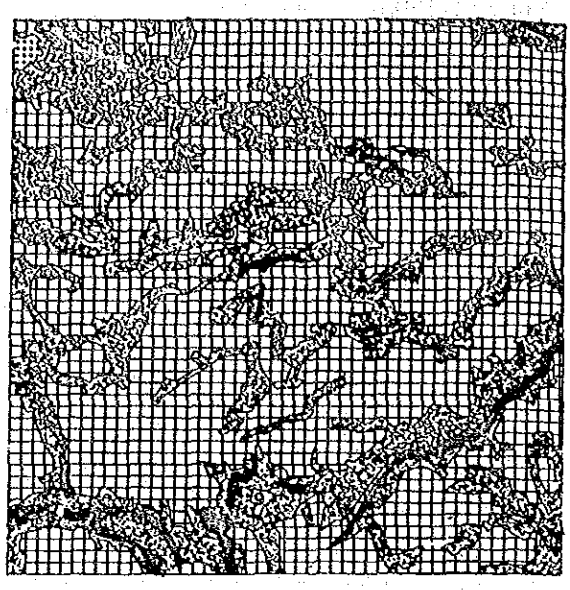
The area of landuse(Vegetation)		(Km²)
	Forest	12.4
2	Shrub	-
3	Tall humidiherbosa	1.1
4	Short humidiherbosa	0.1
5	Dry meadow	0.1
6	Floating grass	-
	Paddy field in dry season	1.7
	Paddy field in rainy season	16.4
9	Fallow paddy field	2.6
10	Field	0.2
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.1
	Residential area	1.3

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

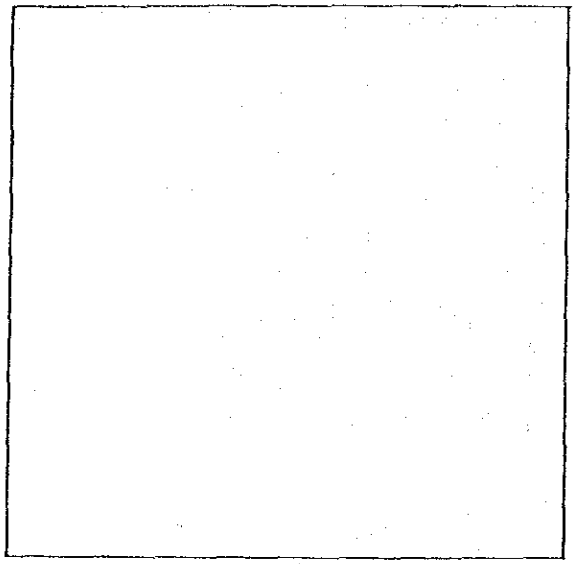
Sheet No. V-6



(Landform)



(Landuse.Vegetation)

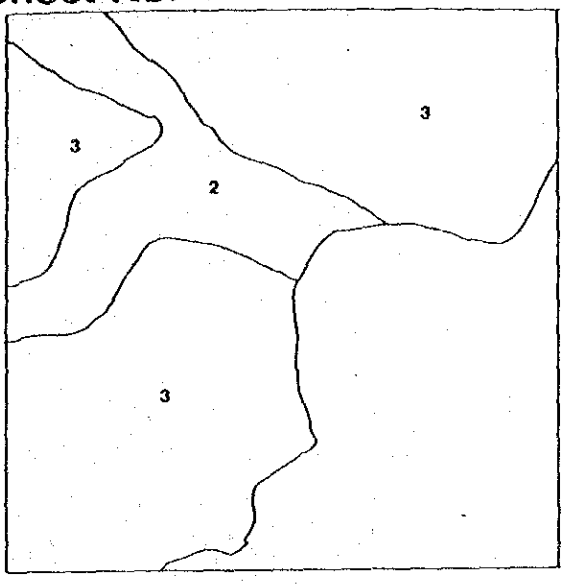


(Water covered area)

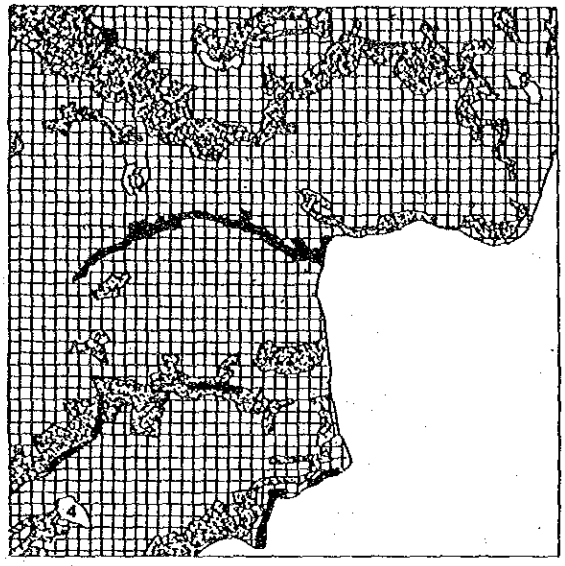
The area of landuse(Vegetation)		(Km²)
	Forest	3.7
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	0.1
	Paddy field in rainy season	32.0
9	Fallow paddy field	0.1
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.1
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

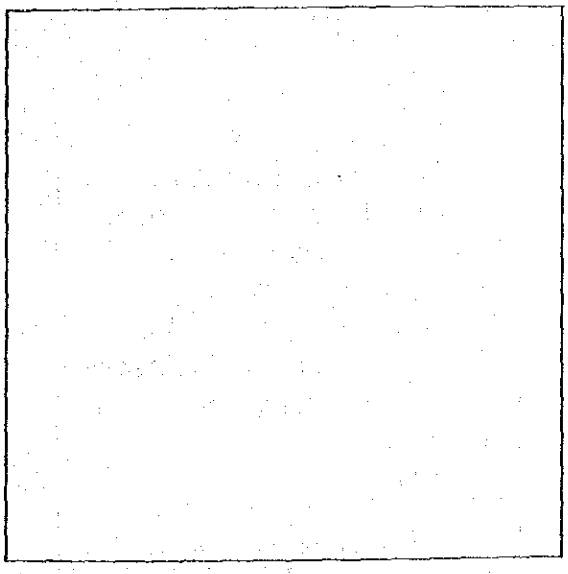
Sheet No. V-7



(Landform)



(Landuse. Vegetation)

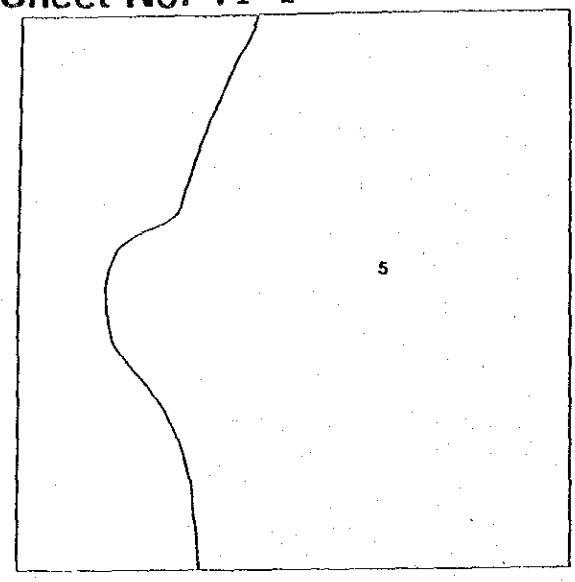


(Water covered area)

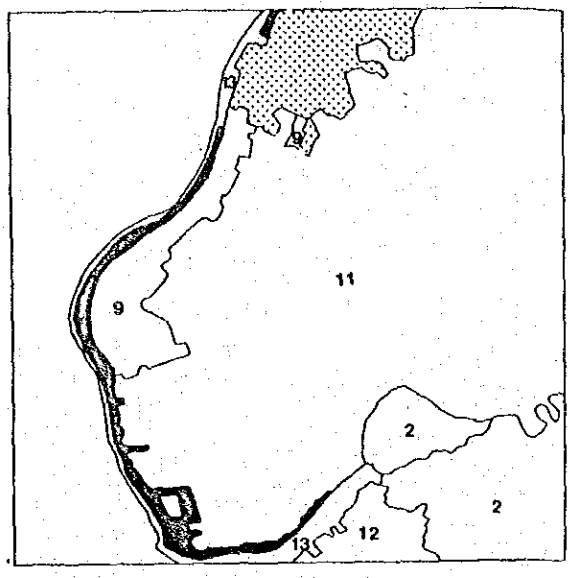
The area of landuse(Vegetation)		(Km²)
	Forest	1.8
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	24.4
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.2
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

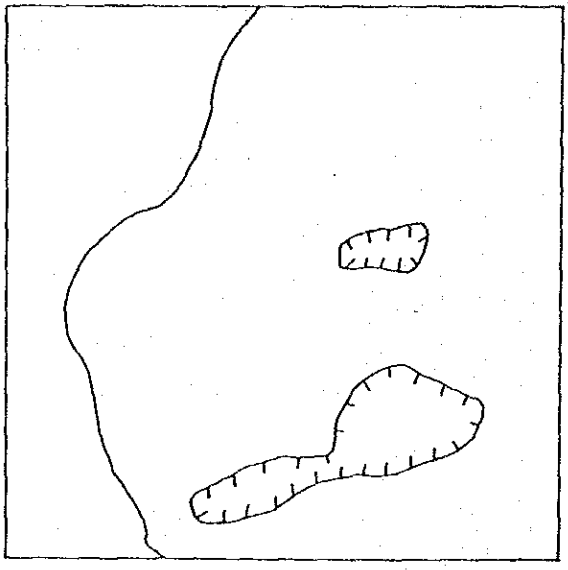
Sheet No. VI-1



(Landform)



(Landuse.Vegetation)

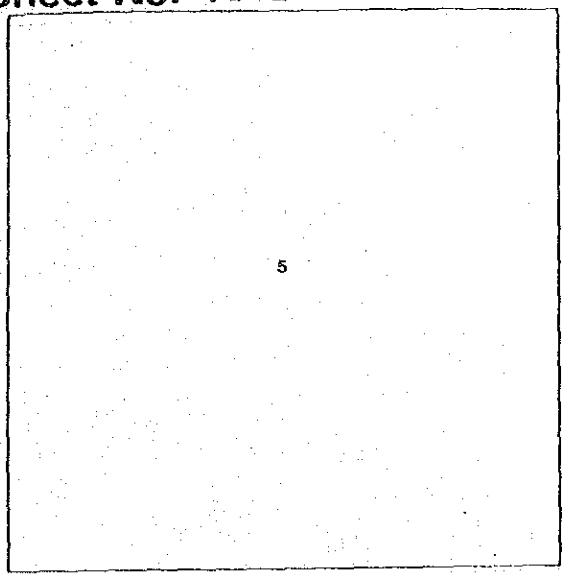


(Water covered area)

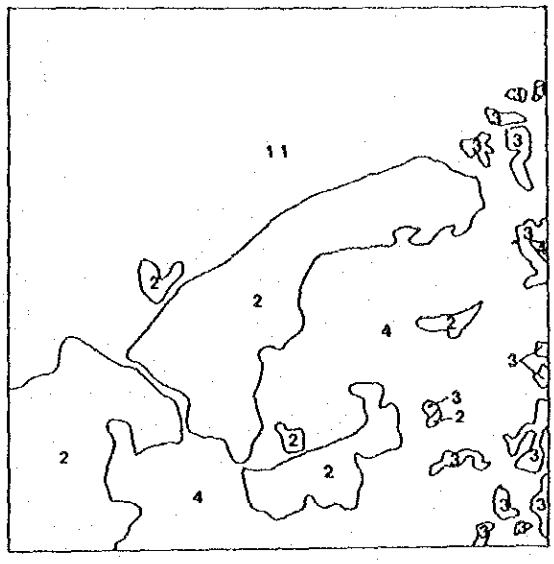
The area of landuse(Vegetation)		(Km²)
	Forest	0.1
2	Shrub	2.2
3	Tall humidiherbosa	-
4	Short humidiherbosa	0.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	3.8
	Paddy field in rainy season	-
9	Fallow paddy field	2.1
10	Field	-
11	Pasture	17.1
12	Burnt field	-
13	Water covered area	0.8
	Residential area	0.1

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

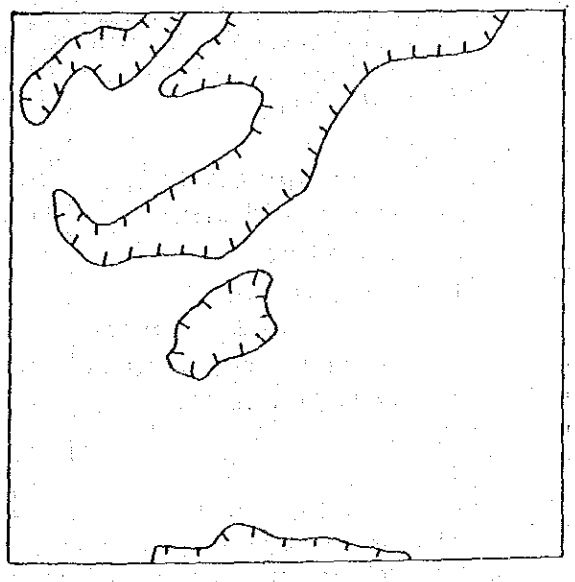
Sheet No. VI-2



(Landform)



(Landuse. Vegetation)

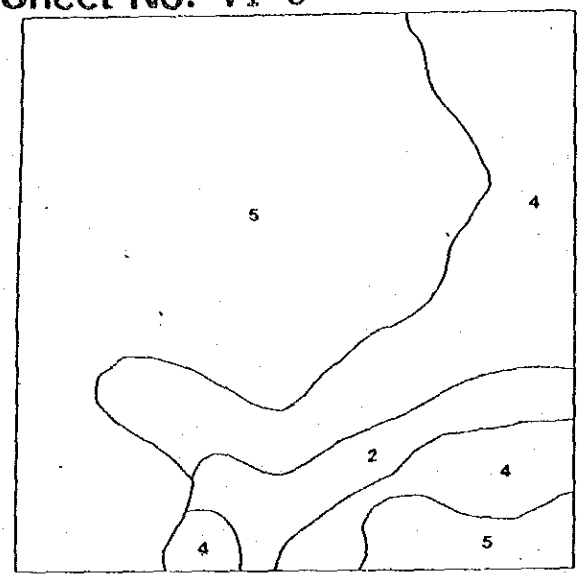


(Water covered area)

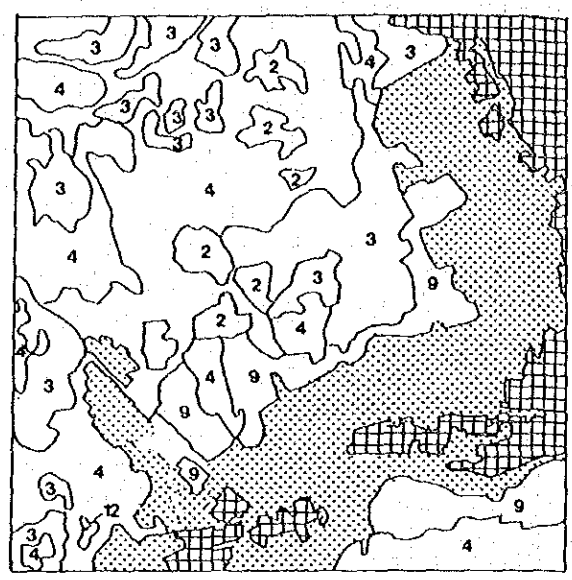
The area of landuse(Vegetation)		(Km²)
	Forest	-
2	Shrub	6.7
3	Tall humidiherbosa	0.2
4	Short humidiherbosa	13.0
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	0.4
	Paddy field in rainy season	-
9	Fallow paddy field	-
10	Field	-
11	Pasture	14.5
12	Burnt field	-
13	Water covered area	1.2
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

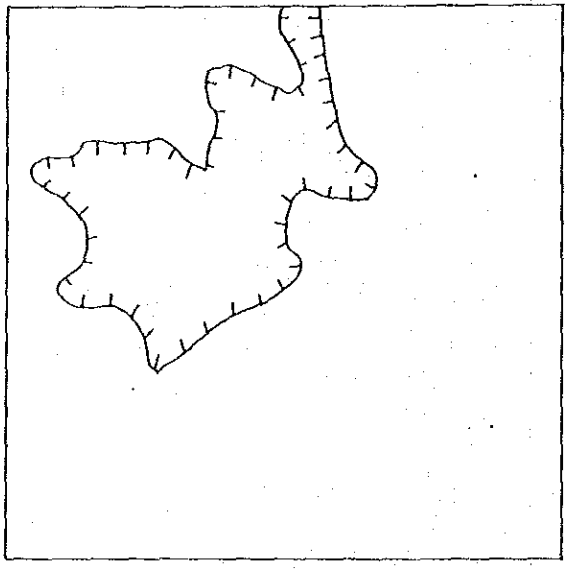
Sheet No. VI-3



(Landform)



(Landuse.Vegetation)



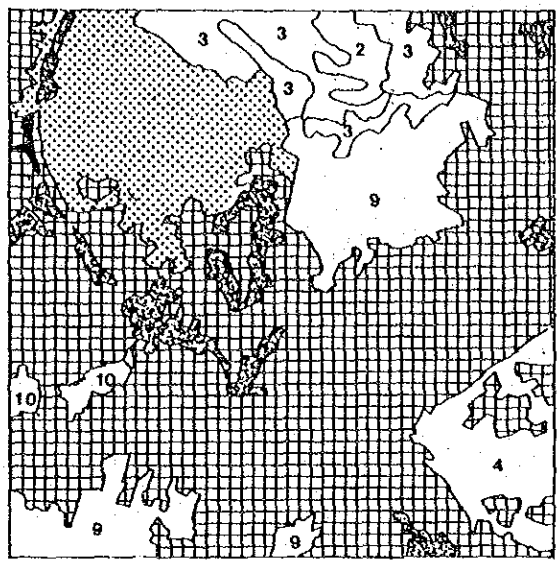
(Water covered area)

The area of landuse(Vegetation)		(Km²)
1	Forest	0.3
2	Shrub	2.6
3	Tall humidiherbosa	3.0
4	Short humidiherbosa	11.0
5	Dry meadow	-
6	Floating grass	0.1
	Paddy field in dry season	11.5
	Paddy field in rainy season	2.1
9	Fallow paddy field	4.9
10	Field	-
11	Pasture	0.1
12	Burnt field	0.2
13	Water covered area	0.2
	Residential area	-

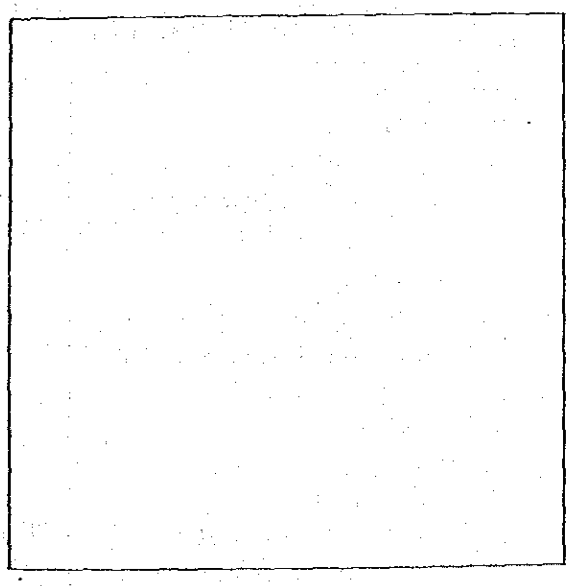
Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation	1	Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

Sheet No. VI-4

(Landform)



(Landuse.Vegetation)

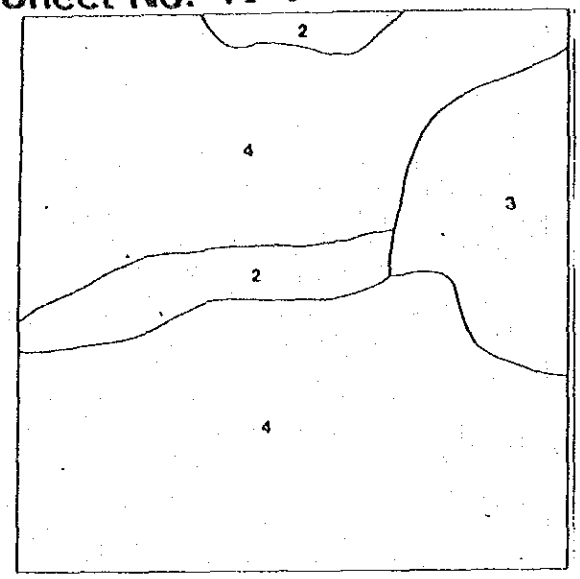


(Water covered area)

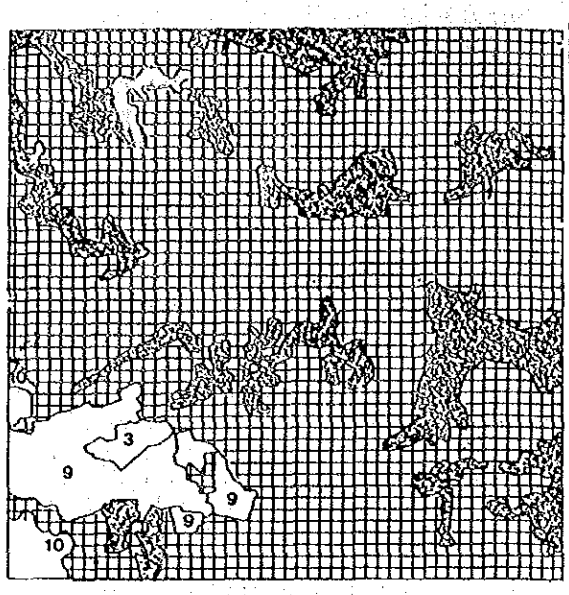
The area of landuse(Vegetation)		(Km²)
	Forest	5.4
2	Shrub	0.6
3	Tall humidiherbosa	0.8
4	Short humidiherbosa	1.2
5	Dry meadow	1.0
6	Floating grass	-
	Paddy field in dry season	3.4
	Paddy field in rainy season	16.7
9	Fallow paddy field	5.0
10	Field	0.7
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.3
	Residential area	0.9

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

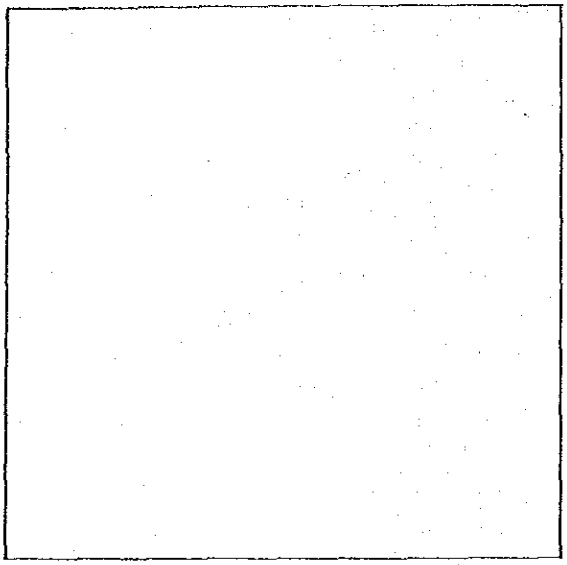
Sheet No. VI-5



(Landform)



(Landuse.Vegetation)

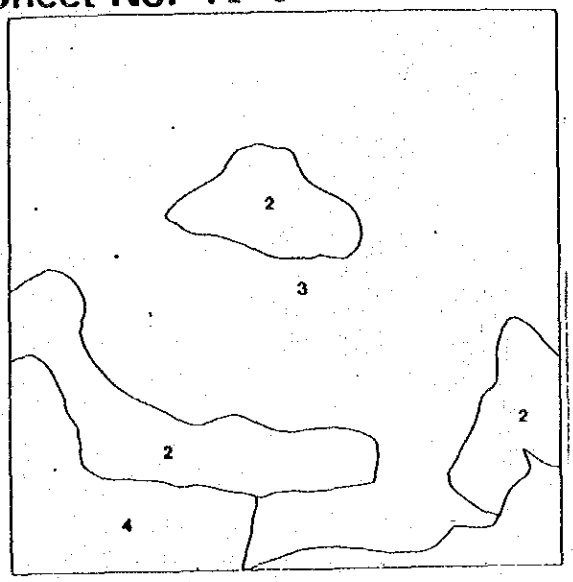


(Water covered area)

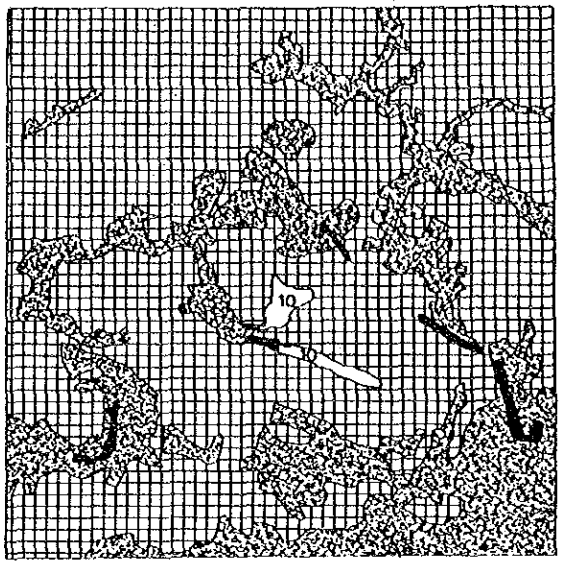
The area of landuse(Vegetation)		(Km²)
	Forest	10.3
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	0.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	0.2
	Paddy field in rainy season	20.0
9	Fallow paddy field	2.2
10	Field	0.8
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.3
	Residential area	1.7

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

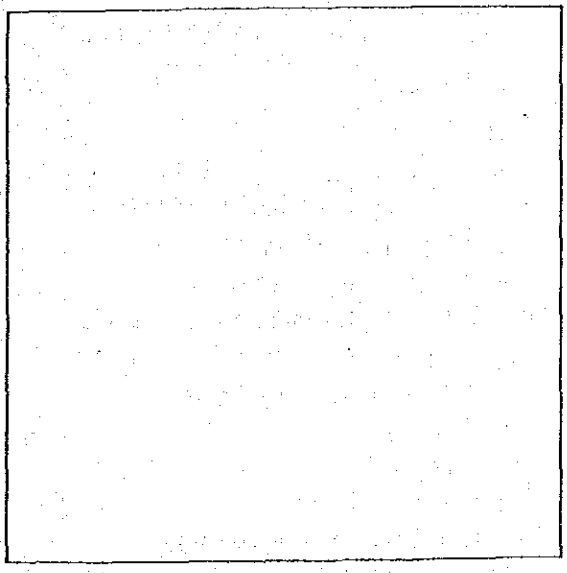
Sheet No. VI-6



(Landform)



(Landuse. Vegetation)

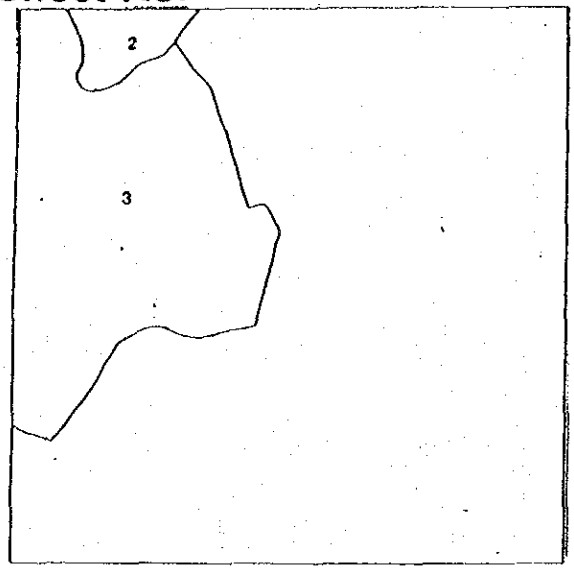


(Water covered area)

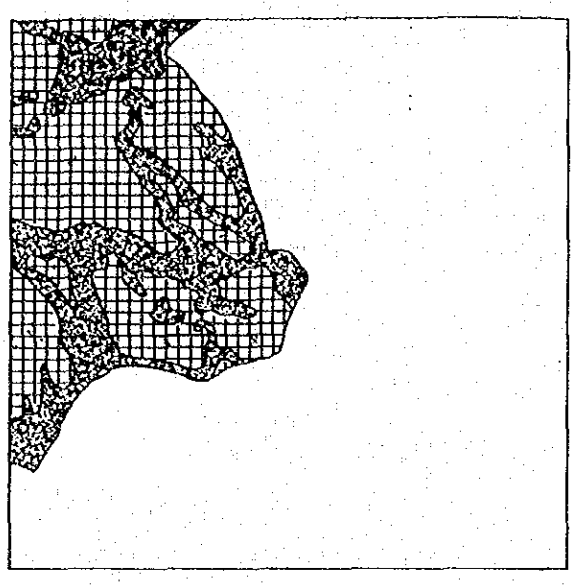
The area of landuse(Vegetation)		(Km^2)
	Forest	5.3
2	Shrub	–
3	Tall humidiherbosa	–
4	Short humidiherbosa	–
5	Dry meadow	0.2
6	Floating grass	–
	Paddy field in dry season	–
	Paddy field in rainy season	27.7
9	Fallow paddy field	–
10	Field	0.7
11	Pasture	–
12	Burnt field	–
13	Water covered area	0.2
	Residential area	0.6

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

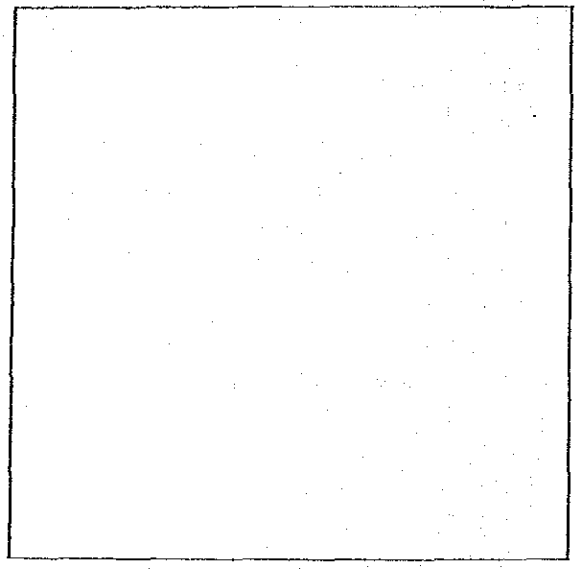
Sheet No. VI-7



(Landform)



(Landuse.Vegetation)

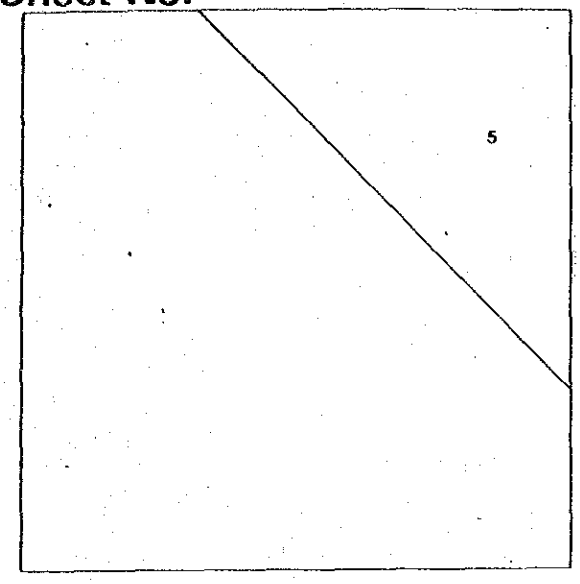


(Water covered area)

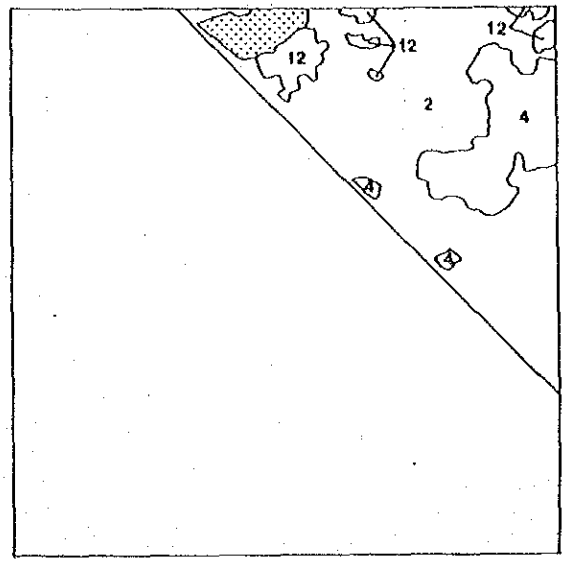
The area of landuse(Vegetation)		(Km²)
	Forest	3.3
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	6.1
9	Fallow paddy field	-
10	Field	0.2
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.1
	Residential area	0.3

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

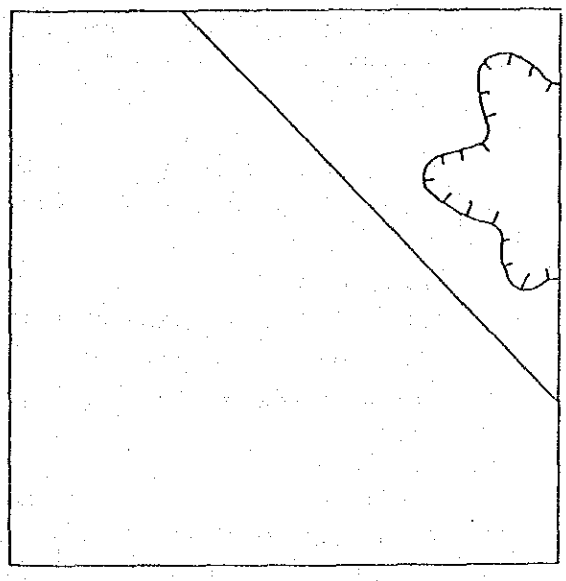
Sheet No. VII-1



(Landform)



(Landuse. Vegetation)

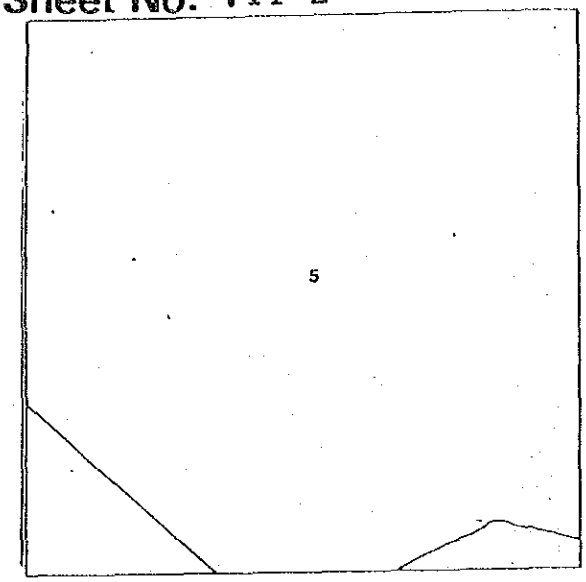


(Water covered area)

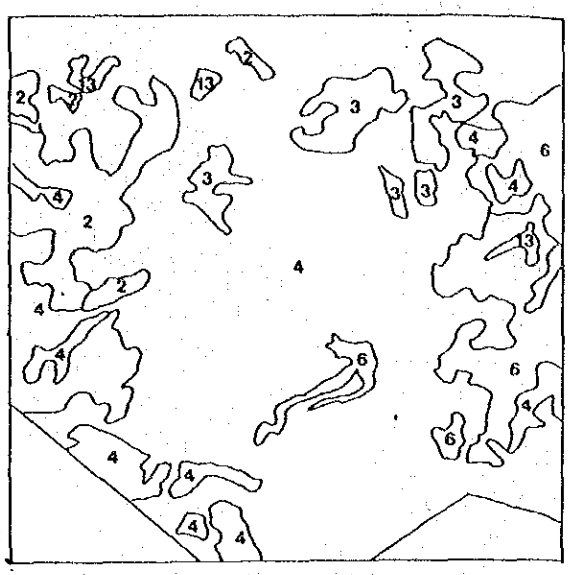
The area of landuse(Vegetation)		(Km²)
	Forest	-
2	Shrub	5.5
3	Tall humidiherbosa	-
4	Short humidiherbosa	0.3
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	0.5
9	Fallow paddy field	-
10	Field	0.1
11	Pasture	-
12	Burnt field	0.5
13	Water covered area	0.2
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

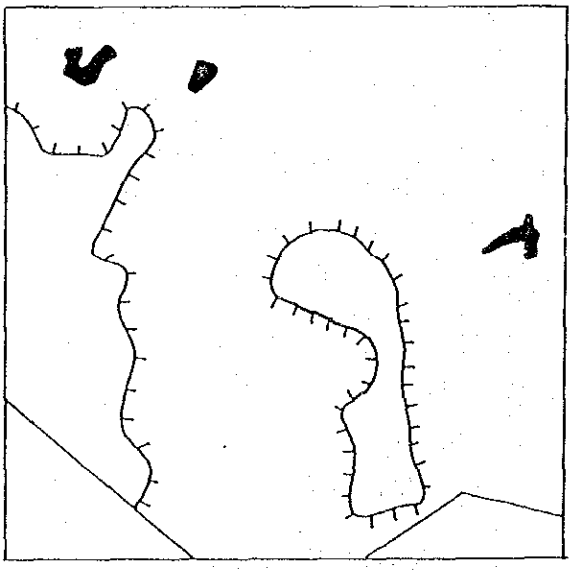
Sheet No. VII-2



(Landform)



(Landuse.Vegetation)

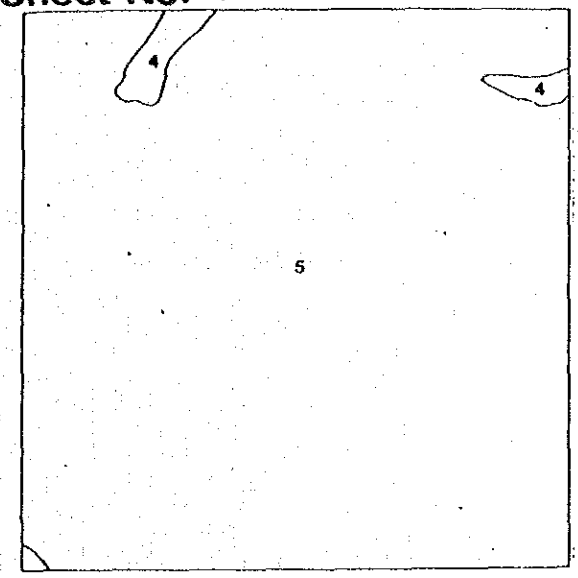


(Water covered area)

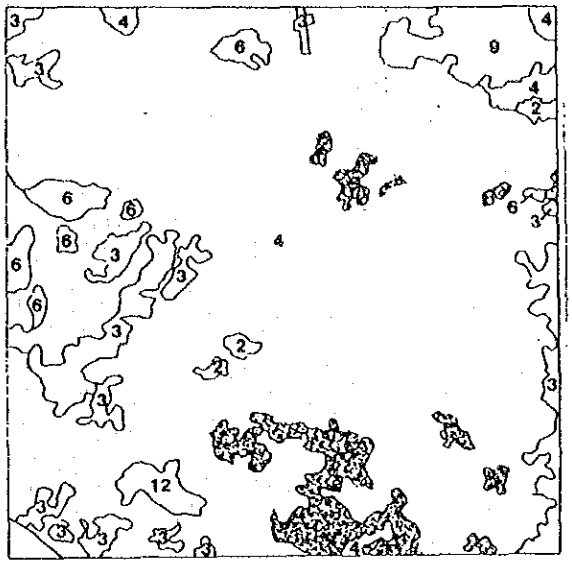
The area of landuse(Vegetation)		(Km²)
1	Forest	-
2	Shrub	6.6
3	Tall humidiherbosa	2.7
4	Short humidiherbosa	19.5
5	Dry meadow	-
6	Floating grass	2.9
	Paddy field in dry season	0.1
	Paddy field in rainy season	-
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	0.2
13	Water covered area	1.7
	Residential area	0.1

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation	1	Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

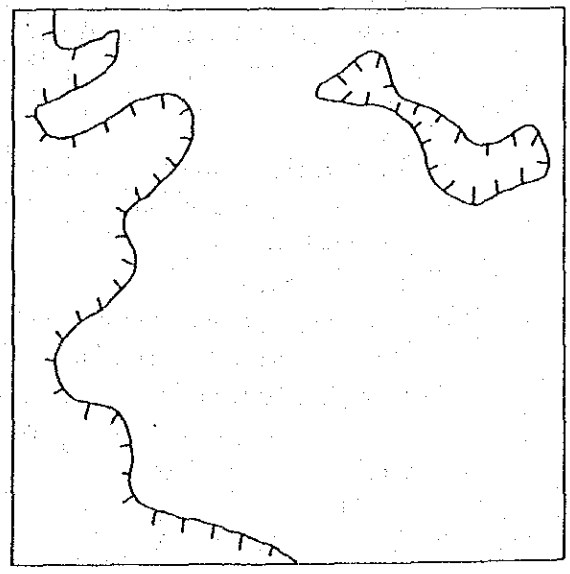
Sheet No. VII-3



(Landform)



(Landuse. Vegetation)

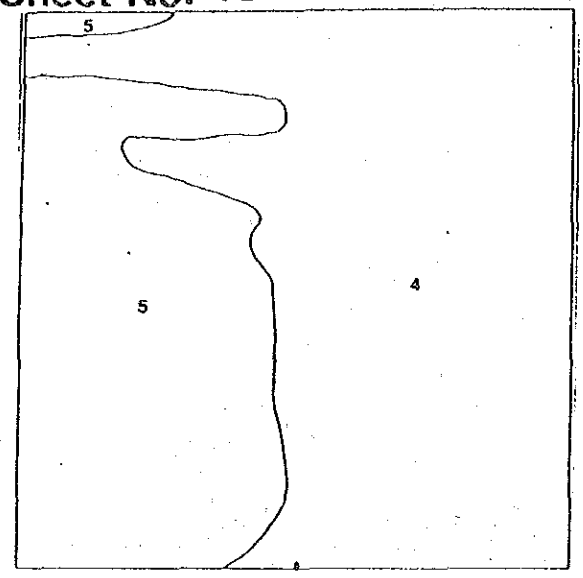


(Water covered area)

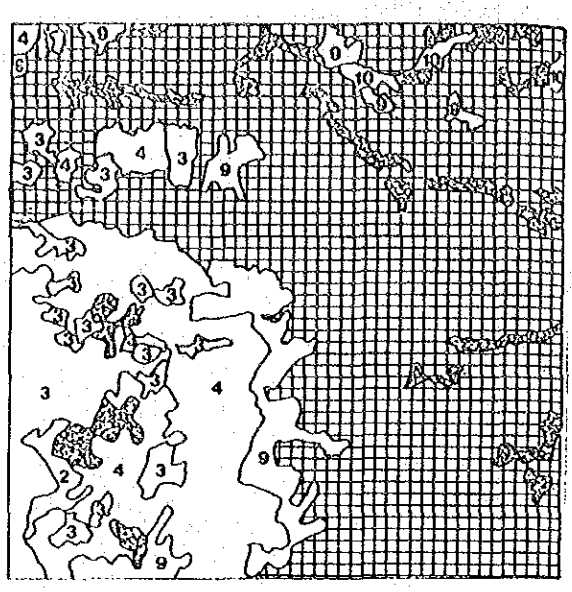
The area of landuse(Vegetation)		(Km²)
	Forest	2.4
2	Shrub	0.4
3	Tall humidiherbosa	2.6
4	Short humidiherbosa	24.2
5	Dry meadow	-
6	Floating grass	2.1
	Paddy field in dry season	1.2
	Paddy field in rainy season	0.1
9	Fallow paddy field	1.3
10	Field	-
11	Pasture	-
12	Burnt field	0.3
13	Water covered area	1.3
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

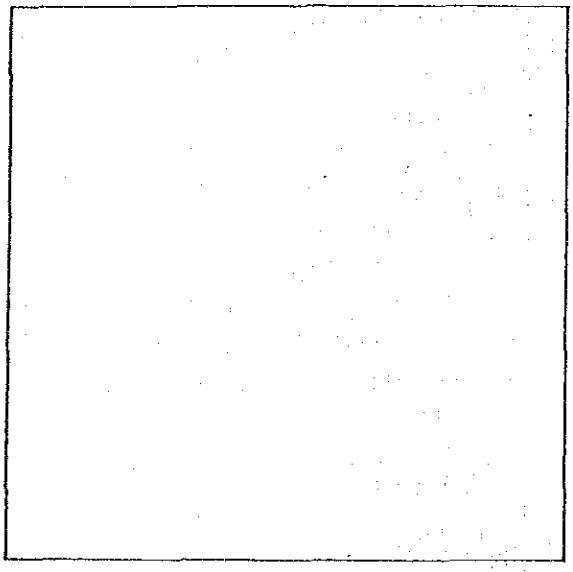
Sheet No. VII-4



(Landform)



(Landuse. Vegetation)

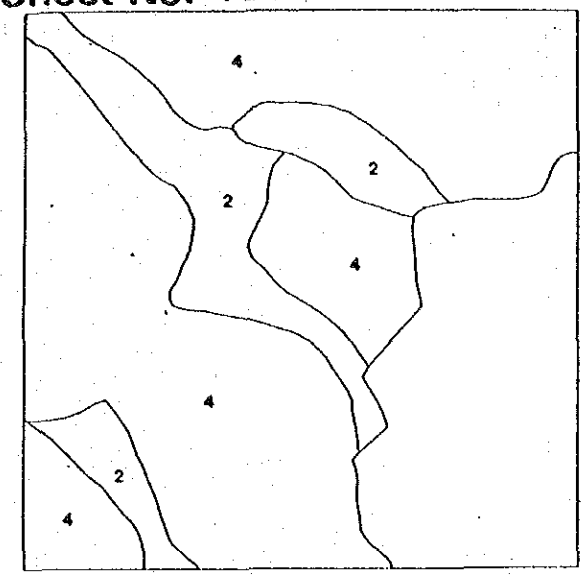


(Water covered area)

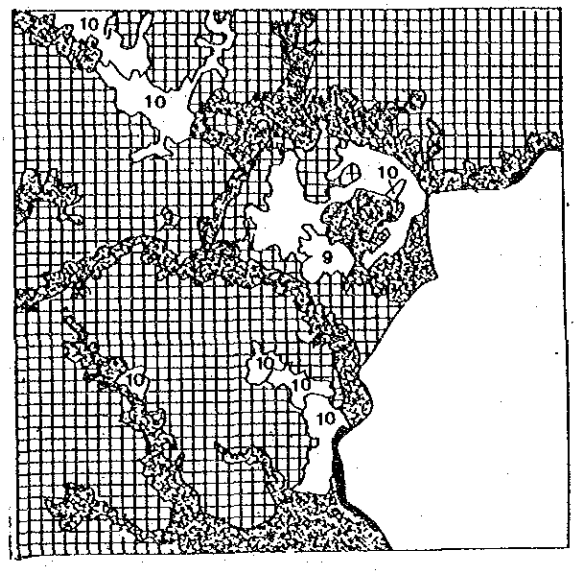
The area of landuse(Vegetation)		(Km²)
	Forest	1.9
2	Shrub	0.7
3	Tall humidiherbosa	2.3
4	Short humidiherbosa	6.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	20.2
9	Fallow paddy field	4.2
10	Field	0.2
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

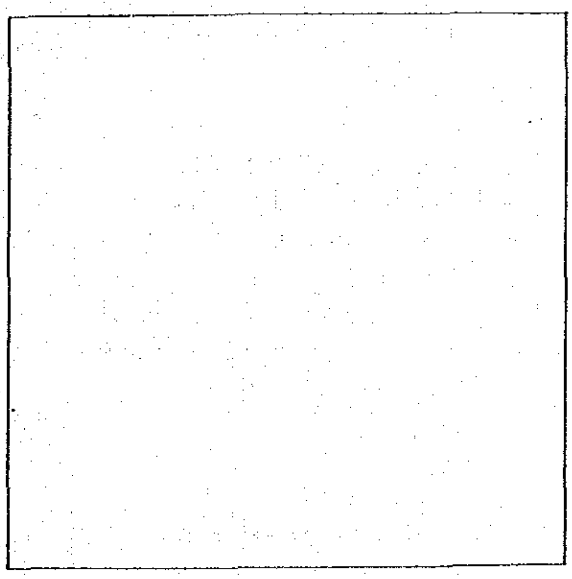
Sheet No. VII-5



(Landform)



(Landuse.Vegetation)

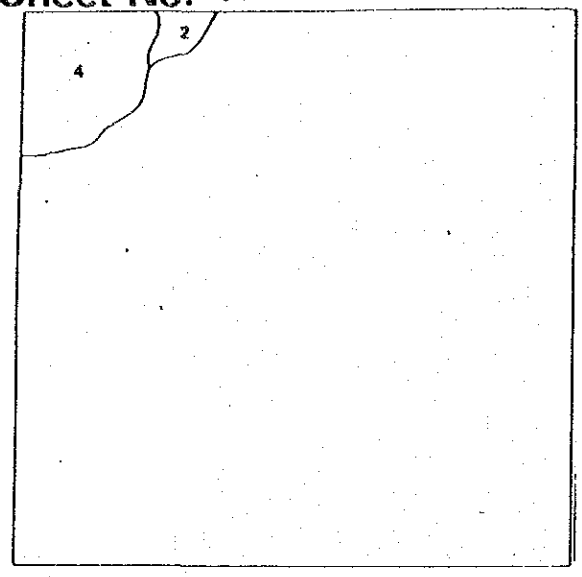


(Water covered area)

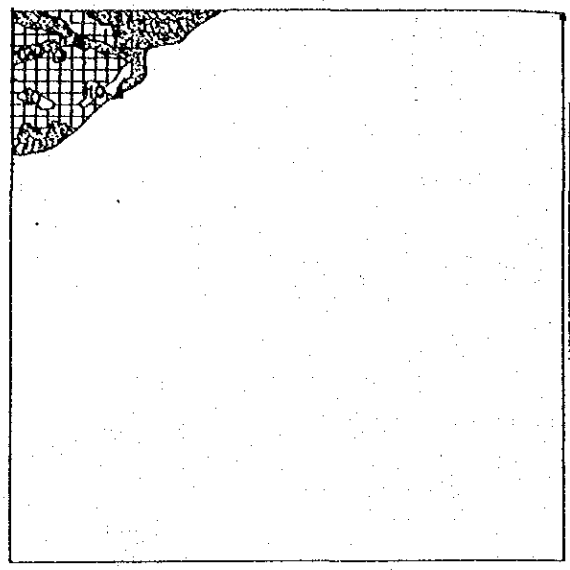
The area of landuse(Vegetation)		(Km²)
	Forest	1.8
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	24.2
9	Fallow paddy field	1.2
10	Field	1.1
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	0.1

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

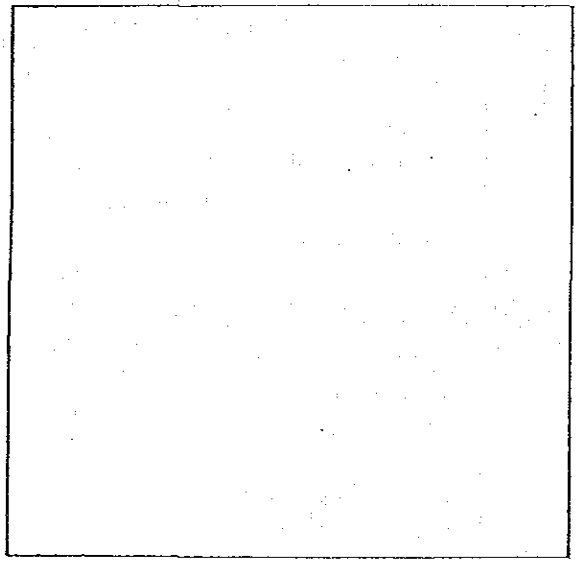
Sheet No. VII-6



(Landform)



(Landuse. Vegetation)

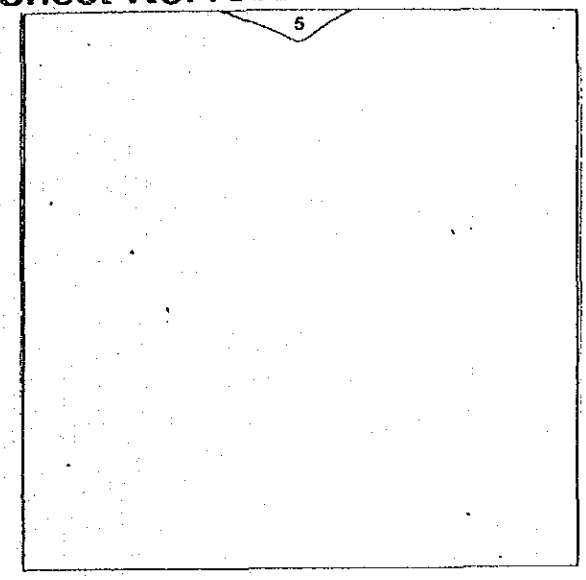


(Water covered area)

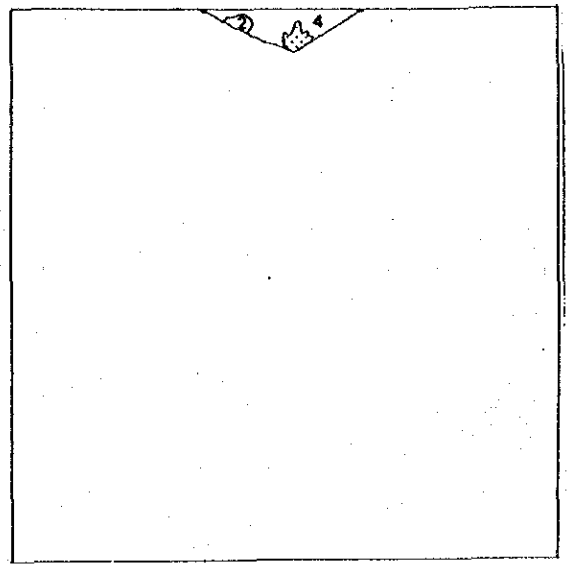
The area of landuse(Vegetation)		(Km²)
	Forest	0.4
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	1.4
9	Fallow paddy field	-
10	Field	0.1
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

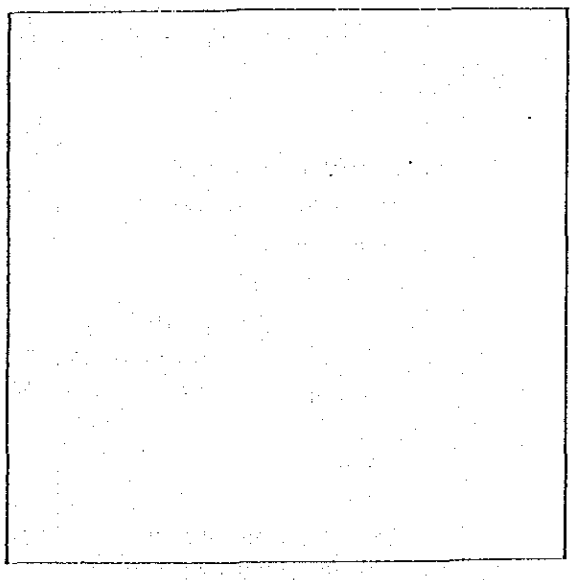
Sheet No. VIII-2



(Landform)



(Landuse. Vegetation)

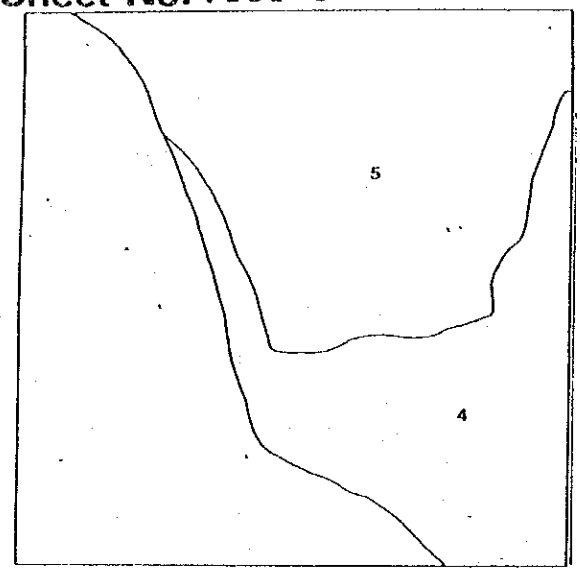


(Water covered area)

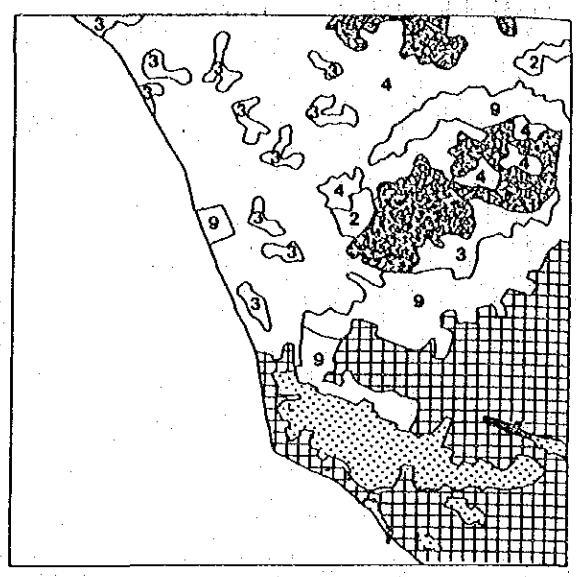
The area of landuse(Vegetation)		(Km²)
	Forest	-
2	Shrub	0.1
3	Tall humidiherbosa	-
4	Short humidiherbosa	0.1
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	0.1
	Paddy field in rainy season	-
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.1
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

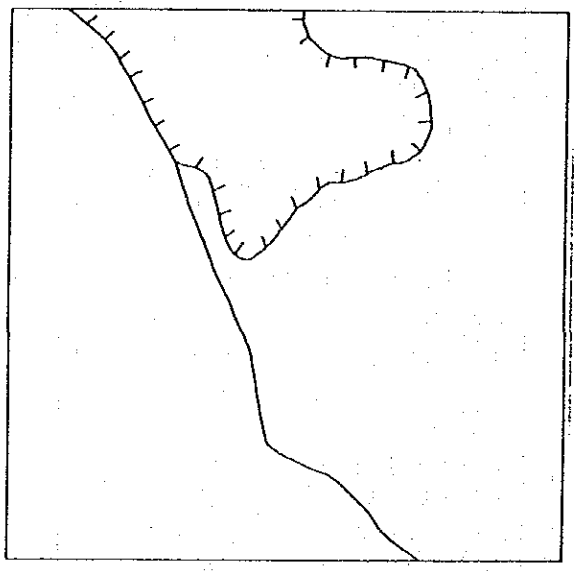
Sheet No. VIII-3



(Landform)



(Landuse. Vegetation)



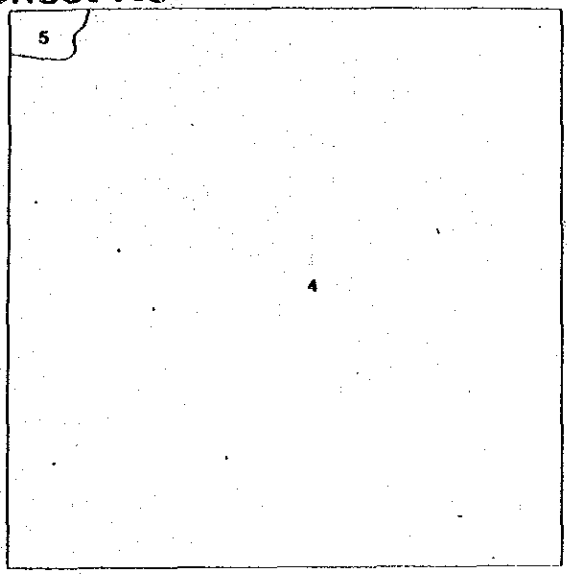
(Water covered area)

The area of landuse(Vegetation) (Km^2)

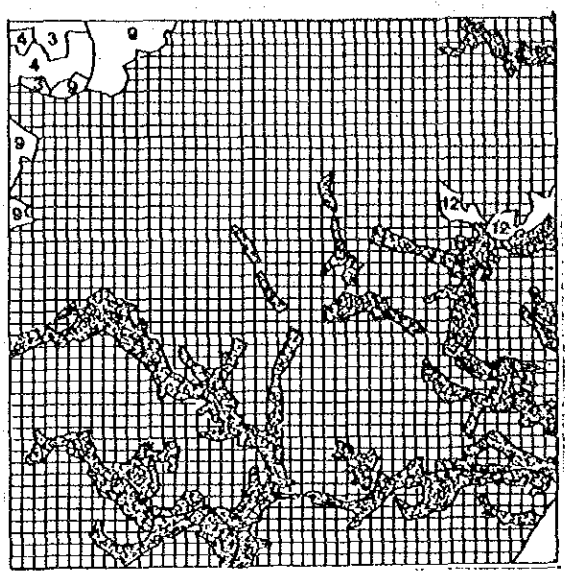
	Forest	1.7
2	Shrub	0.1
3	Tall humidiherbosa	0.3
4	Short humidiherbosa	7.0
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	1.9
	Paddy field in rainy season	7.2
9	Fallow paddy field	3.5
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.2
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

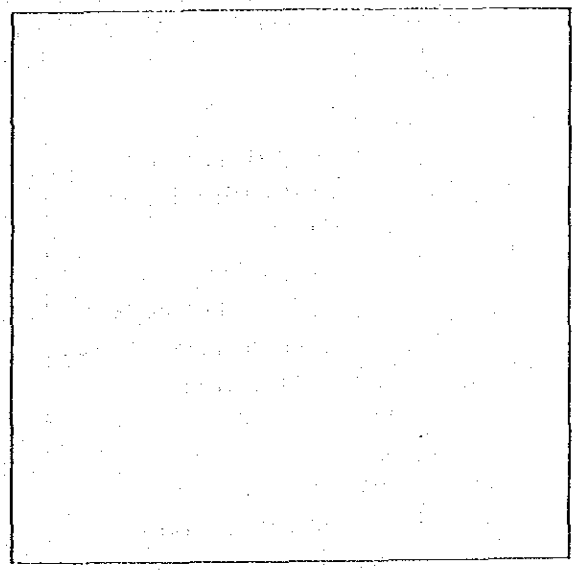
Sheet No. VIII-4



(Landform)



(Landuse.Vegetation)

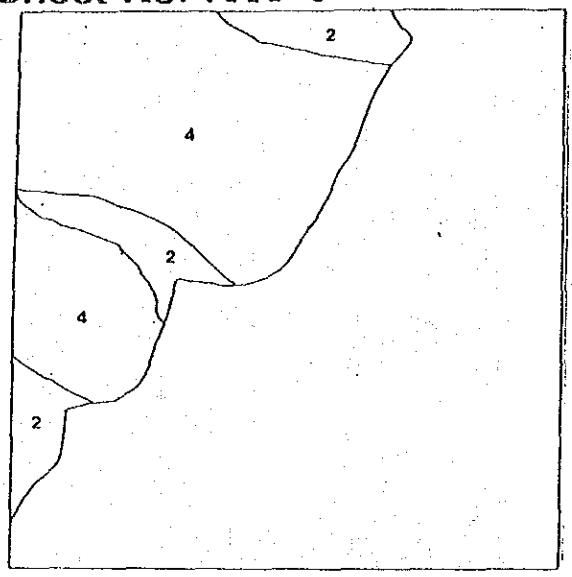


(Water covered area)

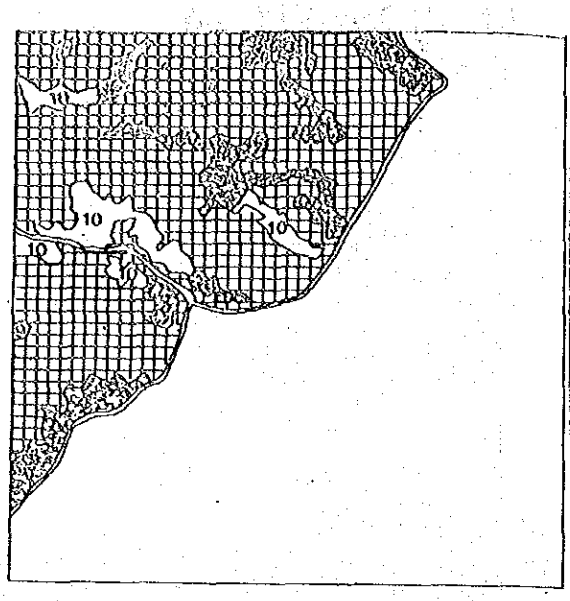
The area of landuse(Vegetation)		(Km²)
	Forest	0.9
2	Shrub	-
3	Tall humidiherbosa	0.1
4	Short humidiherbosa	0.2
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	33.5
9	Fallow paddy field	0.6
10	Field	0.5
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	0.1

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

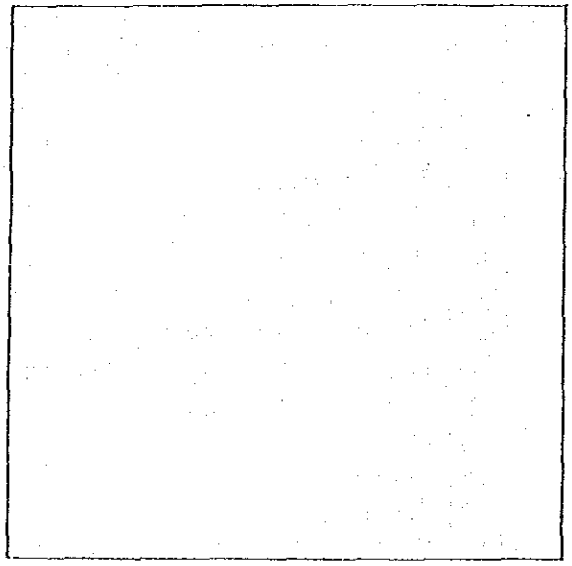
Sheet No. VIII-5



(Landform)



(Landuse.Vegetation)

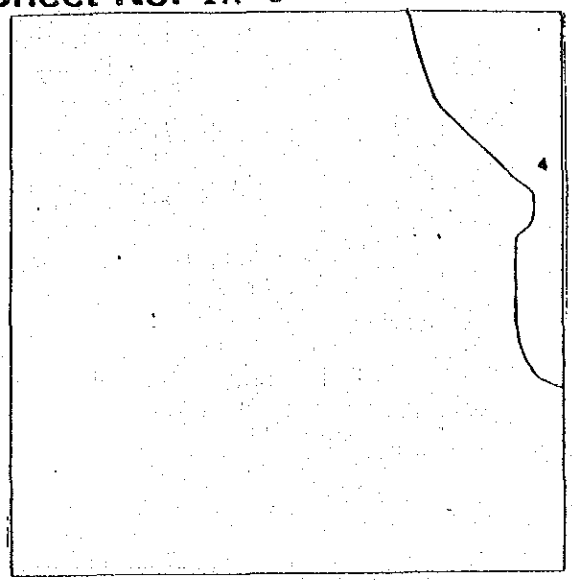


(Water covered area)

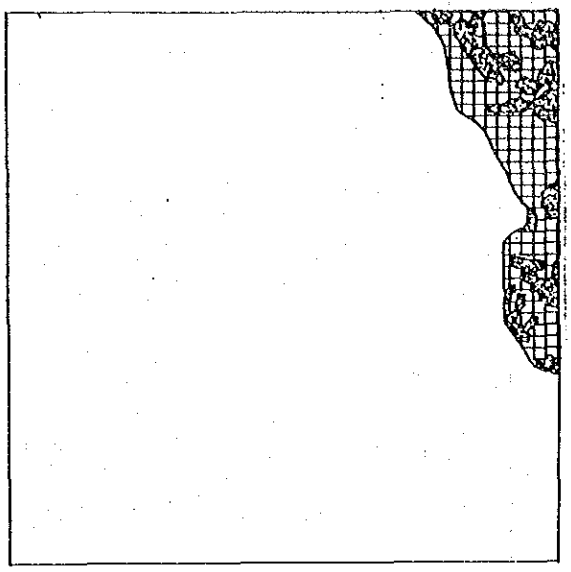
The area of landuse(Vegetation)		(Km^2)
	Forest	0.4
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	12.8
9	Fallow paddy field	-
10	Field	0.7
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season			In rainy season		

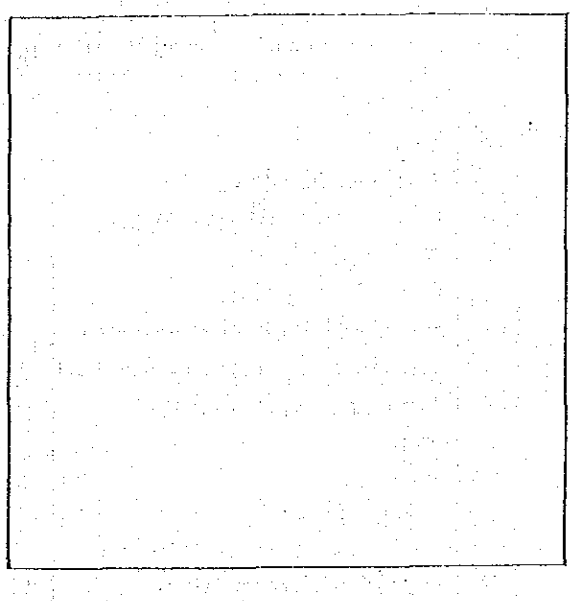
Sheet No. IX-3



(Landform)



(Landuse.Vegetation)

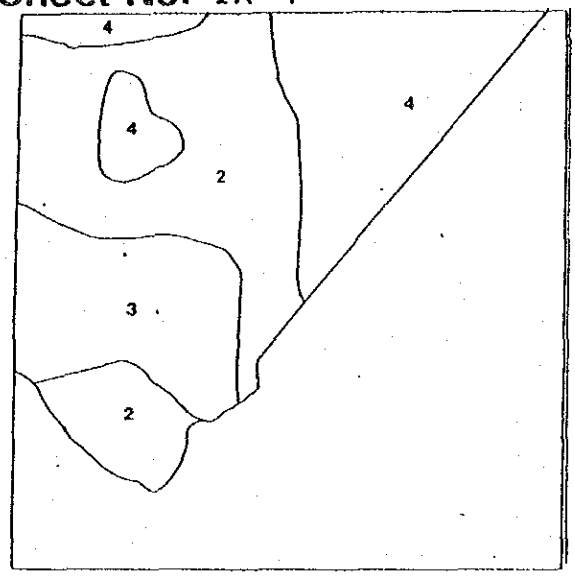


(Water covered area)

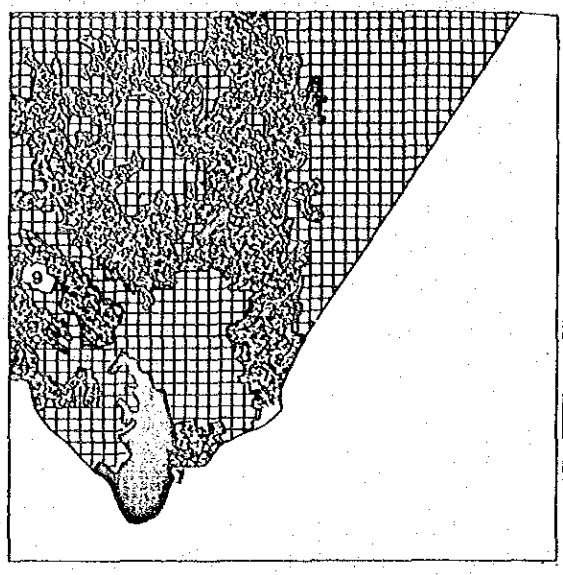
The area of landuse(Vegetation)		(Km²)
	Forest	0.8
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	1.9
9	Fallow paddy field	0.1
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	-

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season				In rainy season	

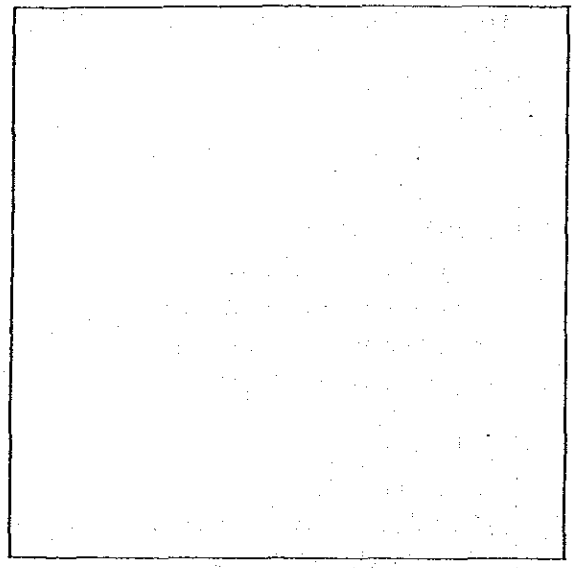
Sheet No. IX-4



(Landform)



(Landuse.Vegetation)



(Water covered area)

The area of landuse(Vegetation)		(Km²)
	Forest	6.5
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	9.8
9	Fallow paddy field	0.2
10	Field	0.2
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	2.6

Landform	1	Hill	3	Upper delta	5	Swamp	
	2	Natural levee	4	Lower delta			
Land use Vegetation		Forest	6	Floating grass	11	Pasture	
	2	Shrub		Paddy field in dry season	12	Burnt field	
	3	Tall humidiherbosa		Paddy field in rainy season	13	Water covered area	
	4	Short humidiherbosa	9	Fallow paddy field		Residential area	
	5	Dry meadow	10	Field			
Water covered area		In dry season		In rainy season			

16. References

16-1 Materials

[1] Dinas Pekerjaan Umum, Kalimantan Selatan:
Data Curah Hujan, 1975 - 1984

16-2 Bibliography

[1] OTCA: Report on Topographic Mapping Project of the Barito River Basin, Republic of Indonesia. March, 1974.

[2] OTCA: Manual of Photogrammetry with Particular Reference to the Barito River Basin Development in Kalimantan, Republic of Indonesia. March, 1974.

[3] Mosaic Photomap Project Team of the Downstream Area of the Negara River Basin in South Kalimantan: Checking and Adjustment of Elevation of the Existing Bench Marks in and around 1:10,000 Scale Photomap Making Area Based on the Available Existing Data. 25th Aug., 1984.

[4] Mosaic Photomap Project Team of the Downstream Area of the Negara River Basin in South Kalimantan: Survey Report for Mosaic Photomap Project of the Downstream Area of the Negara River Basin in South Kalimantan in the Republic of Indonesia, 2nd Year. 1st Oct., 1984.

[5] JICA: Report on Mosaic Photomap Project of the Downstream Area of the Negara River Basin in South Kalimantan in the Republic of Indonesia. (First and Second Year's Work) Jan., 1985.

[6] Geographical Survey Institute: Specifications of the Precise Geodetic Control Survey (Draft) (in Japanese)

[7] Bertanan Pohon Buah-buahan. 1974. Penerbit Yayasan Kanisius.

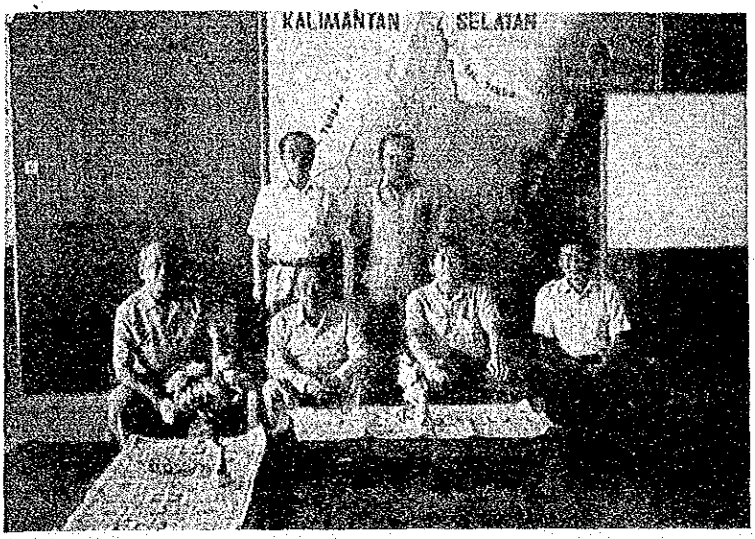
[8] Facultas Kehutanan, Universitas Lambung Mangkurat, Banjarmasin: List of Tree Species Based on Vernacular and Botanical Name in South Kalimantan. No. 8, 1983.

[9] M. Oya et al.: Manual and Application of Landform Classification. 1982, Kokin-shoin. (in Japanese)

[10] A. Watanabe: Physical Geography. 1961, Asakura-shoin. (in Japanese)

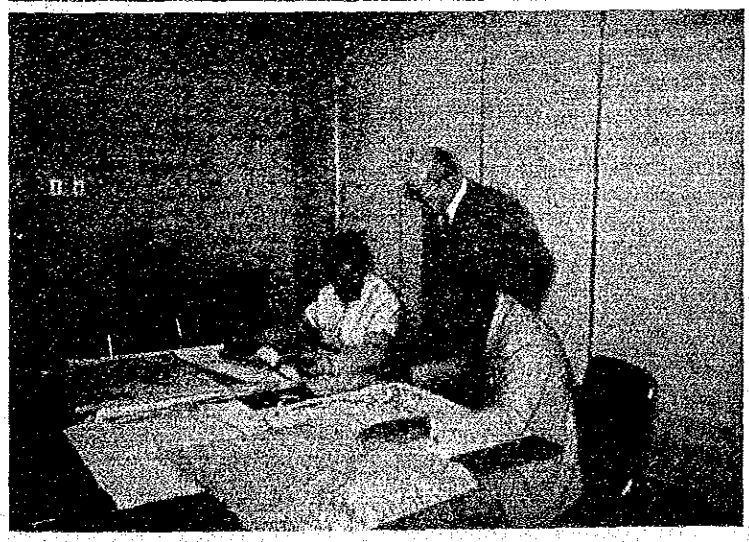
[11] JICA: Topographic Mapping Project for Upper Stream Area of Negara River Basin, South Kalimantan, Republic of Indonesia. General Report. Jan., 1986.

16 - 3 Photos



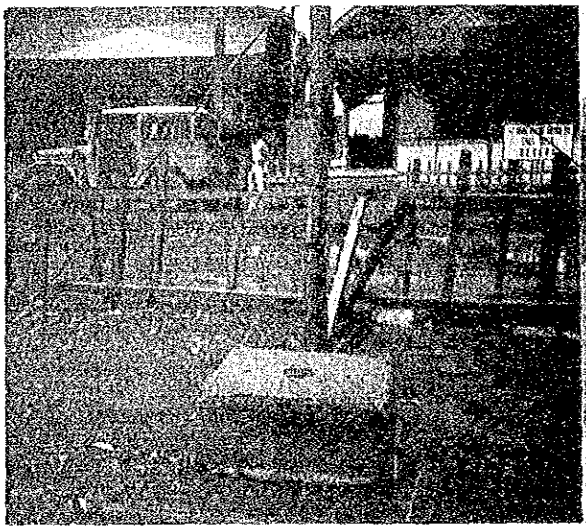
At the office of DPUKS (with representatives of DPUKS, JICA and JICA Survey Team)

Field observation of JICA advisers



Proof-reading of final drawings by Indonesian counterparts

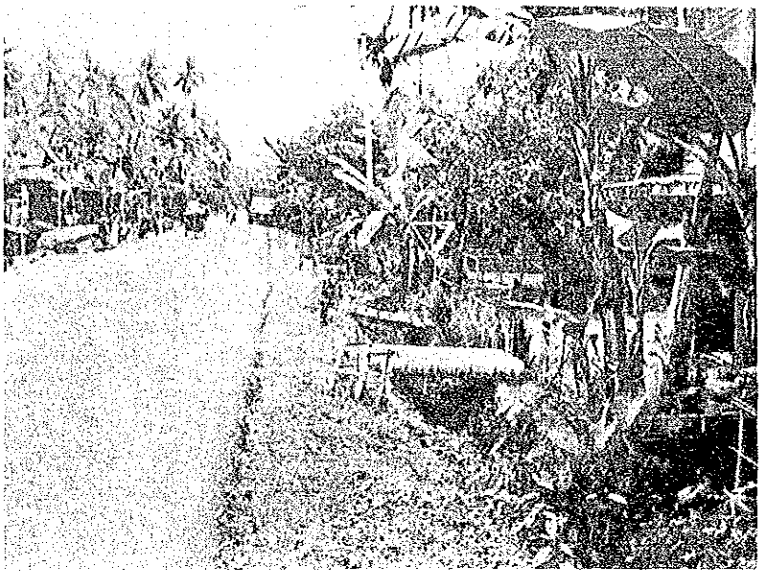
Swamp in the vicinity of Alabio



NNSS observation point
D - 642 at Negara

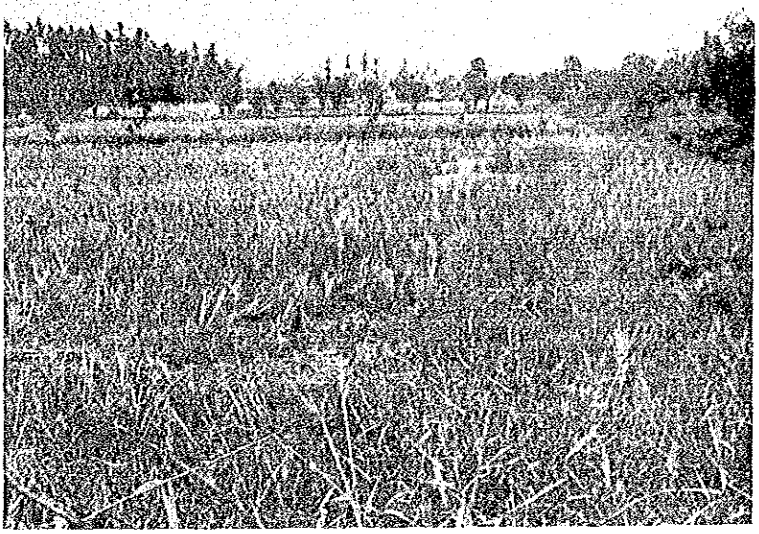
Water gauge station W-1

Flood in Barabai
Nov. 28 1984



Landscape of natural levee

In the village, banana trees are planted and palm trees are seen protruding them.

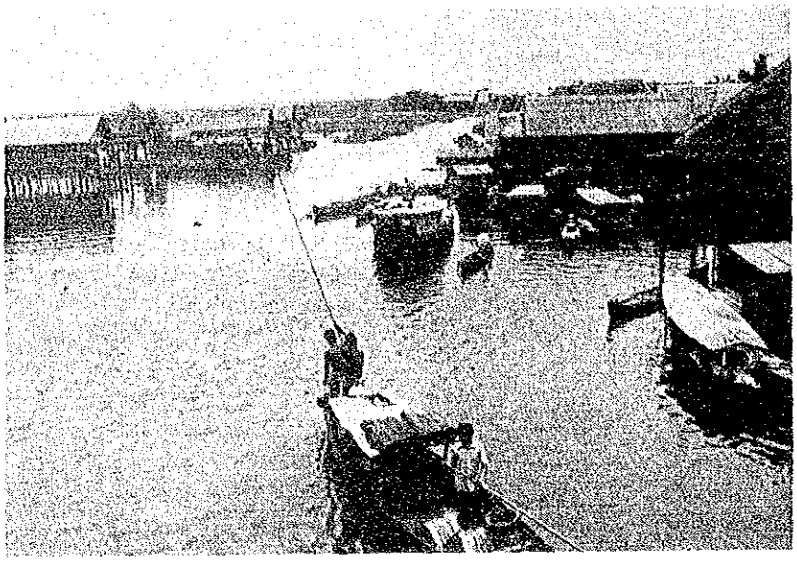


Delta in dry season

Ground height is slightly high. Paddy fields are not cultivated in dry season because of water shortage.

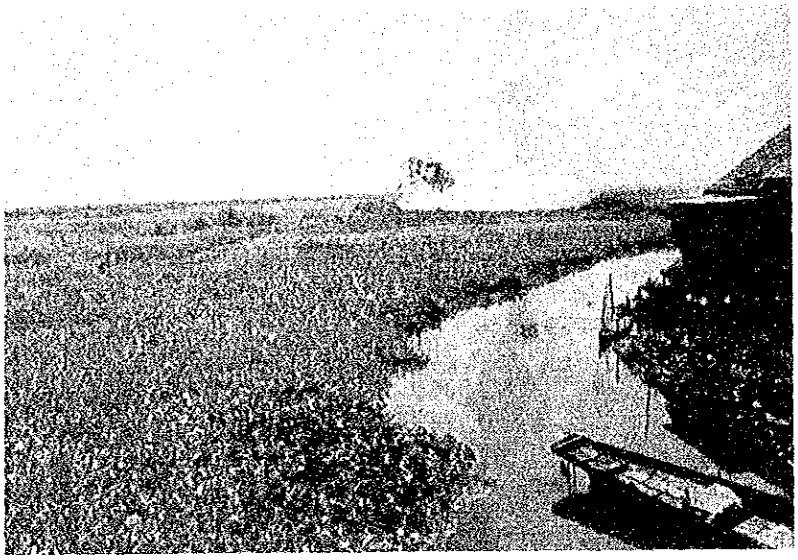
Delta in rainy season

Paddy fields are cultivated in rainy season. In this area, rice is planted in Feb.- March and cropped in May-June.



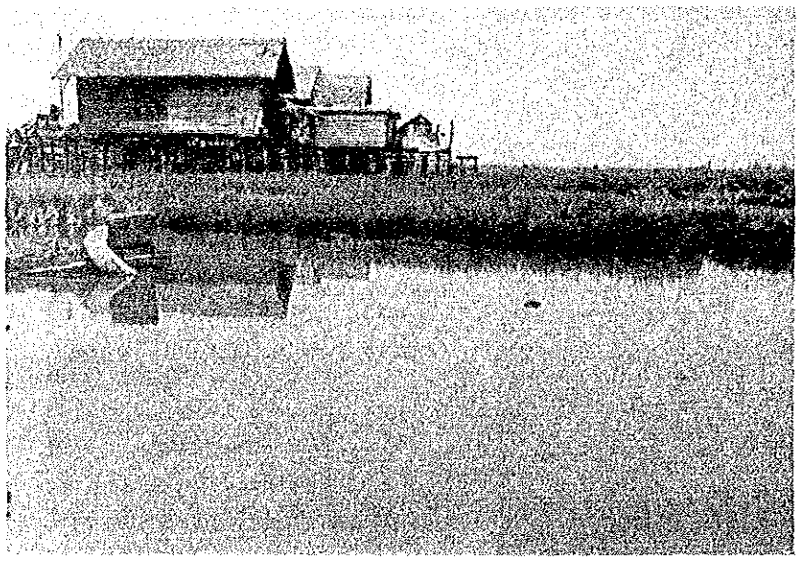
Swamp in rainy season

Water covered area expands in rainy season. Boat is transport facility in both dry and rainy seasons.



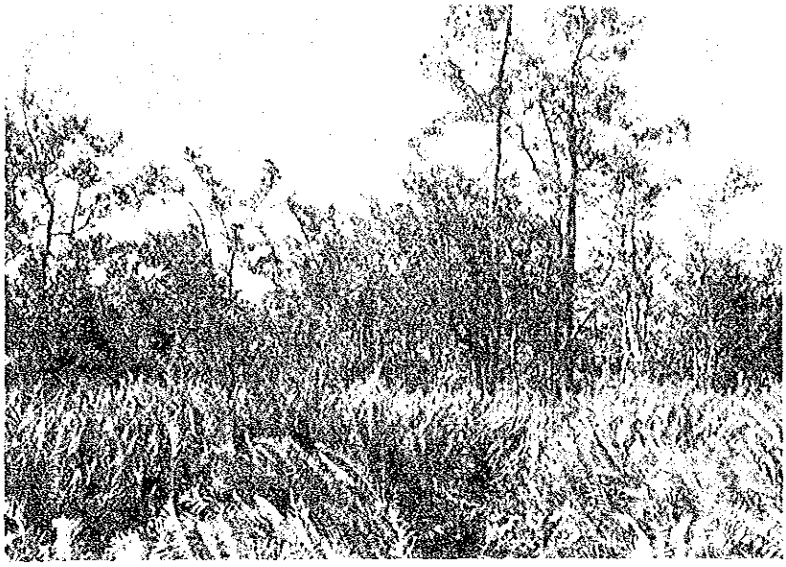
Swamp in dry season

Grass field extends mainly covered with Echinochloa crus-galli Beauv.(Ramput batu) and Phragmites crassipes (Parupuk) and dotted with burnt fields.



Swamp in rainy season

This area is covered with water in rainy season, but above water level in dry season and paddy fields are cultivated.

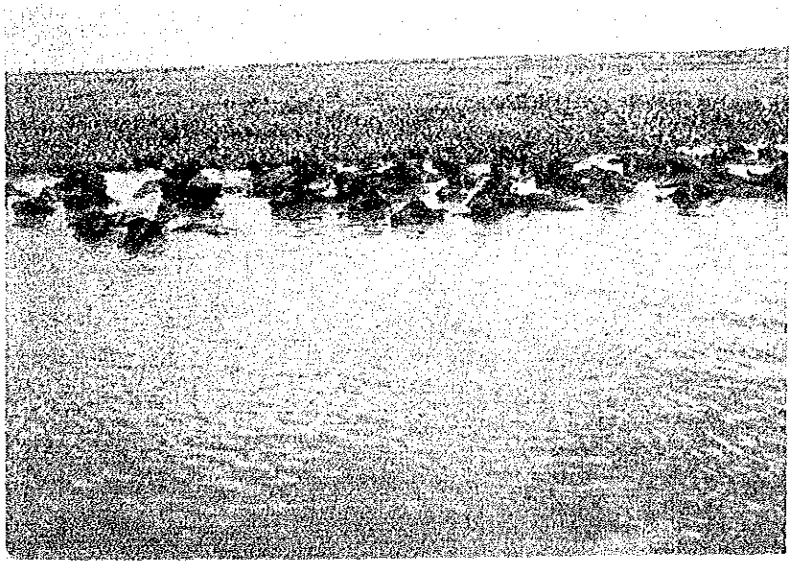


Swamp covered with forests

This area is covered with natural forests overgrown with Panchonella obovata Pierre(Kayu sepat) and 20 - 100cm higher than surrounding grass fields.

Shrub growing in swamp

This shrub, Mimosa pigra L.(Jepung), grows in the area 10 - 30 cm higher than surrounding grass fields.



Pasture spreading over swamp in dry season

Buffaloes are pastured in this area in dry season but most parts are covered with water in rainy season.