

14. 考 察

14-1 予報暦による D-642, HV-24 の座標値

GEODOP-5プログラムでは、双方の点の座標値が個々に計算されるので、その値を参考の為に記すと、予報暦による両点の座標値として次の値が得られる。

点 名	D-642			HV-24		
緯 度	2°	37′	55.521″ S	2°	20′	5.029″ S
経 度	115°	6′	36.863″ E	115°	38′	38.305″ E
楕円体上の高さ	44.1 m			65.6 m		

(1) D-642の精密暦による値と、予報暦による値との比較

与件としたD-642の精密暦による値(1982年BAKOSURTANALによる値, 4-1-3参照)と今回の予報暦による値を比較すると

(精密暦による値) - (予報暦による値) は、

緯 度 差 $0.369 (=11.07m)$

経 度 差 $-0.159 (=5.77m)$

楕円体上の高さの差 $1.1m$ となる。

(2) D-642, HV-24 におけるジオイドの高さ

両点の海面上からの高さは、直接水準測量により、タキソンにおける平均海面を基準に得られている。之と衛星測地により求められた楕円体上の高さを比較するとジオイドの高さが求められる。

	D-642	HV-24
楕円体上の高さ	44.1 m	65.6 m
平均海面上の高さ	2.0	16.8
ジオイドの高さ	42.1	48.8

(3) 調査地域近傍におけるジオイドの高さ

本調査と時期を同じくして、本調査地域の北方、タンジュンを南限とする南カリマンタン州地域に於て JICA による縮尺 1/50,000 の地形図が作成された [15, 16]。その際に行われた基準点測量では、水平位置については、本調査と同じ測地座標原点、準拠楕円体を基準とし、NNS 観測を予報暦によって処理をし、垂直位置についてはそのうちの数点を水準測量によって水準路線に取りつけている。水準測量の原点は本調査と同じく 1972 年に OTCA によって行われたタキシソンの平均海面より出発した水準路線のタンジュンにある点 PUTL-18 の値に基づいている。

従って、之らの点と、本調査で得た 2 点 D-642 (予報暦による値) 及び HV-24 の値は同じグループに属して論じ得るものと考えられる。之らの点の分布を図-14.1 に、標高値を表-14.1 に示す。

表-14.1 人工衛星観測点の標高値

点名	ID-1974 上の高さ	海面上の高さ	ジオイドの高さ
D-A602 (NS-3)	57,758 ^m	11,246 ^m	46,512 ^m
D-A603 (NS-4)	212,035	163,775	48,260
D-A604 (NS-5)	90,409	43,279	47,130
D-A605 (NS-6)	126,500	78,837	47,663
D-A606 (NS-7)	232,214	185,88	46,33
HV-24	65.6	16.8	48.8
D-642	44.1	2.0	42.1

14-2 HV-12の値について

1972年～1974年間に調査地域を含み、縮尺 $1/50,000$ 地形図が作成された。この時の標定点としては既存の三角点と、天文測量による水平基準点が用いられた。準拠楕円体としては Bessel, 投影としては U.T.M が使用されている。但し当時の測地座標系の原点の位置は遂に不明であった。

今回実施された写真図作成調査では基準点測量は1982年に BAKOSURTANAL が観測して決定した衛星測地点 D-642 を基準にして実施しており、準拠楕円体として Indonesian Datum 1974 を、投影には U. T. M が使用されている。

調査地域内に1972年に天文測量によって決定された1点 PUTAS-3 があり、之を今回測量では HV-12 として改測を行った。この2つの値を比較することにより、旧 $1/50,000$ 地形図と今回の $1/10,000$ 写真図との系統的な位置ずれの推定が行うことが出来る。両者の座標値を比較すると表-14.1 に示される如きものとなる。

表-14.1 PUTAS-3 (又は HV-12) の座標値の比較

項目	緯度	経度	N	E
1972年座標値	$2^{\circ} 47' 19.32'' S$	$115^{\circ} 15' 16.14'' E$	9,691,650 m	305,990 m
1984年座標値	$2^{\circ} 47' 22.811'' E$	$115^{\circ} 15' 48.377'' E$	9,691,511.789	306,961.301
差	-3.491	-32.237	138.211	-971.301

上記結果から、1985年に作成された縮尺 $1/10,000$ 写真図は1974年に作成された、縮尺 $1/50,000$ 地形図より南方向に約138m、東方向に約971m移動していることになる。

14-3. 間接水準測量から得られた河面の傾斜について

水位観測による間接水準測量に際して、調査地域内の低湿地帯に計19点の同時水面高が観測された。この結果を基にして、湿地帯を流れる河川の概略の河面勾配を求めた。(図-14.2) 河面の勾配は概ね下記の3つの地域に区分される。

- (1) 湿地帯の中央を走っている道路を狭んで東側の地域
河面勾配 $1/5,000 \sim 1/10,000$ 程度
- (2) 湿地帯の中央を走っている道路を狭んで西側の地域
河面勾配 $1/10,000 \sim 1/20,000$ 程度
- (3) 対象地域の南部に位置する湖及びネガラ市を含む地域
河面勾配 $1/50,000 \sim 1/100,000$ 程度

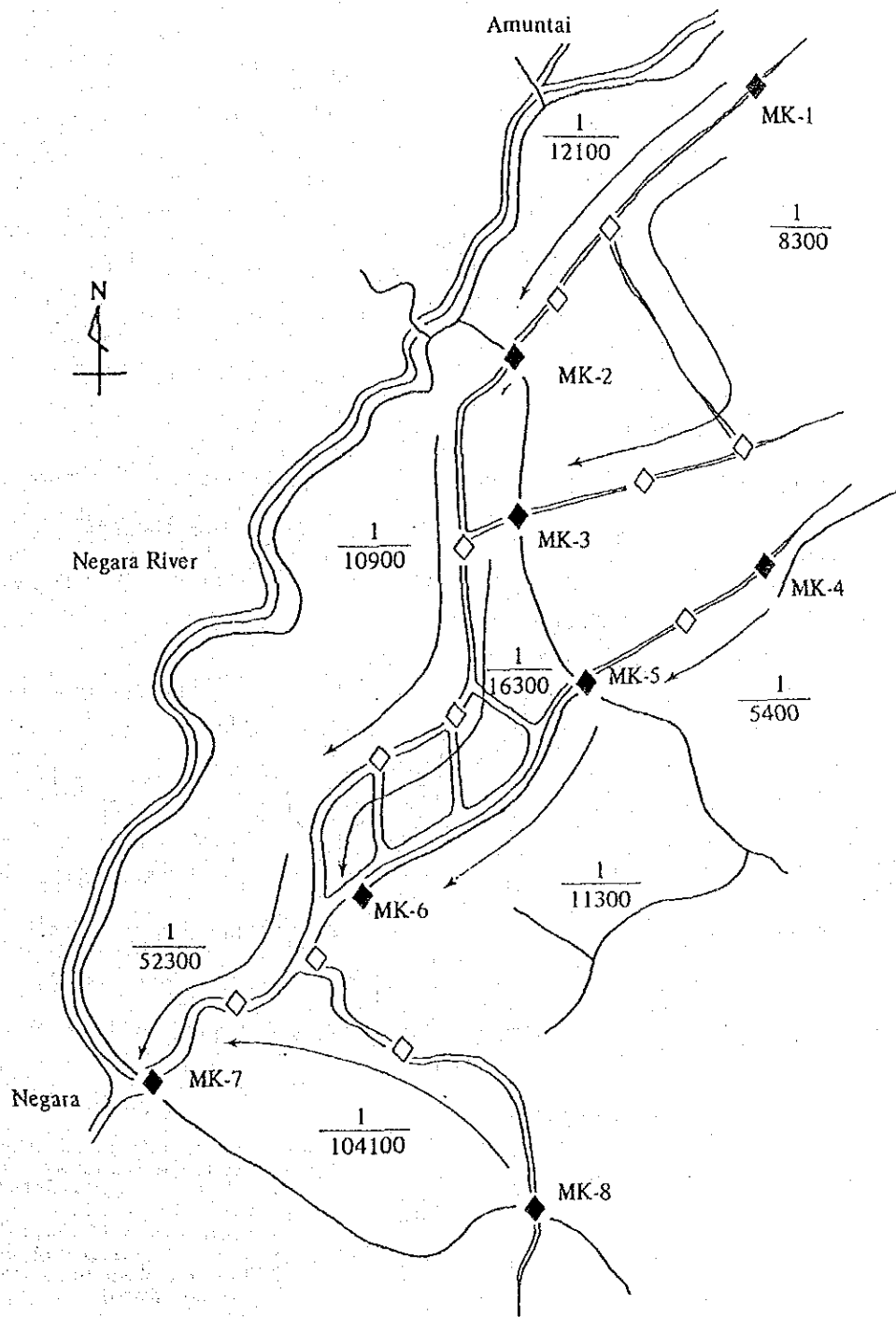


図-14.2 水位観測から求められた河面勾配

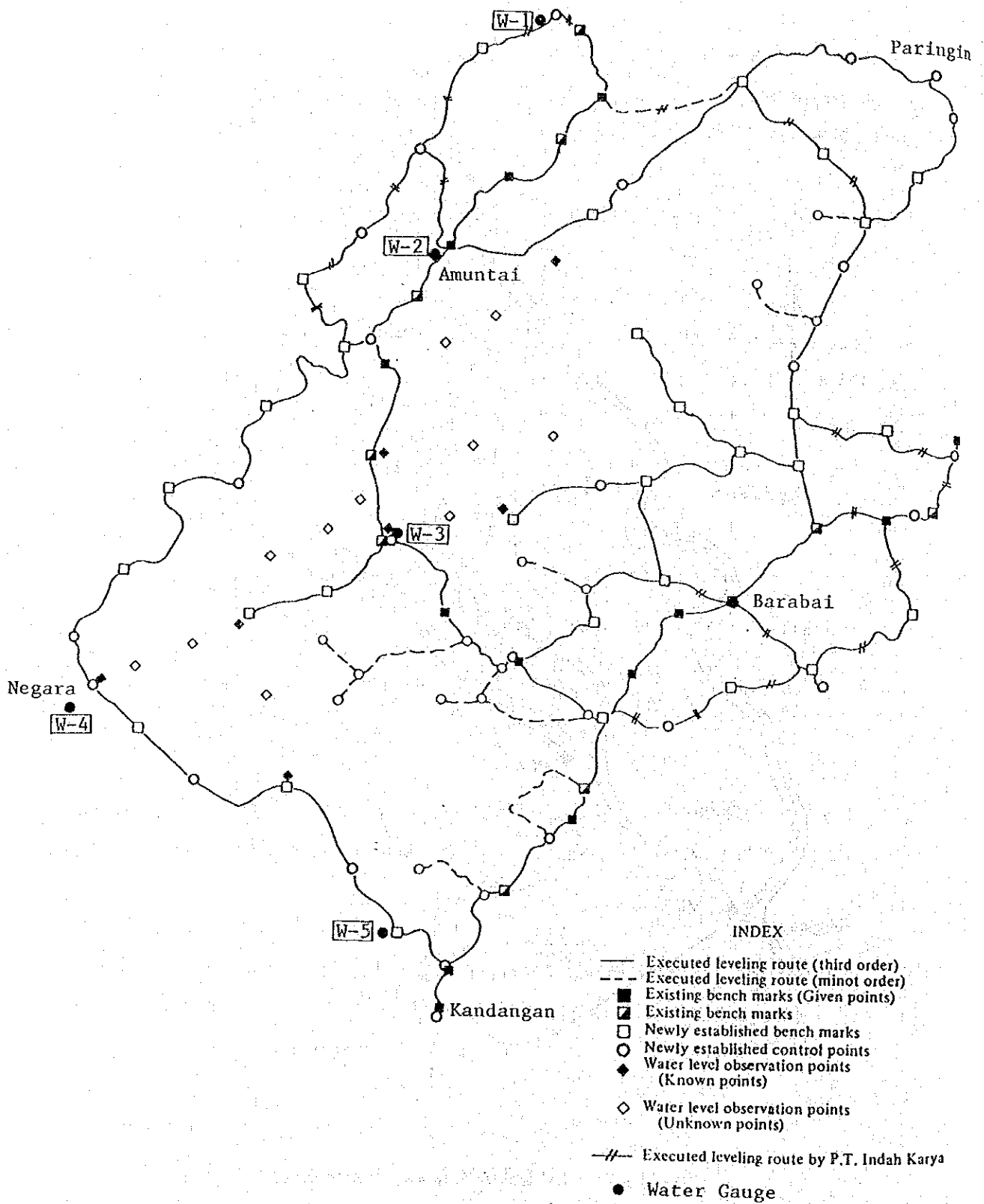


図-14.3 高さの取付けを行った自記水位観測所

14 - 4. 量水標への高さの取付けについて

調査地域内の河川には多くの水位観測所がある。観測所の中には自記水位計を備えているものもあり、そのうち今回は次の自記観測所への水準測量による高さの取付けを行った。(図-14.3)

- (1) W-1 : アムンタイからタンジュンに向う HV-1 沿いの道路が、川を渡る橋から下流約 500 m の処に在る。
- (2) W-2 : アムンタイの PUTL-15 の近くにネガラ河にかかる橋がある。その橋の下流約 150 m の処に在る。
- (3) W-3 : スンガイブルー (HV-22 の近く) の橋から上流約 50 m の処に在る。
- (4) W-4 : スンガイブルー (川名) がネガラ河と合流する地点より約 1 km 下流のネガラ河沿いに在る。
- (5) W-5 : BM ■ - 1 の南約 1 km のカンダンガン方向から流れてくる川に在る。

14 - 5 各地域の概況

各図葉ごとの地形、湛水域、土地利用、植生の概況を図-14.3 に示す。

15. 結 び

今回の写真図作成調査は、1/10,000 写真図を作成することと、地形分類図及び植生・土地利用図を作成し、これを写真図をベースとすること、並びに之らを同一の図面上に表現するという初めての試みをも行った。思考錯誤を繰返しながらか作成したが、果して利用者にとって使い易いものが作られたかどうか危惧するところである。大方の御批判を戴き、より良いものが作成されるようになることを望みたい。

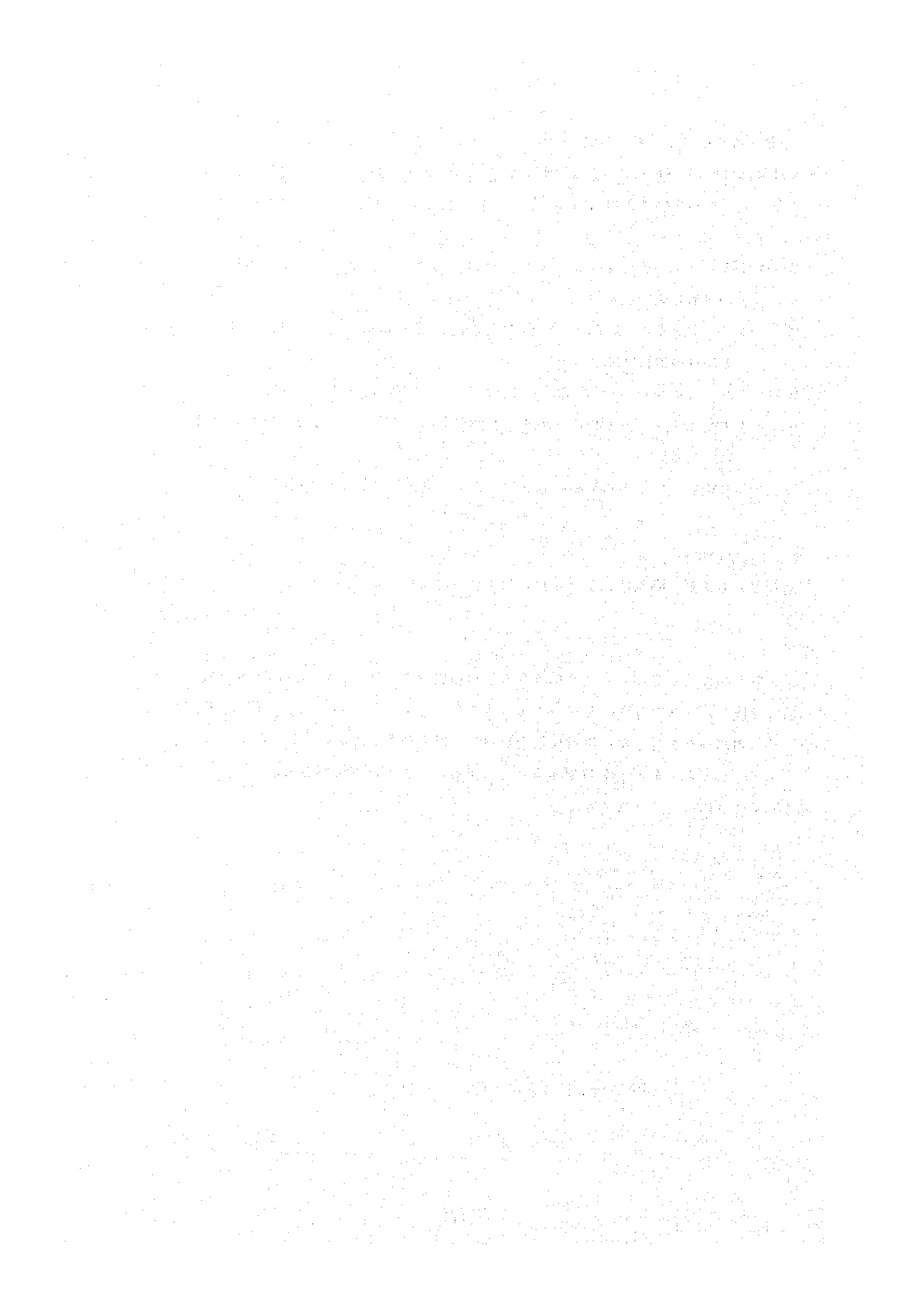
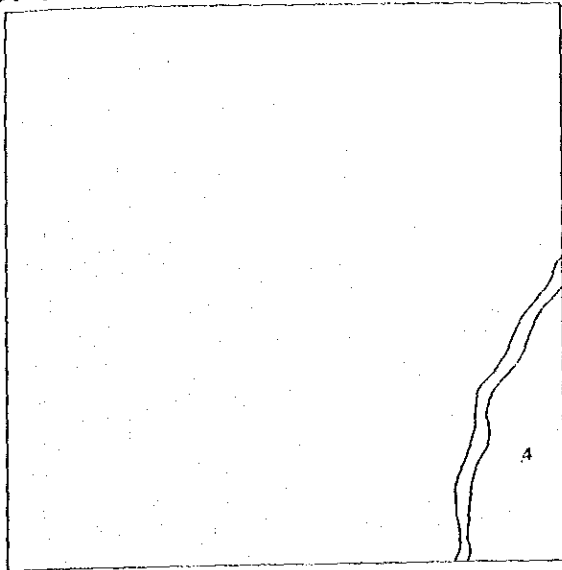
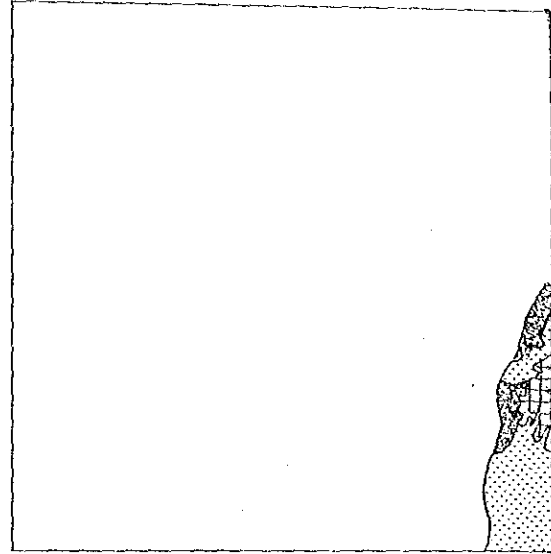


図 14.3-1 図葉別地域概観図

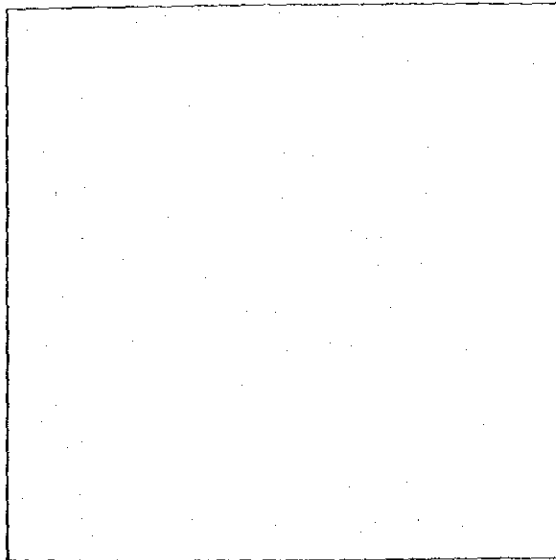
Sheet No. I-3



(Landform)



(Landuse .Vegetation)

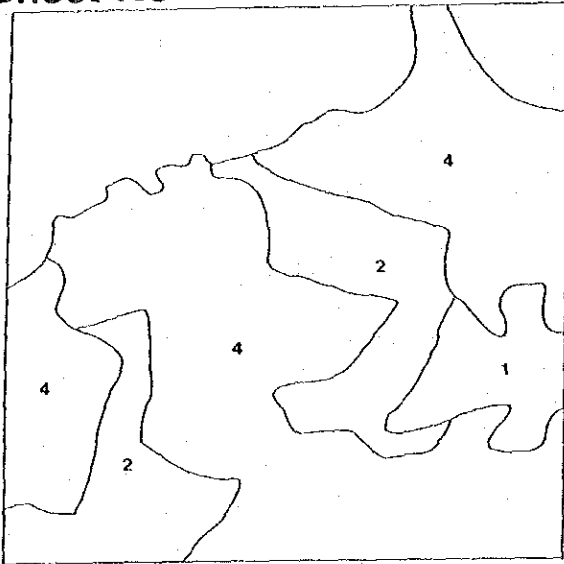


(Water covered area)

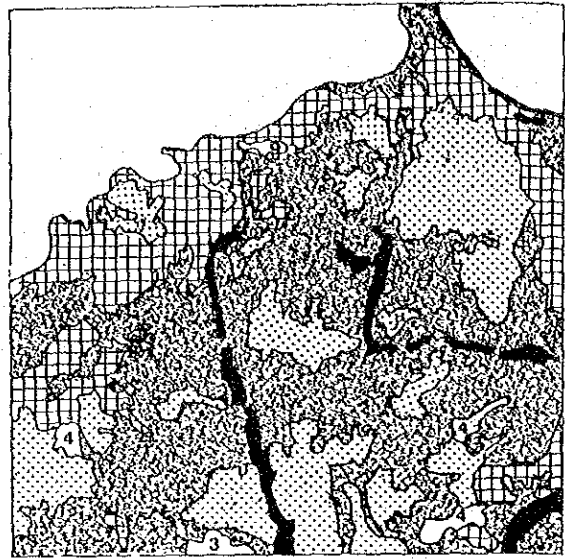
The area of landuse (Vegetation) (Km ²)		
	Forest	0.3
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	-
5	Dry meadow	-
6	Floating grass	0.1
	Paddy field in dry season	1.1
	Paddy field in rainy season	-
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential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

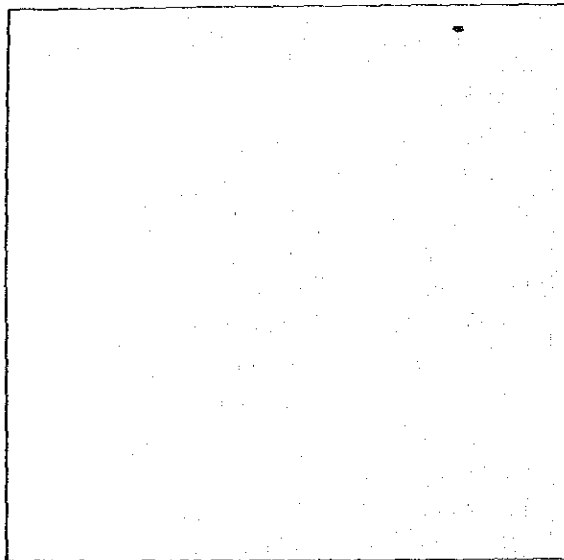
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(Landform)



(Landuse .Vegetation)

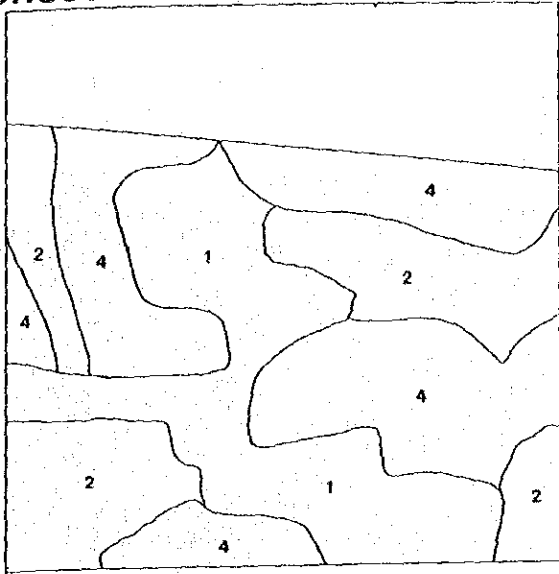


(Water covered area)

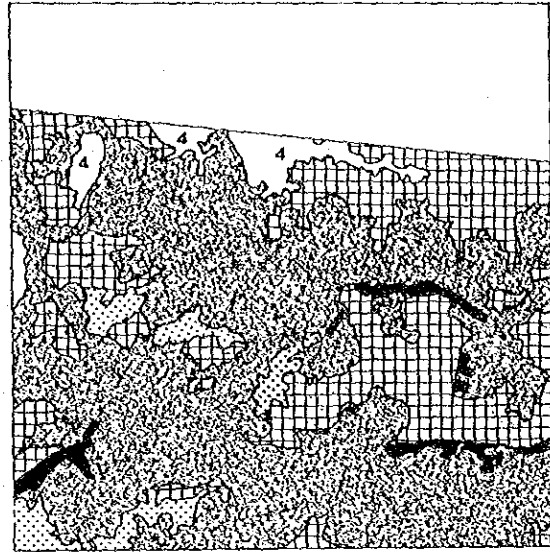
The area of landuse(Vegetation)(Km ²)	
	Forest 14.1
2	Shrub -
3	Tall humidiherbosa 0.4
4	Short humidiherbosa 0.3
5	Dry meadow 0.3
6	Floating grass 0.2
	Paddy field in dry season 9.0
	Paddy field in rainy season 4.1
9	Fallow paddy field 0.5
10	Field 0.1
11	Pasture -
12	Burnt field -
13	Water covered area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

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

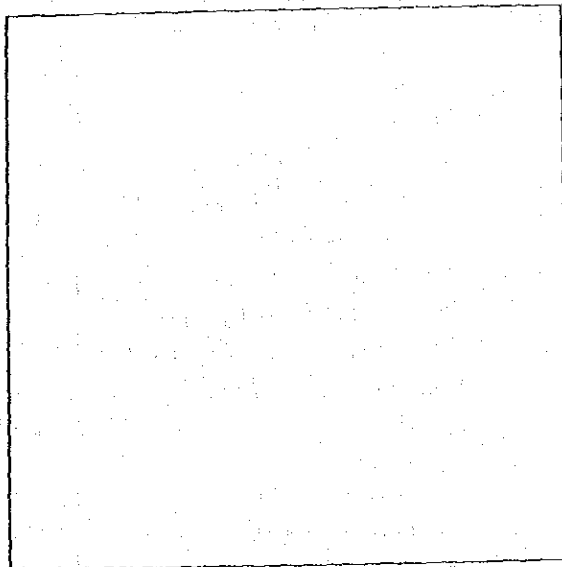
Sheet No. I-5



(Landform)



(Landuse . Vegetation)

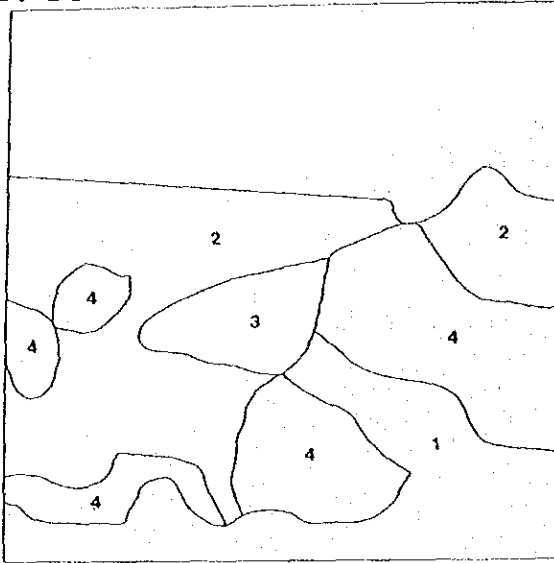


(Water covered area)

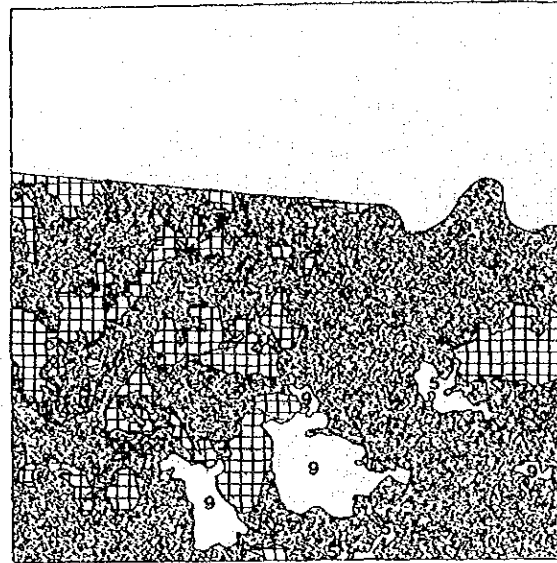
The area of landuse (Vegetation) (Km ²)		
	Forest	15.3
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	1.9
5	Dry meadow	0.5
6	Floating grass	0.2
	Paddy field in dry season	2.2
	Paddy field in rainy season	5.6
9	Fallow paddy field	0.4
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area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

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

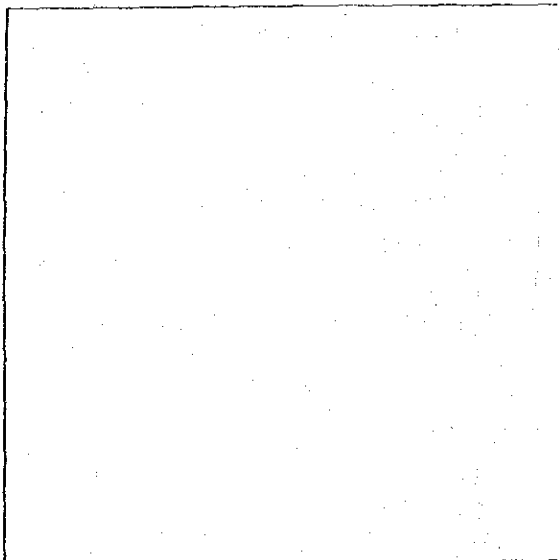
Sheet No. I-6



(Landform)



(Landuse .Vegetation)

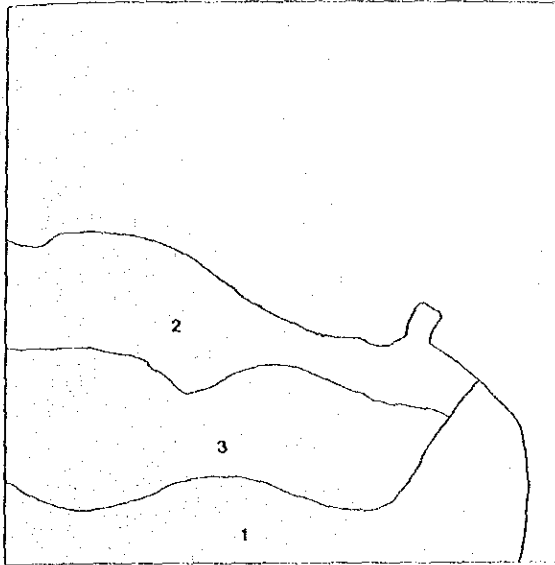


(Water covered area)

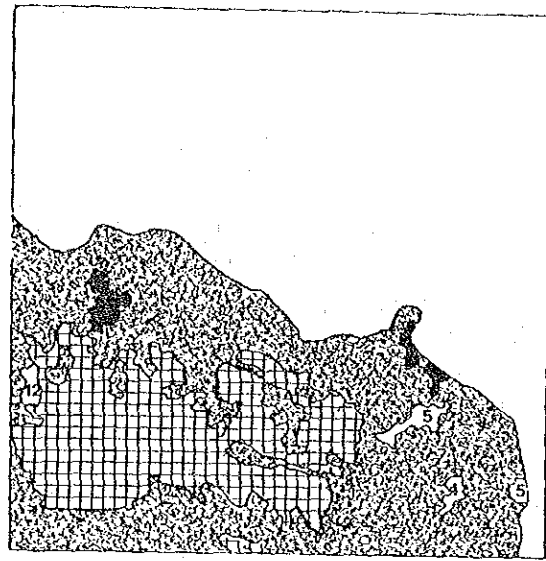
The area of landuse(Vegetation) (km ²)		
	Forest	14.6
2	Shrub	-
3	Tall humldiherbosa	-
4	Short humldiherbosa	0.3
5	Dry meadow	0.4
6	Floating grass	-
	Paddy field in dry season	0.2
	Paddy field in rainy season	5.6
9	Fallow paddy field	1.4
10	Field	0.1
11	Pasture	-
12	Burnt field	0.1
13	Water covered area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

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

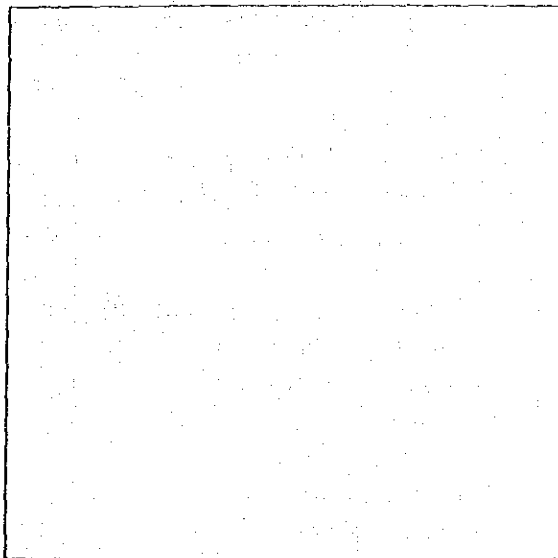
Sheet No. I-7



(Landform)



(Landuse .Vegetation)

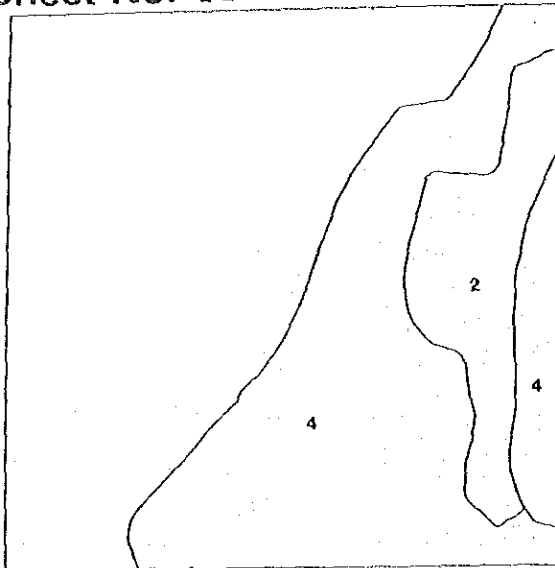


(Water covered area)

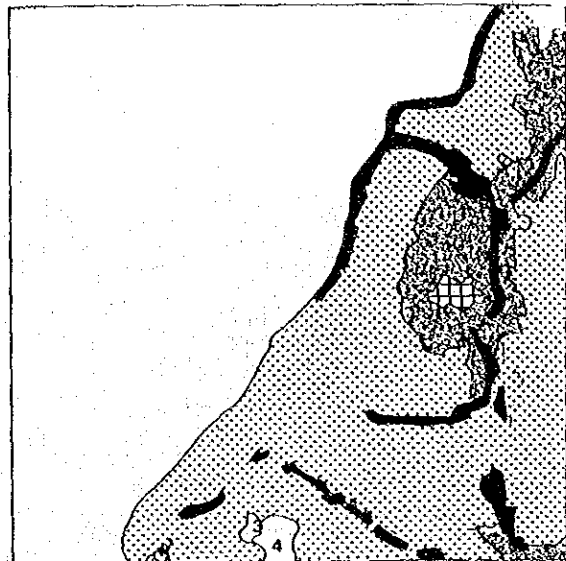
The area of landuse(Vegetation)(K ^m ²)		
	Forest	9.8
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	0.2
5	Dry meadow	0.8
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	4.8
9	Fallow paddy field	0.2
10	Field	0.4
11	Pasture	-
12	Burnt field	0.3
13	Water covered area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

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

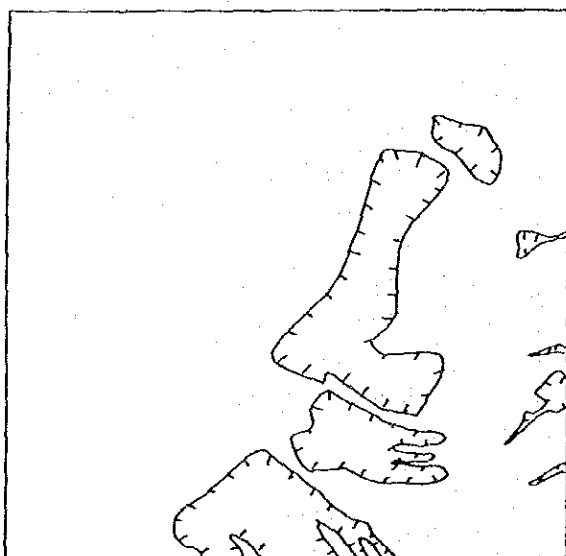
Sheet No. II-3



(Landform)



(Landuse .Vegetation)

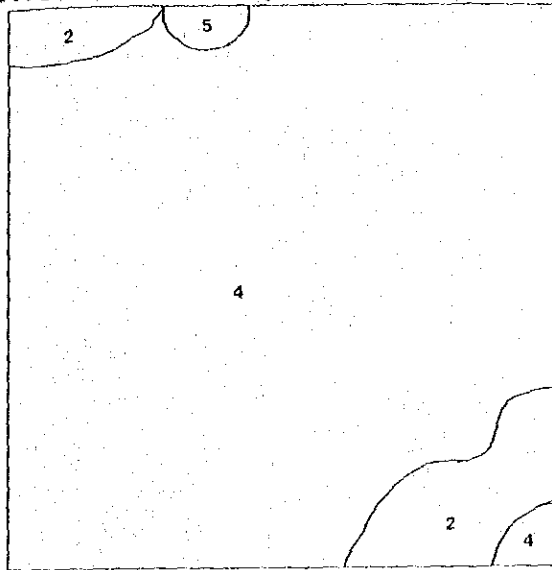


(Water covered area)

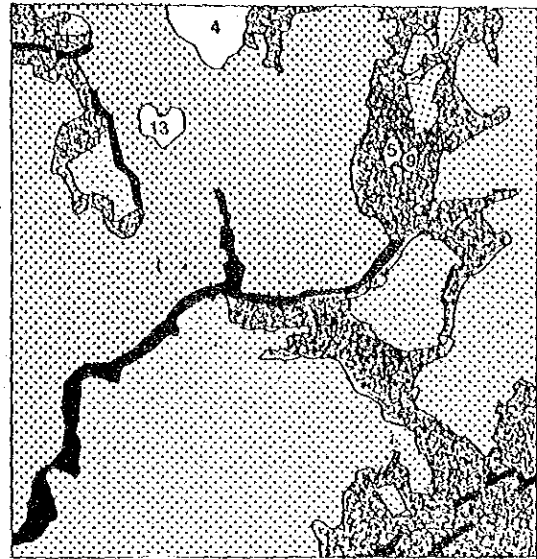
The area of landuse (Vegetation) (Km ²)	
	Forest 3.9
2	Shrub -
3	Tall humidiherbosa -
4	Short humidiherbosa 0.1
5	Dry meadow 0.1
6	Floating grass -
	Paddy field in dry season 9.9
	Paddy field in rainy season 0.3
9	Fallow paddy field 0.5
10	Field 0.3
11	Pasture -
12	Burnt field -
13	Water covered area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

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

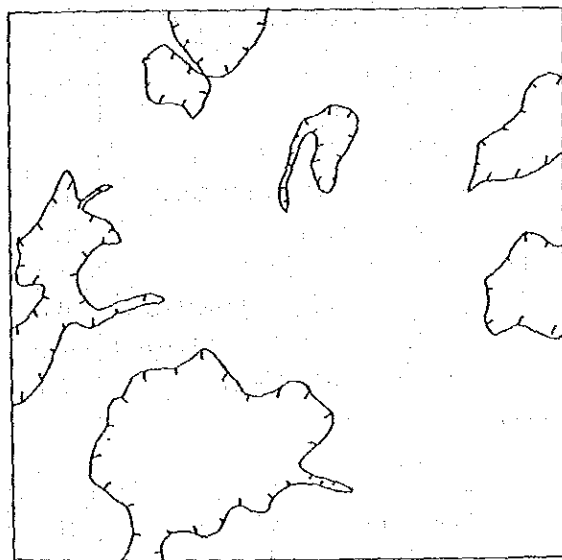
Sheet No. II-4



(Landform)



(Landuse .Vegetation)

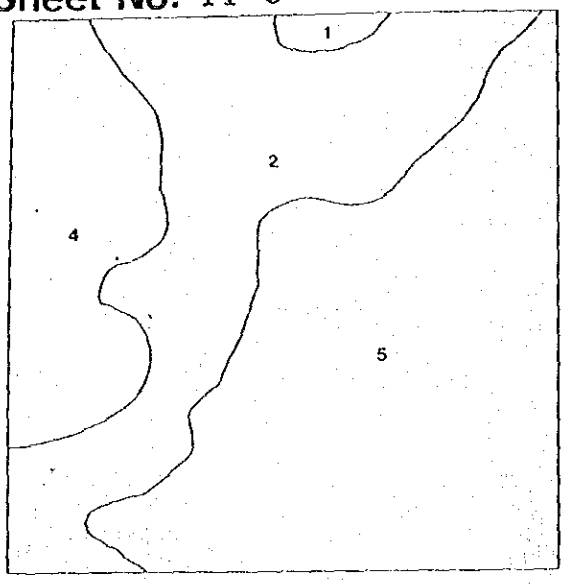


(Water covered area)

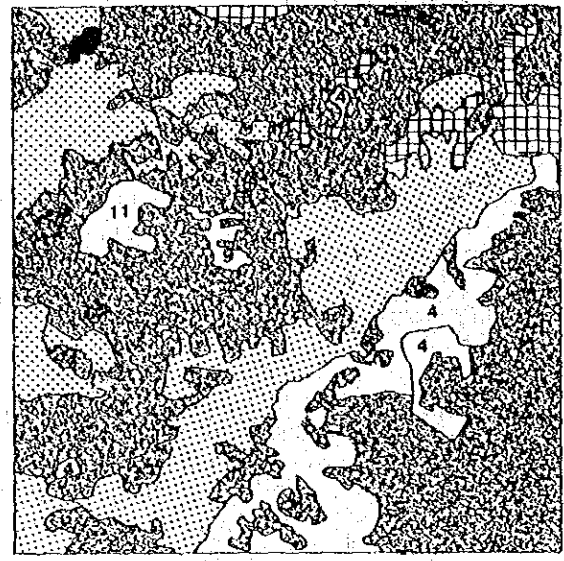
The area of landuse(Vegetation)(Km ²)	
	Forest 8.6
2	Shrub -
3	Tall humidherbosa 0.6
4	Short humidherbosa 0.1
5	Dry meadow 0.2
6	Floating grass 0.1
	Paddy field in dry season 23.1
	Paddy field in rainy season -
9	Fallow paddy field 0.5
10	Field 0.1
11	Pasture -
12	Burnt field -
13	Water covered area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

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

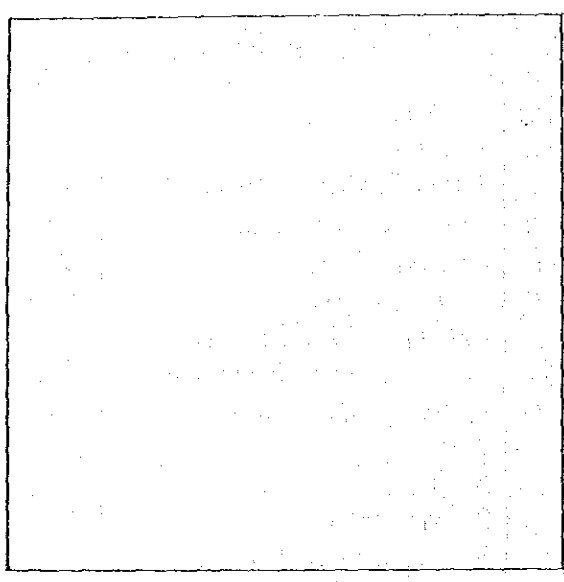
Sheet No. II-5



(Landform)



(Landuse . Vegetation)

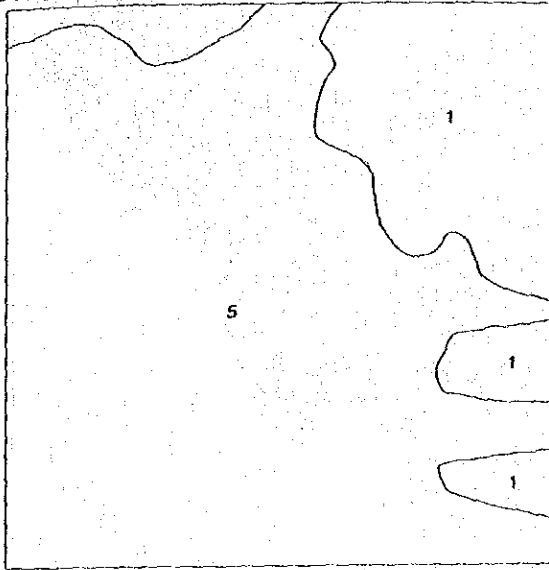


(Water covered area)

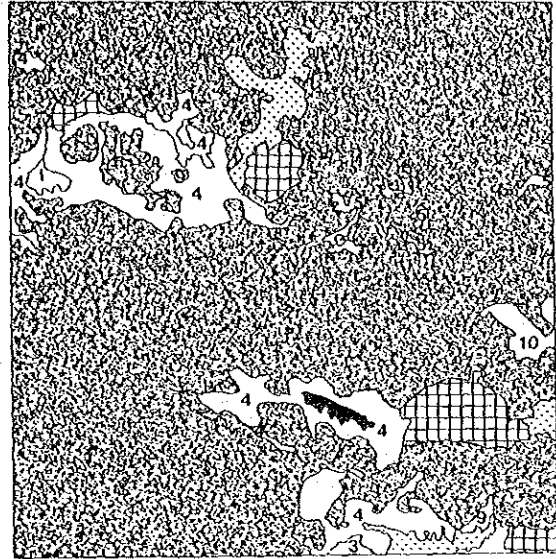
The area of landuse (Vegetation) (Km ²)		
	Forest	19.1
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	3.6
5	Dry meadow	0.2
6	Floating grass	0.1
	Paddy field in dry season	8.6
	Paddy field in rainy season	1.2
9	Fallow paddy field	2.1
10	Field	0.1
11	Pasture	-
12	Burnt field	-
13	Water covered area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

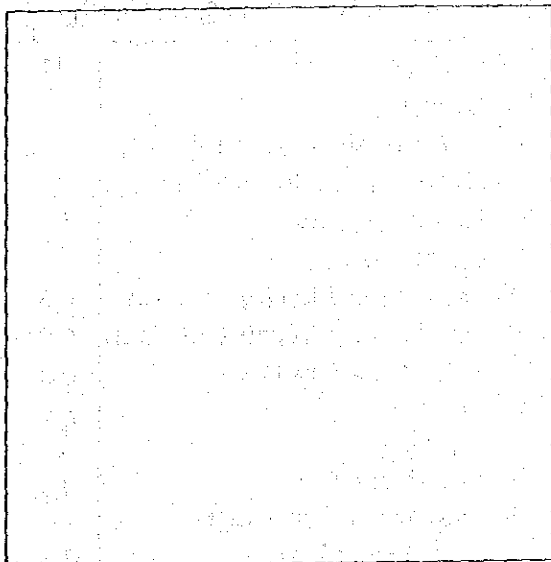
Sheet No. II-6



(Landform)



(Landuse .Vegetation)

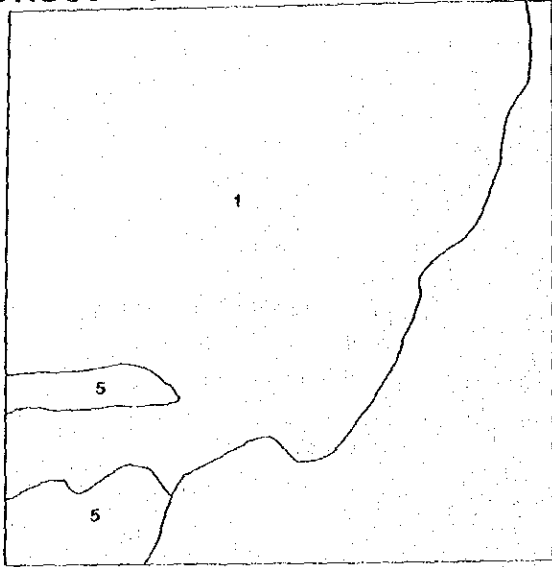


(Water covered area)

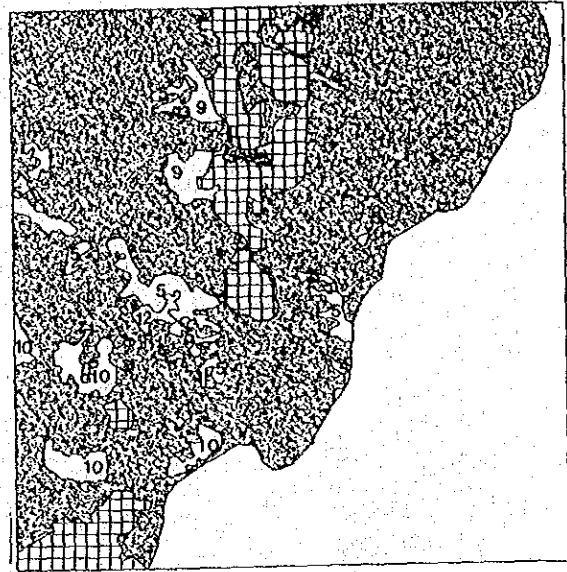
The area of landuse (Vegetation) (Kni ²)	
	Forest 28.0
2	Shrub -
3	Tall humidherbosa 0.1
4	Short humidherbosa 3.7
5	Dry meadow 0.4
6	Floating grass -
	Paddy field in dry season 1.1
	Paddy field in rainy season 1.7
9	Fallow paddy field 0.7
10	Field 0.3
11	Pasture -
12	Burnt field -
13	Water covered area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

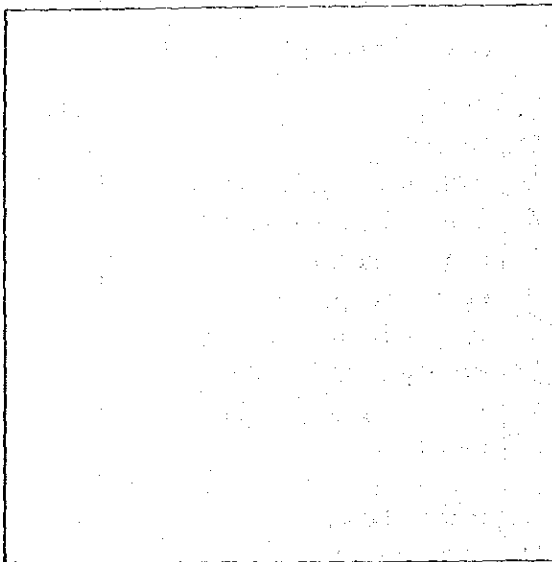
Sheet No. II-7



(Landform)



(Landuse . Vegetation)

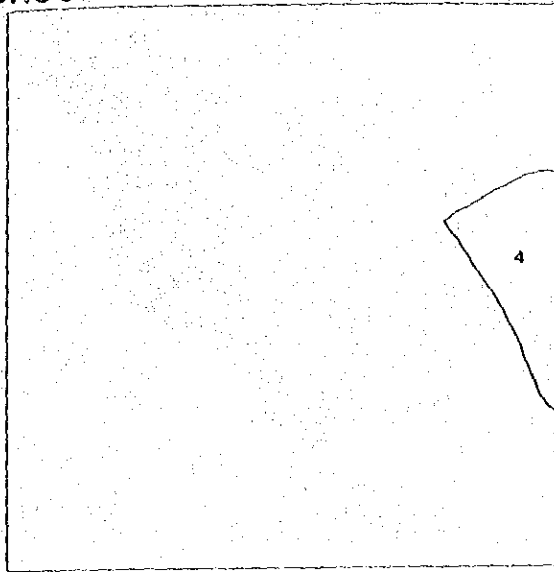


(Water covered area)

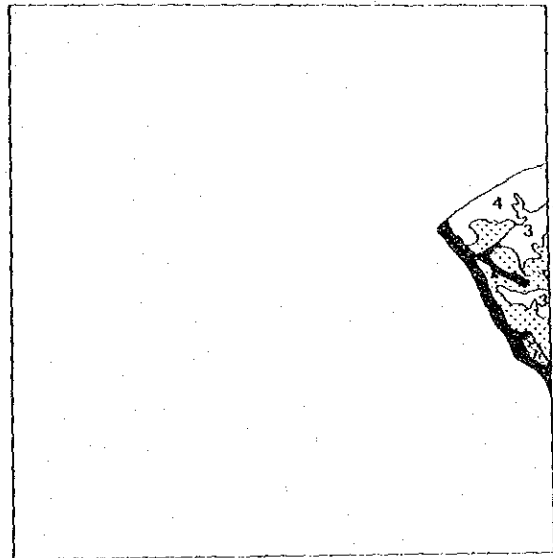
The area of landuse (Vegetation) (Kri ²)		
	Forest	17.8
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	-
5	Dry meadow	1.6
6	Floating grass	-
	Paddy field in dry season	0.3
	Paddy field in rainy season	2.6
9	Fallow paddy field	0.6
10	Field	0.9
11	Pasture	-
12	Burnt field	0.1
13	Water covered area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

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

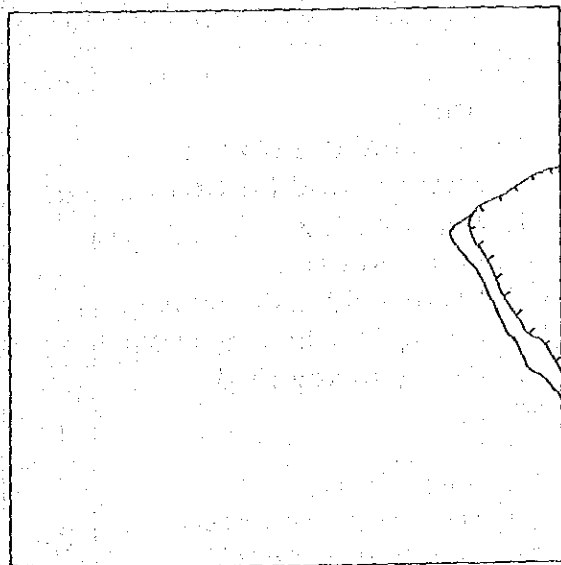
Sheet No. III-2



(Landform)



(Landuse .Vegetation)

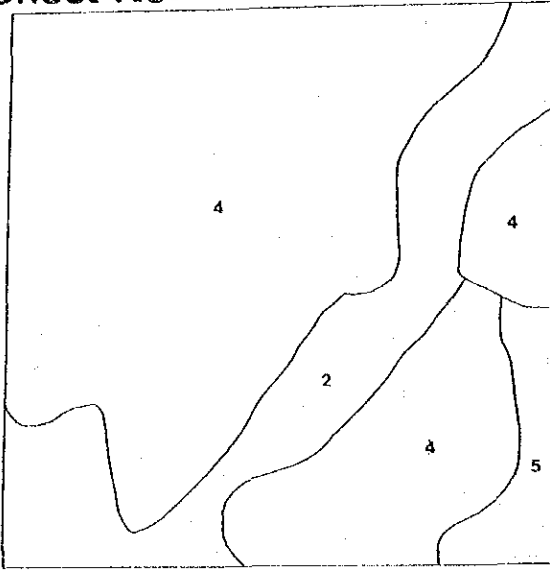


(Water covered area)

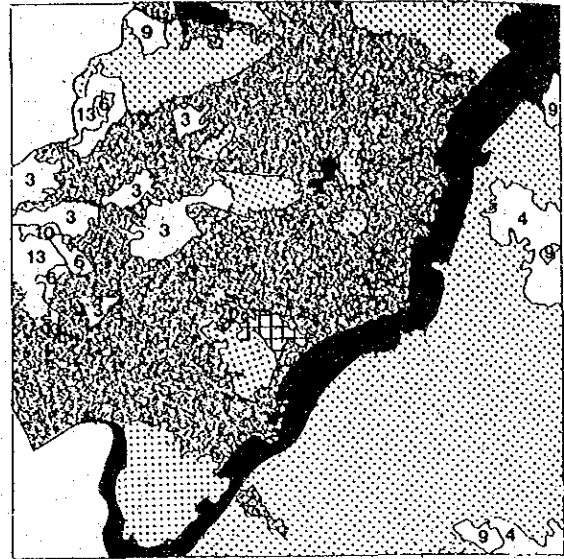
The area of landuse(Vegetation) (km ²)		
	Forest	-
2	Shrub	-
3	Tall humidiherbosa	0.4
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	1.1
	Paddy field in rainy season	-
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.1
	Residential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

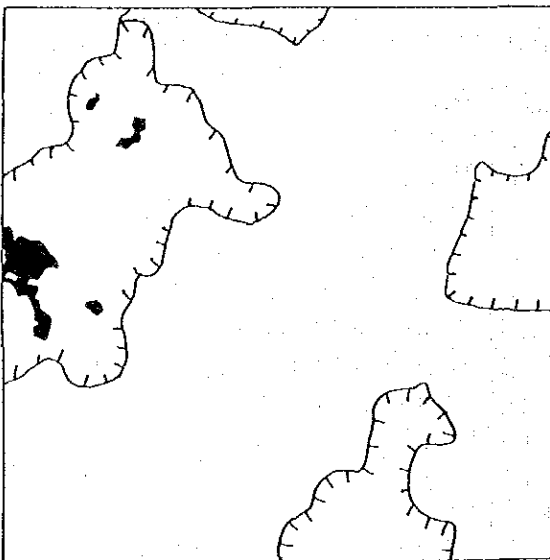
Sheet No. III-3



(Landform)



(Landuse . Vegetation)

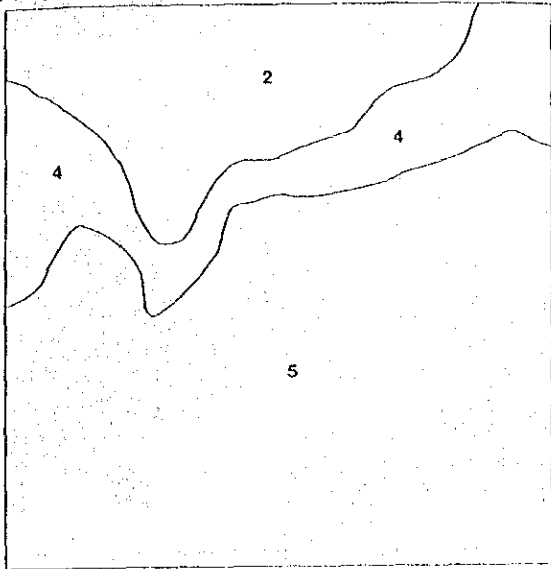


(Water covered area)

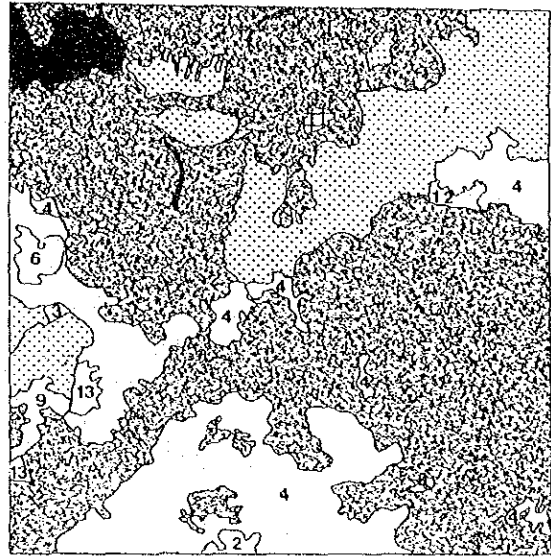
The area of landuse (Vegetation) (Km ²)	
	Forest 4.8
2	Shrub -
3	Tall humidherbosa 1.2
4	Short humidherbosa 0.7
5	Dry meadow -
6	Floating grass 0.5
	Paddy field in dry season 24.3
	Paddy field in rainy season 0.5
9	Fallow paddy field 1.1
10	Field 0.2
11	Pasture -
12	Burnt field -
13	Water covered area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

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

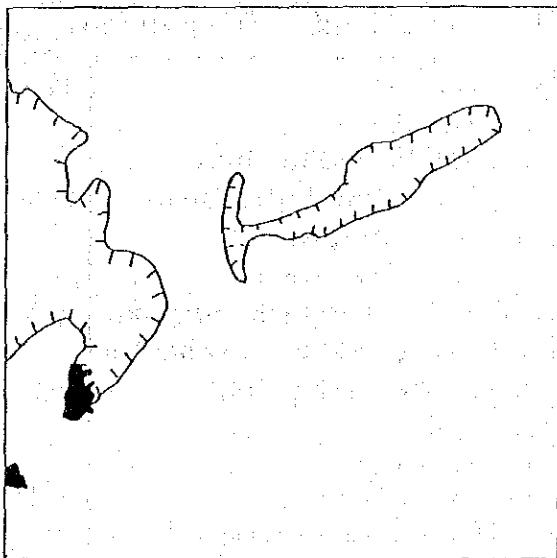
Sheet No. III-4



(Landform)



(Landuse .Vegetation)

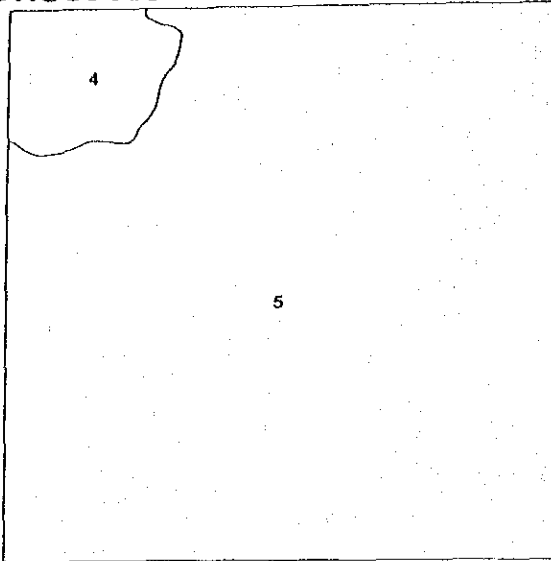


(Water covered area)

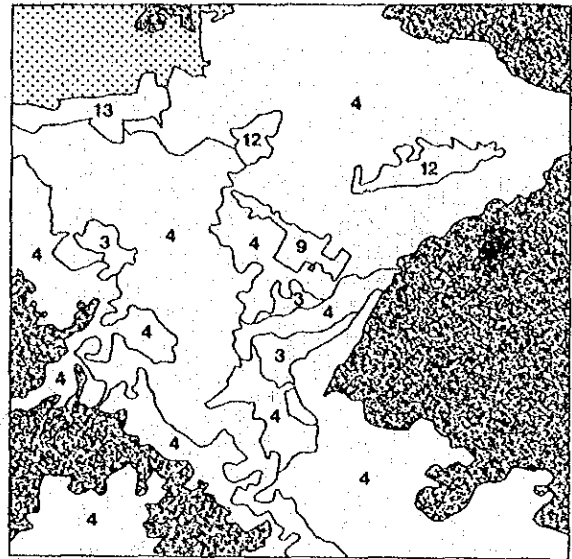
The area of landuse (Vegetation) (km ²)		(km ²)
	Forest	20.7
2	Shrub	0.1
3	Tall humidherbosa	0.6
4	Short humidherbosa	5.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	7.0
	Paddy field in rainy season	-
9	Fallow paddy field	0.9
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered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

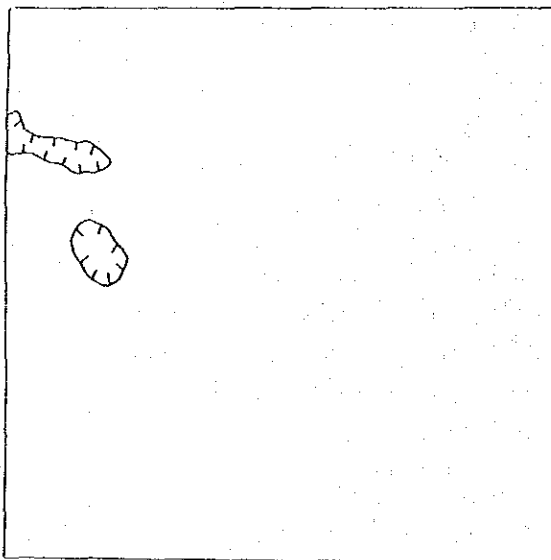
Sheet No. III-5



(Landform)



(Landuse .Vegetation)

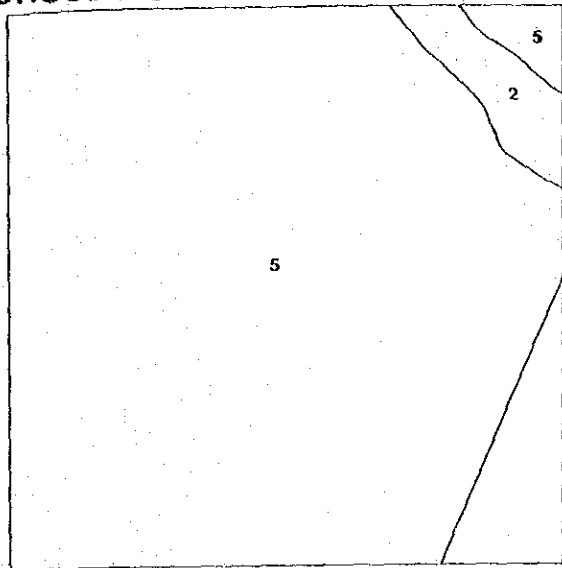


(Water covered area)

The area of landuse (Vegetation) (km ²)		
	Forest	12.5
2	Shrub	-
3	Tall humidherbosa	3.4
4	Short humidherbosa	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	2 Natural levee	3 Upper delta	4 Lower delta	5 Swamp
Land use Vegetation	Forest	2 Shrub	3 Tall humidherbosa	4 Short humidherbosa	5 Dry meadow
Water covered area		In dry season			In rainy season

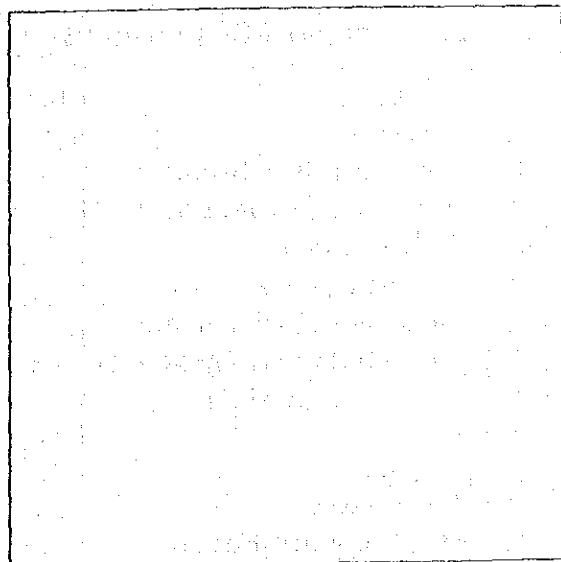
Sheet No. III-6



(Landform)



(Landuse .Vegetation)

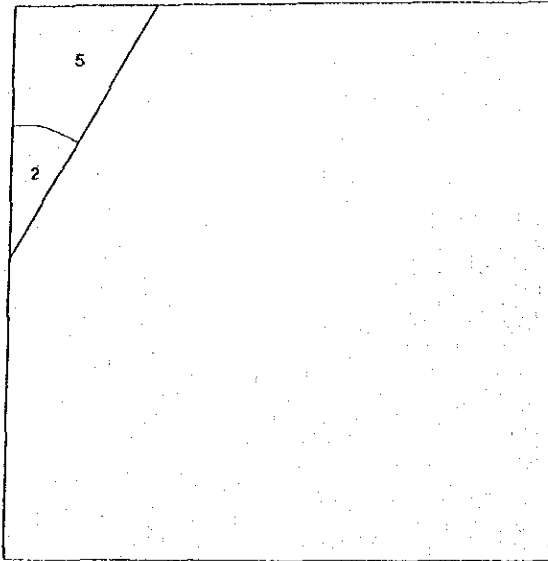


(Water covered area)

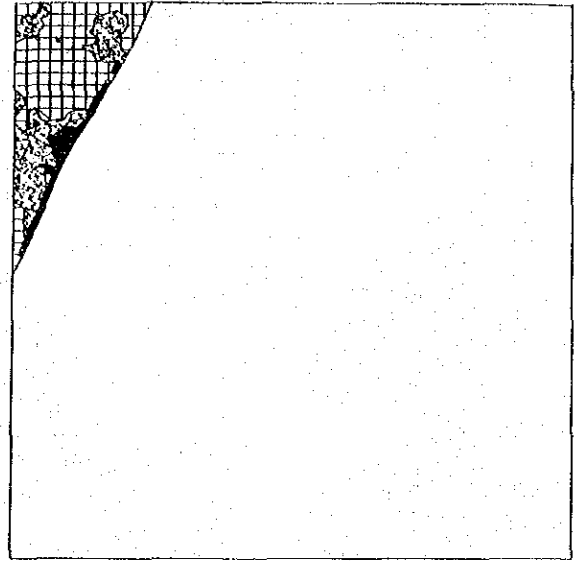
The area of landuse(Vegetation) (km ²)		
	Forest	25.4
2	Shrub	-
3	Tall humidherbosa	0.6
4	Short humidherbosa	2.8
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	4.4
9	Fallow paddy field	1.0
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential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

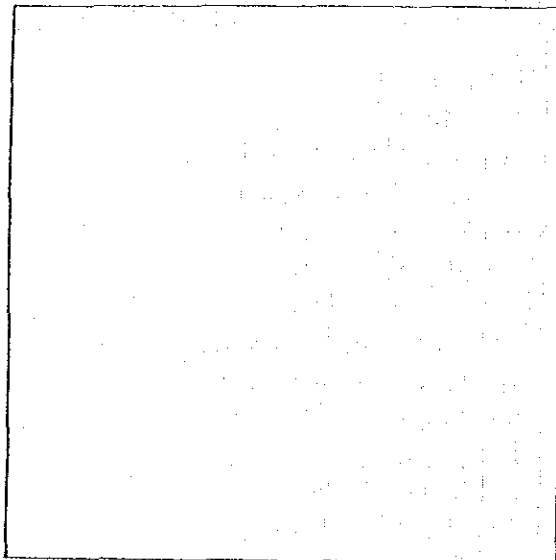
Sheet No. III-7



(Landform)



(Landuse .Vegetation)

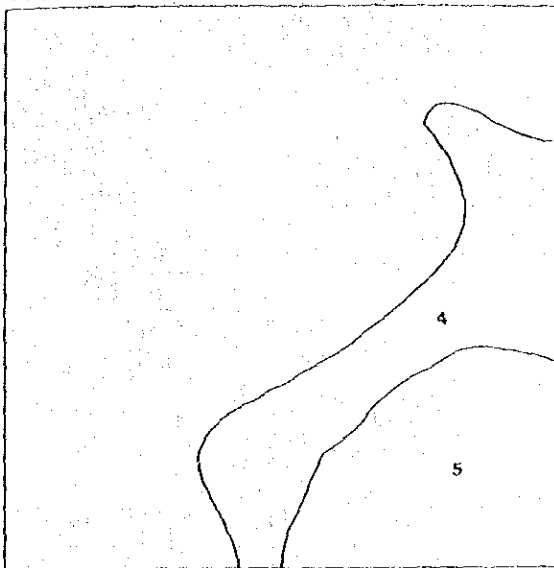


(Water covered area)

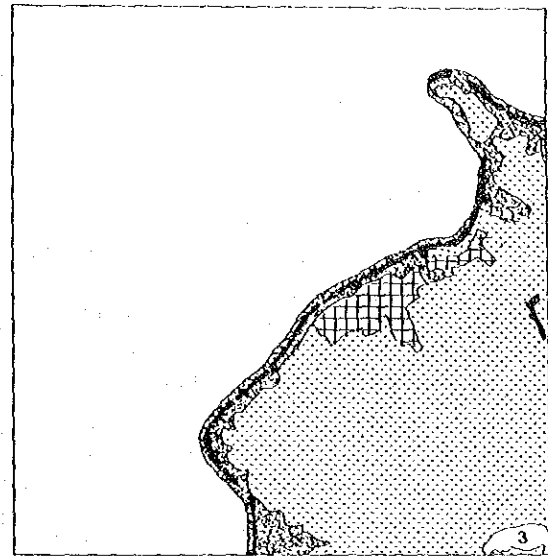
The area of landuse (Vegetation) (Km ²)		
	Forest	0.5
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	1.6
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential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

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

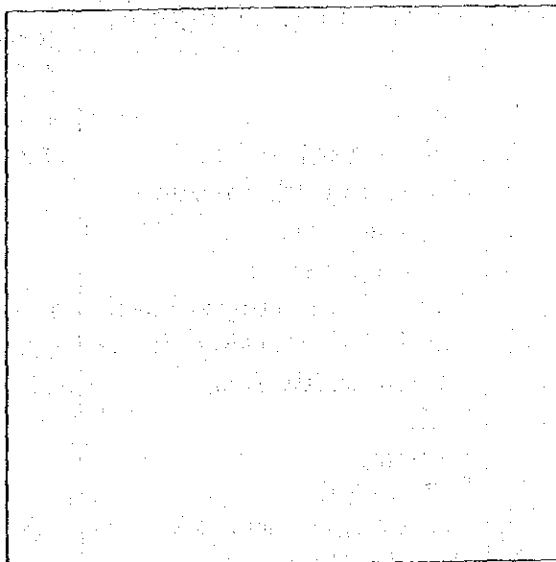
Sheet No. IV-2



(Landform)



(Landuse. Vegetation)

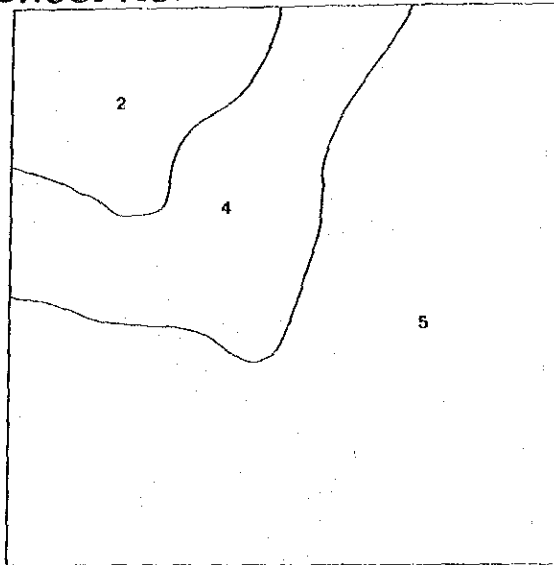


(Water covered area)

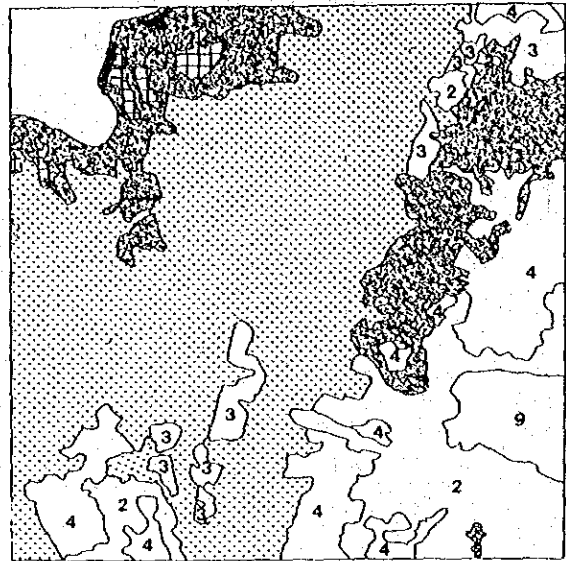
The area of landuse (Vegetation) (K ² m ²)		
	Forest	0.3
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	11.8
	Paddy field in rainy season	0.4
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.2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

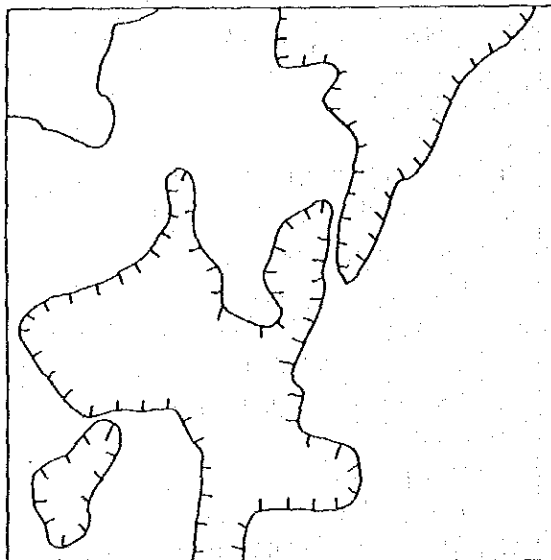
Sheet No. IV-3



(Landform)



(Landuse. Vegetation)

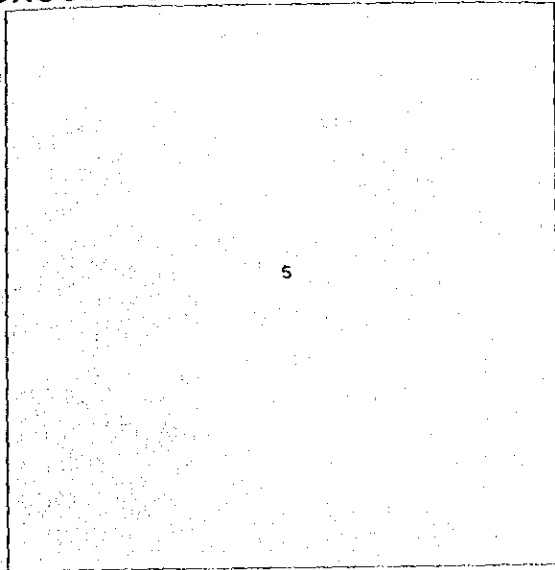


(Water covered area)

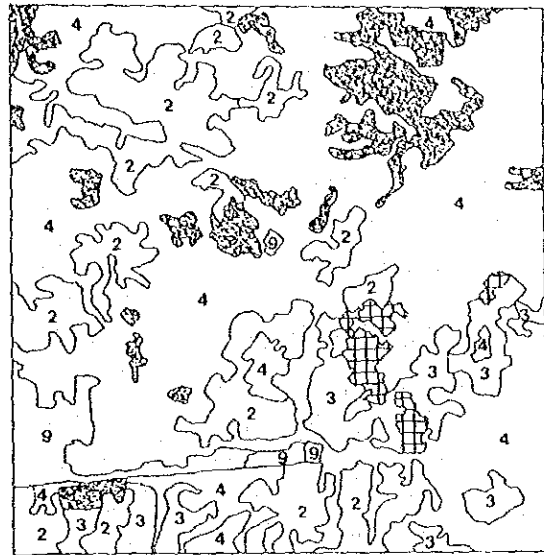
The area of landuse (Vegetation) (Km ²)	
	Forest 4.7
2	Shrub 4.5
3	Tall humidherbosa 0.2
4	Short humidherbosa 2.3
5	Dry meadow -
6	Floating grass -
	Paddy field in dry season 18.6
	Paddy field in rainy season 0.2
9	Fallow paddy field 2.7
10	Field -
11	Pasture -
12	Burnt field -
13	Water covered area 1.3
	Residential area -

Landform	1 Hill	2 Natural levee	3 Upper delta	4 Lower delta	5 Swamp
Land use Vegetation	Forest	2 Shrub	3 Tall humidherbosa	4 Short humidherbosa	5 Dry meadow
	Paddy field in dry season	Paddy field in rainy season	9 Fallow paddy field	10 Field	
Water covered area		In dry season		In rainy season	

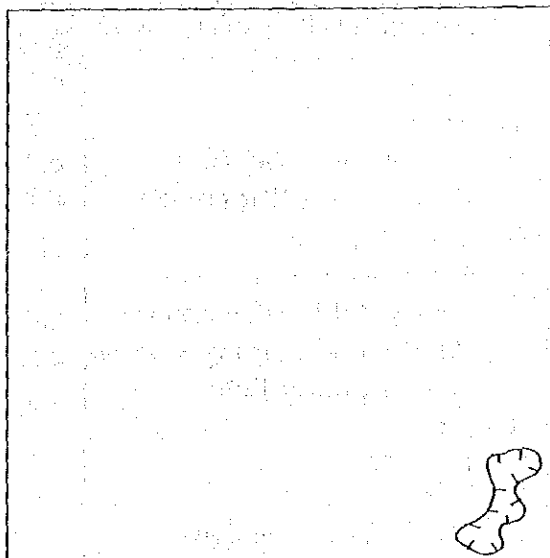
Sheet No. IV-4



(Landform)



(Landuse . Vegetation)

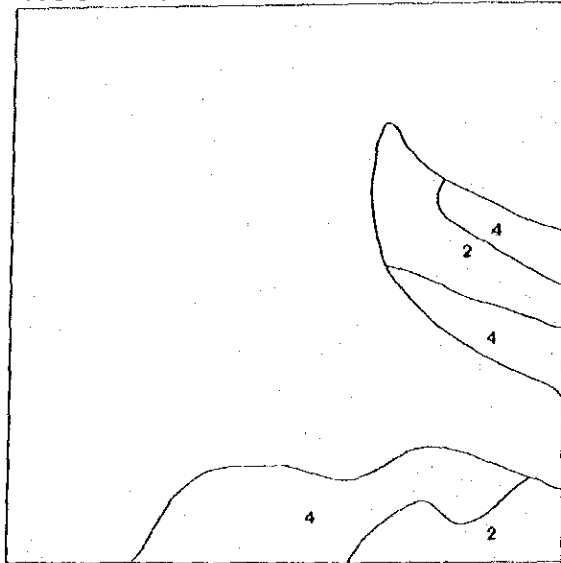


(Water covered area)

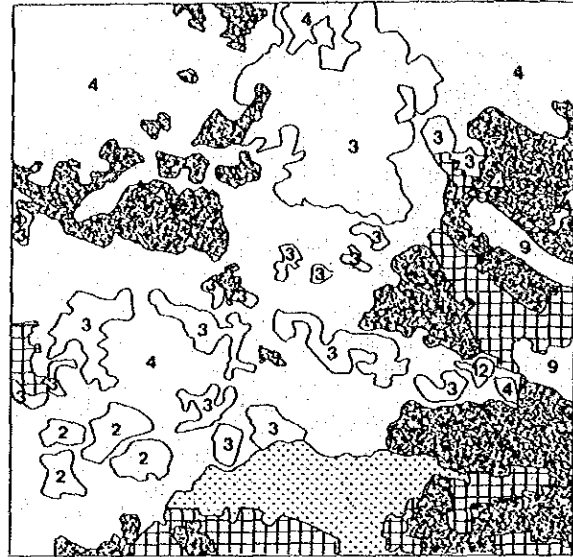
The area of landuse(Vegetation) (Km ²)		
	Forest	1.9
2	Shrub	5.4
3	Tall humidiherbosa	1.3
4	Short humidiherbosa	25.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	0.1
	Paddy field in rainy season	0.2
9	Fallow paddy field	1.4
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area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

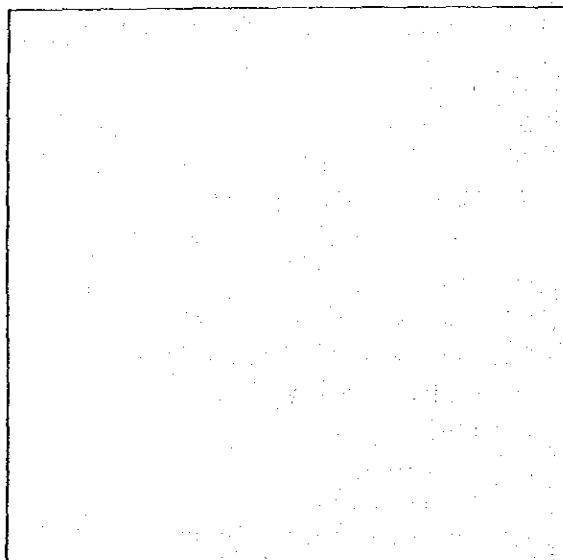
Sheet No. IV-5



(Landform)



(Landuse .Vegetation)

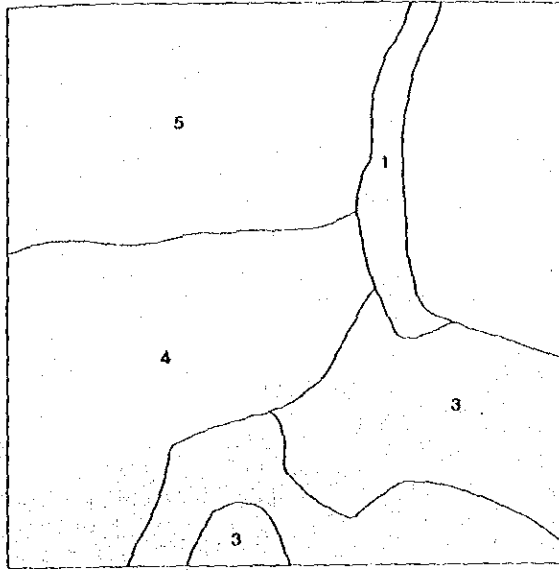


(Water covered area)

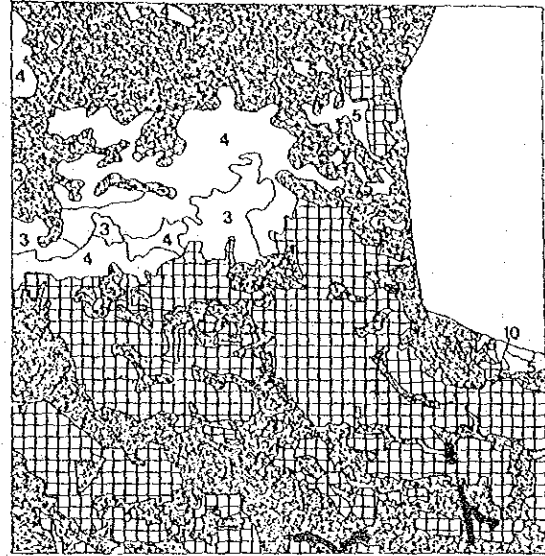
The area of landuse(Vegetation)(Km ²)		(Km ²)
	Forest	5.3
2	Shrub	1.2
3	Tall humidiherbosa	5.4
4	Short humidiherbosa	18.6
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	1.3
	Paddy field in rainy season	2.3
9	Fallow paddy field	1.9
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered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

Landform	1 Hill	3 Upper delta	5 Swamp
	2 Natural levee	4 Lower delta	
Land use	Forest	6 Floating grass	11 Pasture
Vegetation	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	

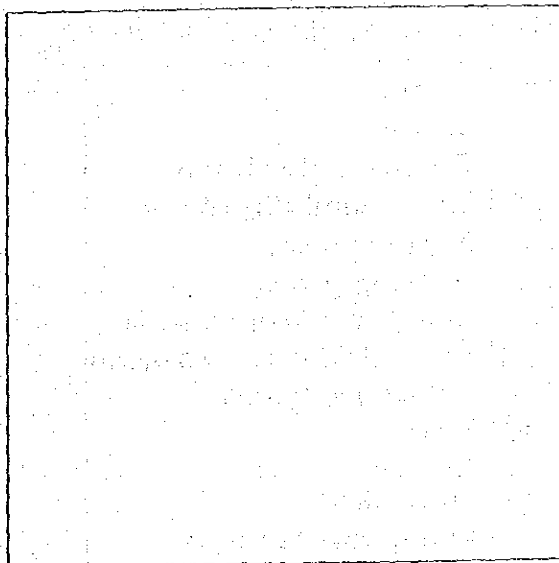
Sheet No. IV-6



(Landform)



(Landuse .Vegetation)

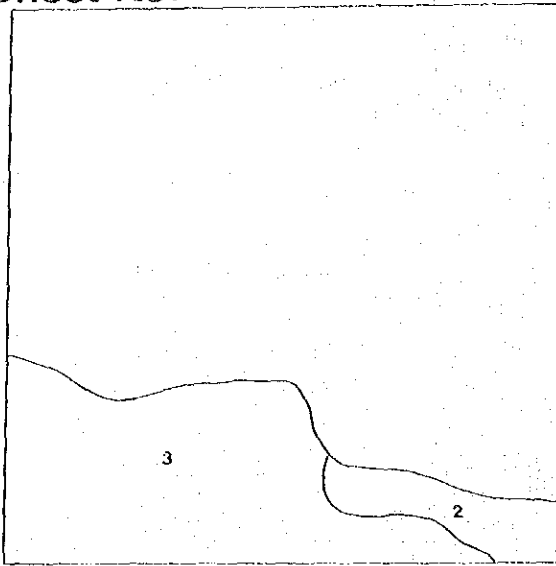


(Water covered area)

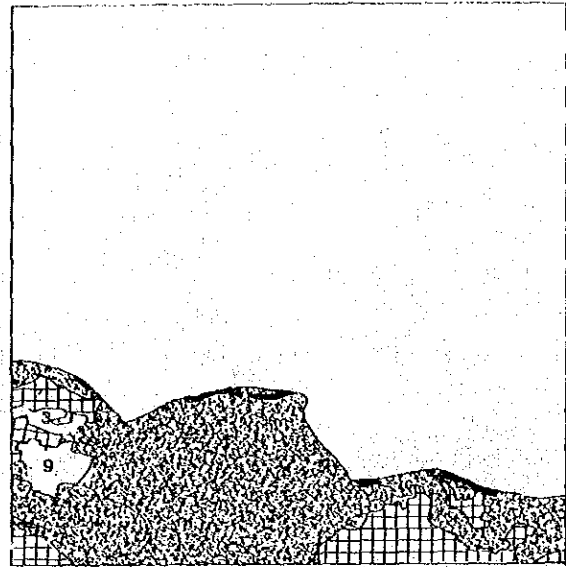
The area of landuse(Vegetation) (km ²)		
	Forest	13.2
2	Shrub	0.2
3	Tall humidherbosa	1.3
4	Short humidherbosa	3.4
5	Dry meadow	0.9
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	9.8
9	Fallow paddy field	0.7
10	Field	0.2
11	Pasture	-
12	Burnt field	-
13	Water covered area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

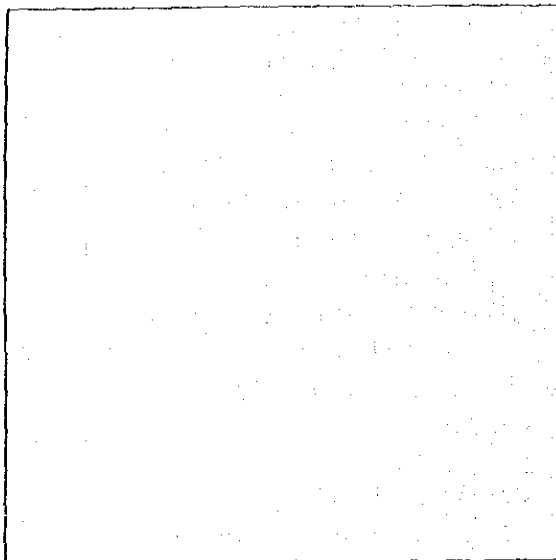
Sheet No. IV-7



(Landform)



(Landuse .Vegetation)

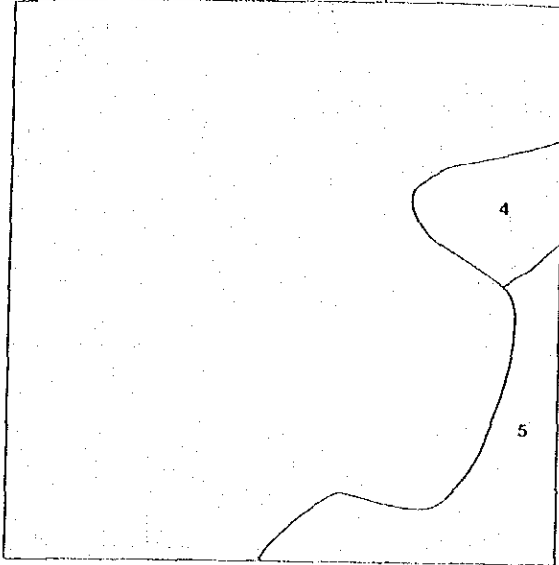


(Water covered area)

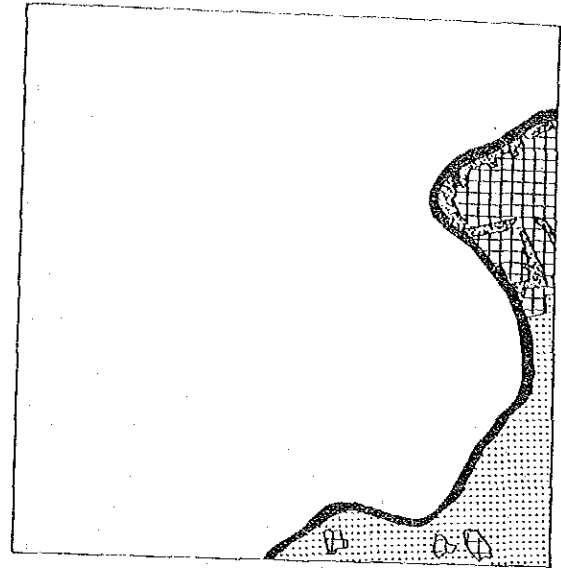
The area of landuse (Vegetation) (km ²)		
	Forest	3.2
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	4.7
9	Fallow paddy field	0.4
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential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

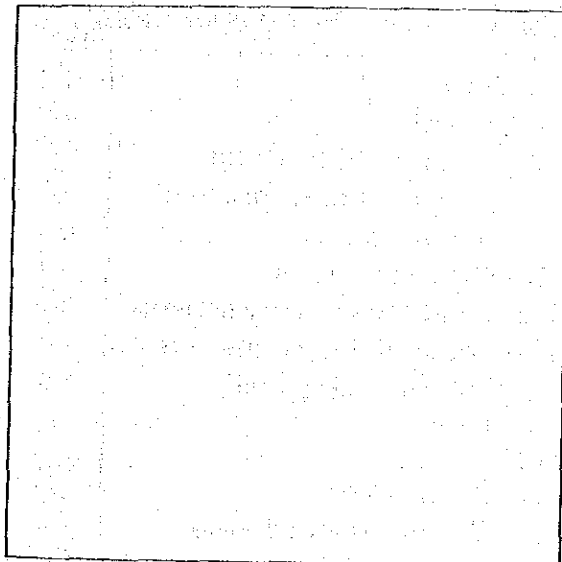
Sheet No. V-1



(Landform)



(Landuse .Vegetation)

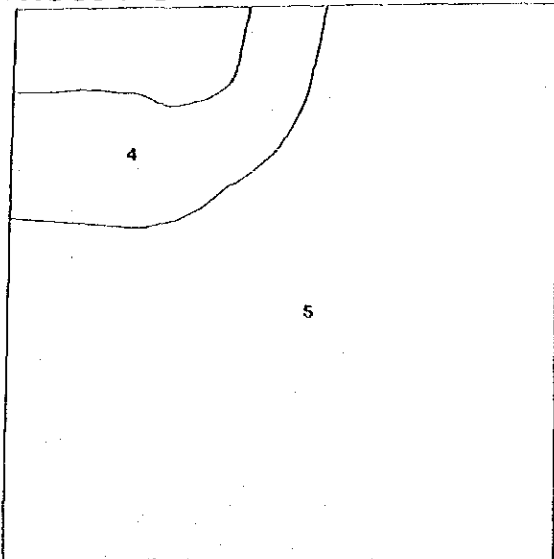


(Water covered area)

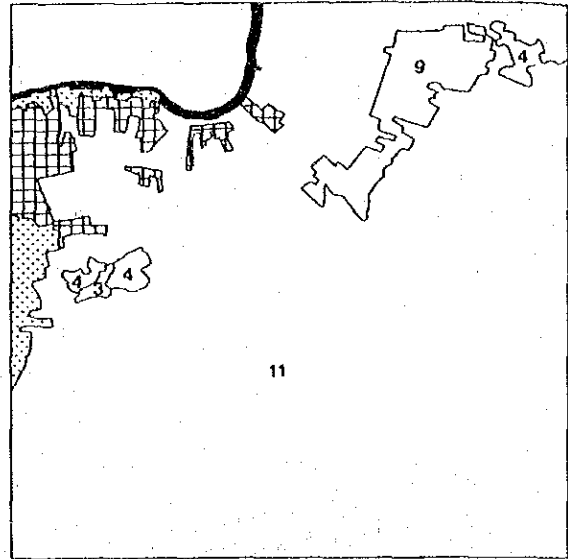
The area of landuse(Vegetation)		(km ²)
	Forest	0.4
2	Shrub	0.8
3	Tall humidherbosa	-
4	Short humidherbosa	0.1
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	1.2
	Paddy field in rainy season	1.2
9	Fallow paddy field	0.3
10	Field	-
11	Pasture	0.4
12	Burnt field	-
13	Water covered area	0.3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

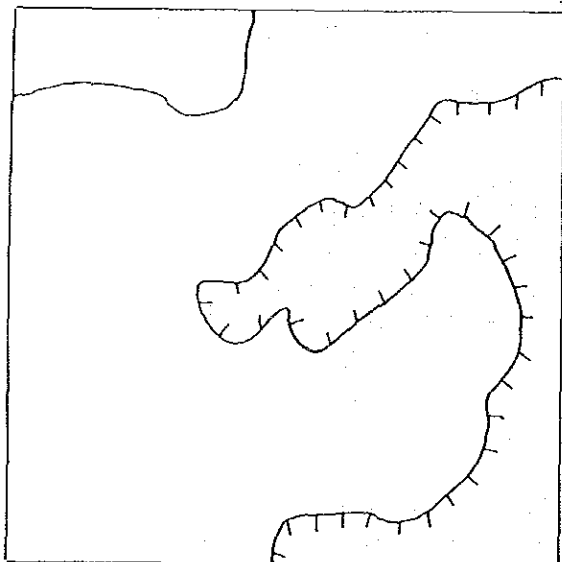
Sheet No. V-2



(Landform)



(Landuse .Vegetation)

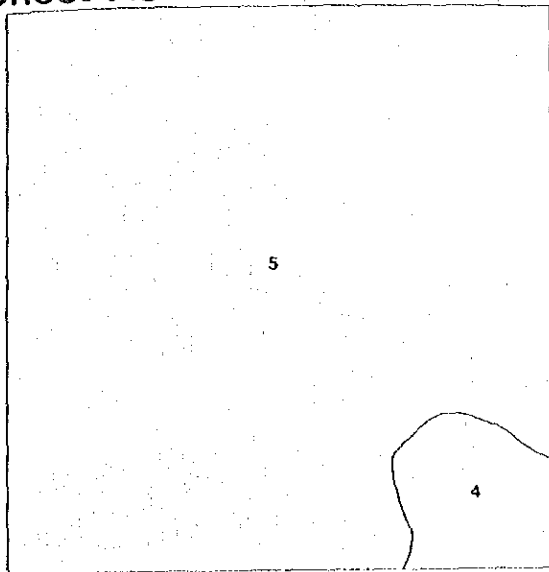


(Water covered area)

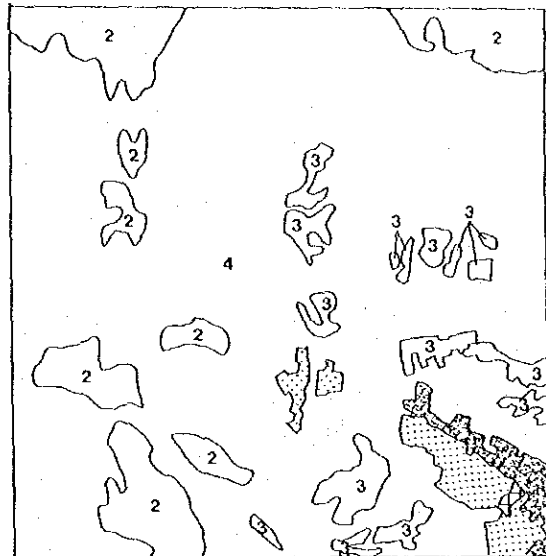
The area of landuse(Vegetation) (Km ²)	
	Forest 0.4
2	Shrub 0.9
3	Tall humidherbosa 0.3
4	Short humidherbosa 0.7
5	Dry meadow 0.1
6	Floating grass 0.1
	Paddy field in dry season 5.8
	Paddy field in rainy season 1.0
9	Fallow paddy field 1.9
10	Field -
11	Pasture 21.7
12	Burnt field 0.1
13	Water covered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

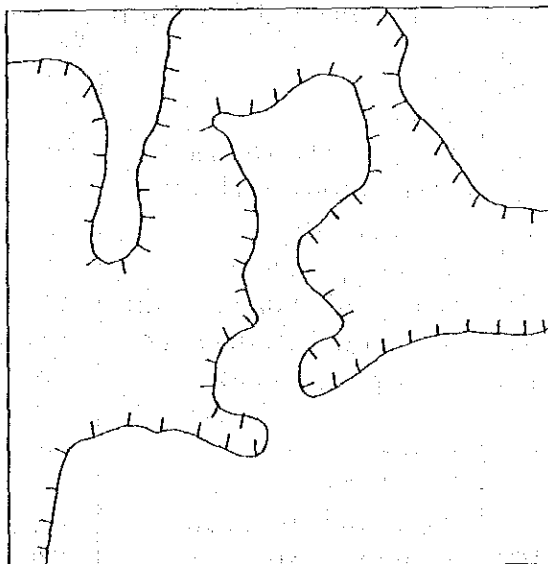
Sheet No. V-3



(Landform)



(Landuse .Vegetation)

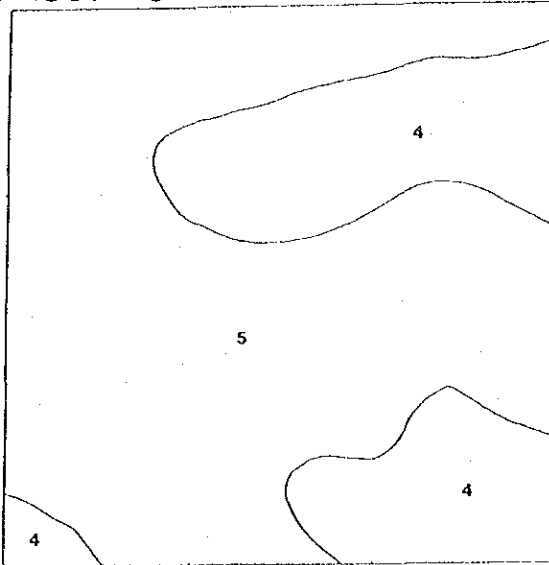


(Water covered area)

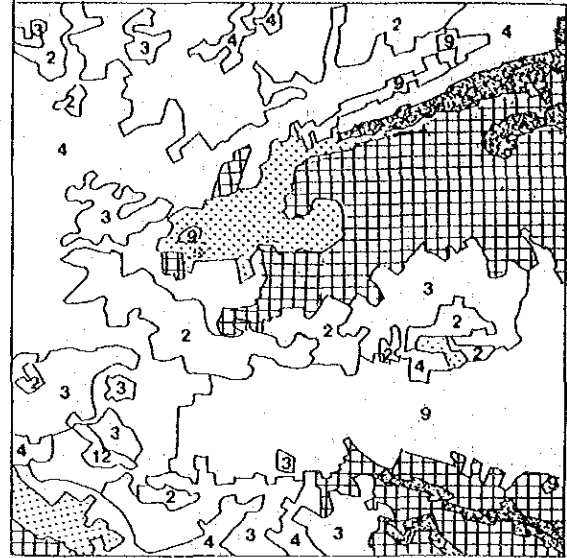
The area of landuse(Vegetation) (km ²)		
	Forest	0.6
2	Shrub	4.6
3	Tall humidherbosa	2.3
4	Short humidherbosa	16.2
5	Dry meadow	-
6	Floating grass	0.9
	Paddy field in dry season	2.9
	Paddy field in rainy season	0.1
9	Fallow paddy field	0.3
10	Field	-
11	Pasture	6.8
12	Burnt field	0.1
13	Water covered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

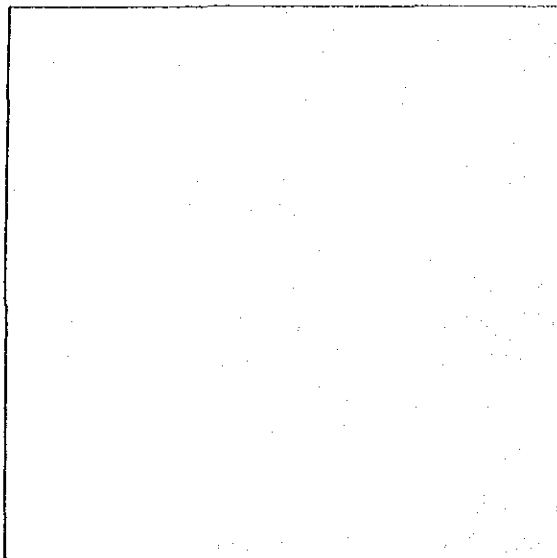
Sheet No. V-4



(Landform)



(Landuse .Vegetation)

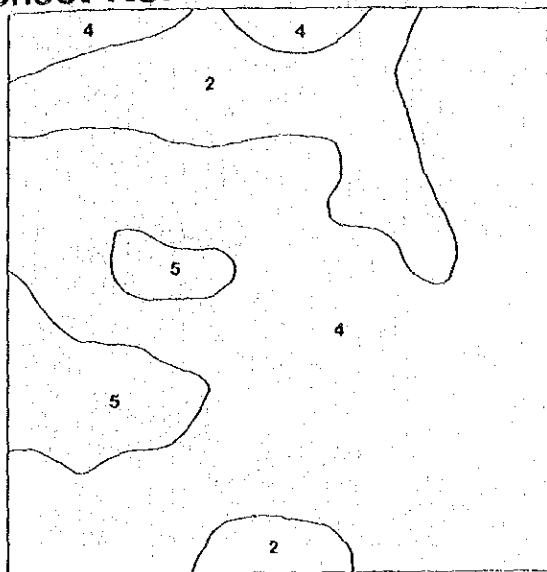


(Water covered area)

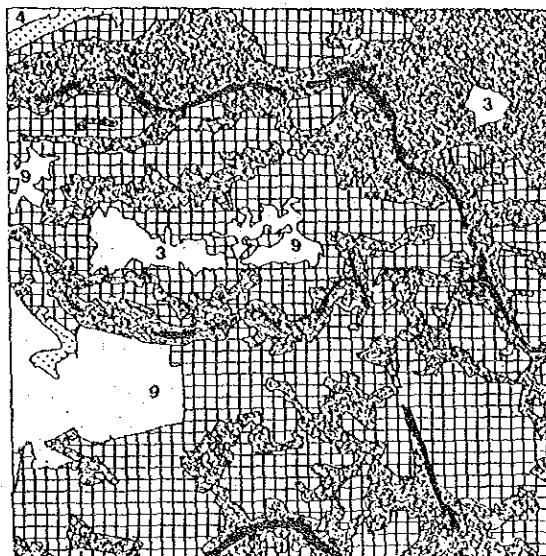
The area of landuse (Vegetation) (Km ²)	
	Forest 2.0
2	Shrub 7.1
3	Tall humidherbosa 5.1
4	Short humidherbosa 6.6
5	Dry meadow -
6	Floating grass -
	Paddy field in dry season 3.1
	Paddy field in rainy season 4.3
9	Fallow paddy field 7.4
10	Field -
11	Pasture -
12	Burnt field 0.1
13	Water covered area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

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

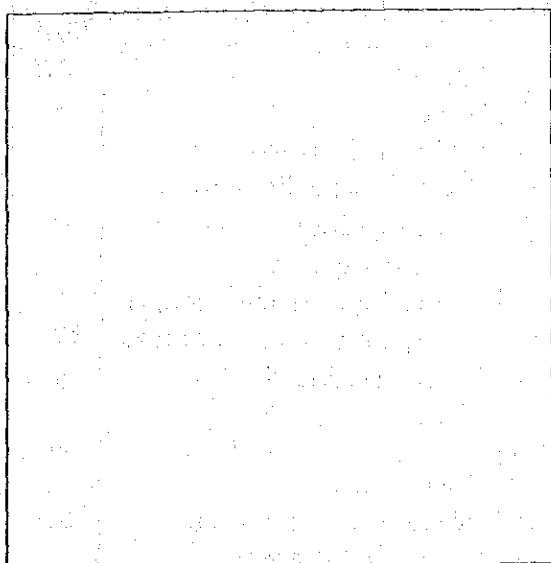
Sheet No. V-5



(Landform)



(Landuse .Vegetation)

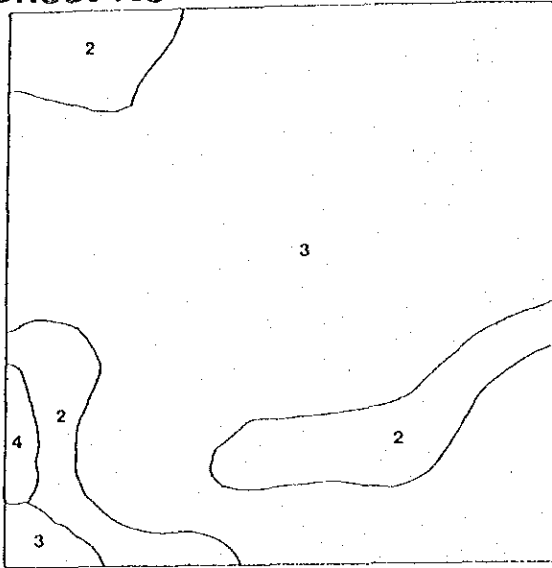


(Water covered area)

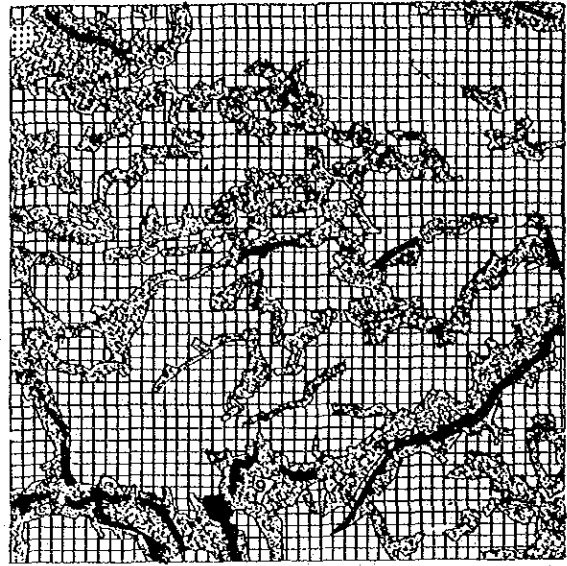
The area of landuse(Vegetation) (Km ²)	
	Forest 12.4
2	Shrub -
3	Tall humidiherbosa 1.1
4	Short humidiherbosa 0.1
5	Dry meadow 0.1
6	Floating grass -
	Paddy field in dry season 1.7
	Paddy field in rainy season 16.4
9	Fallow paddy field 2.6
10	Field 0.2
11	Pasture -
12	Burnt field -
13	Water covered area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

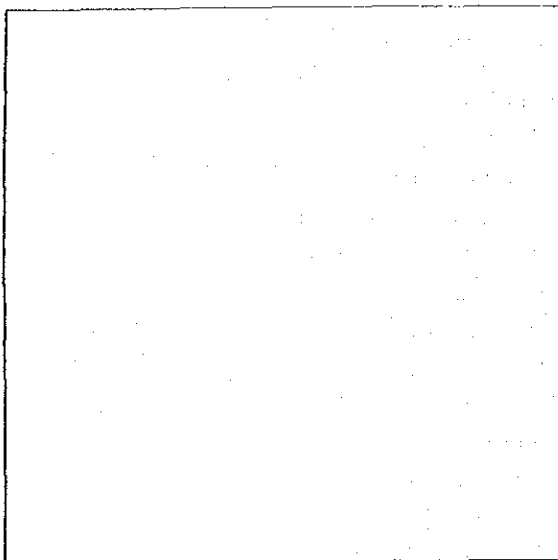
Sheet No. V-6



(Landform)



(Landuse .Vegetation)

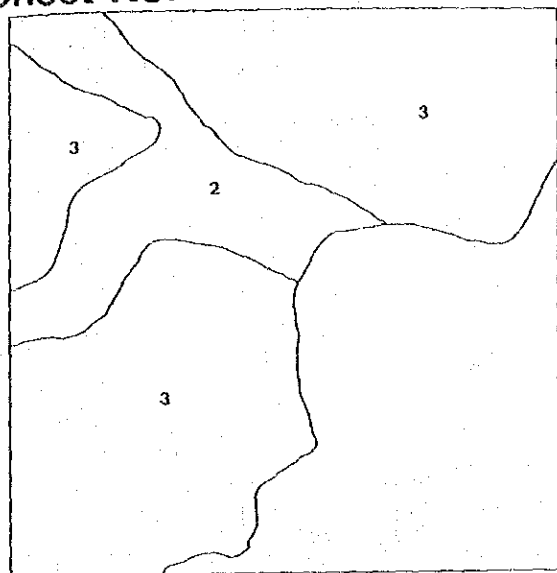


(Water covered area)

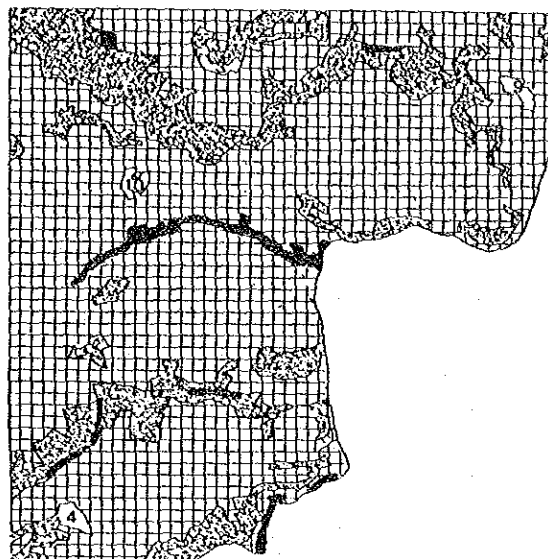
The area of landuse (Vegetation) (Km ²)	
	Forest 3.7
2	Shrub -
3	Tall humidiherbosa -
4	Short humidiherbosa -
5	Dry meadow -
6	Floating grass -
	Paddy field in dry season 0.1
	Paddy field in rainy season 32.0
9	Fallow paddy field 0.1
10	Field -
11	Pasture -
12	Burnt field -
13	Water covered area 0.1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

Landform	1 Hill	3 Upper delta	5 Swamp
	2 Natural levee	4 Lower delta	
Land use Vegetation	Forest 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 Fallow paddy field 10 Field	11 Pasture 12 Burnt field 13 Water covered area Residential area
Water covered area	In dry season	In rainy season	

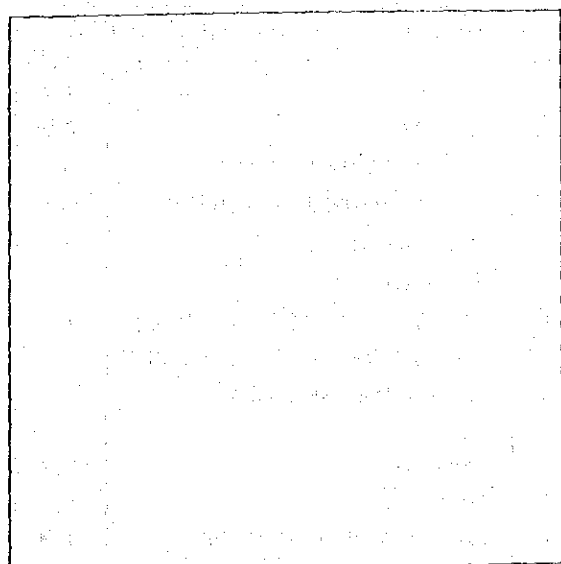
Sheet No. V-7



(Landform)



(Landuse .Vegetation)

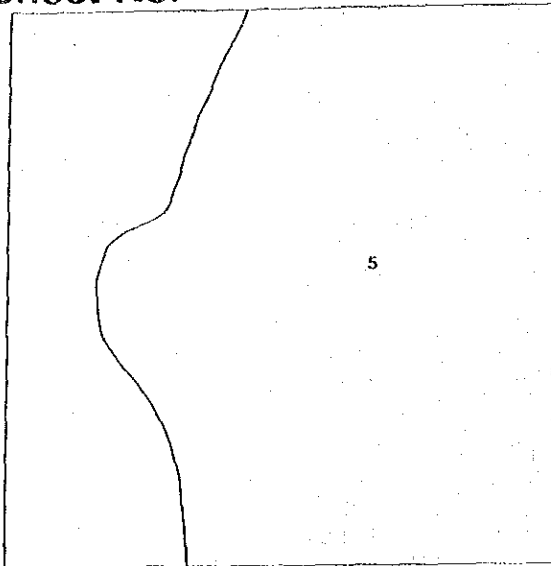


(Water covered area)

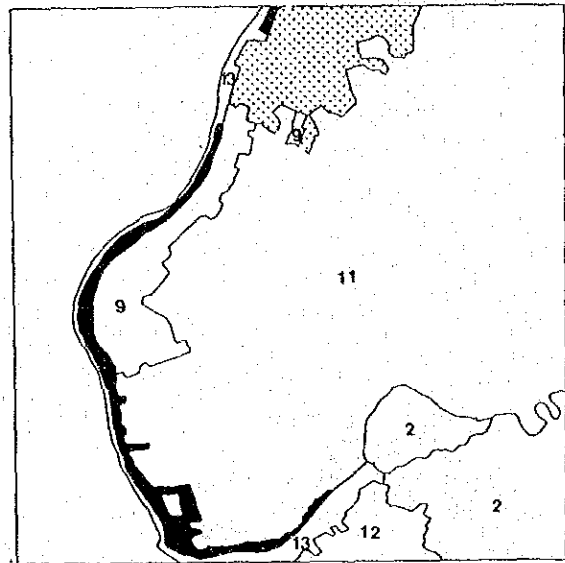
The area of landuse(Vegetation) (km ²)		
	Forest	1.8
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	24.4
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.2
	Residential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

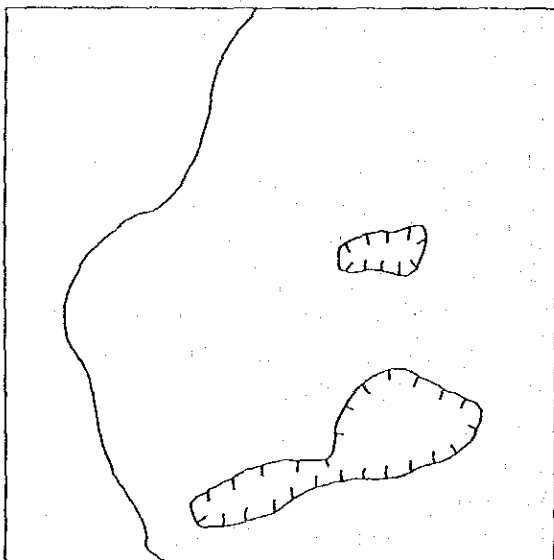
Sheet No. VI-1



(Landform)



(Landuse .Vegetation)

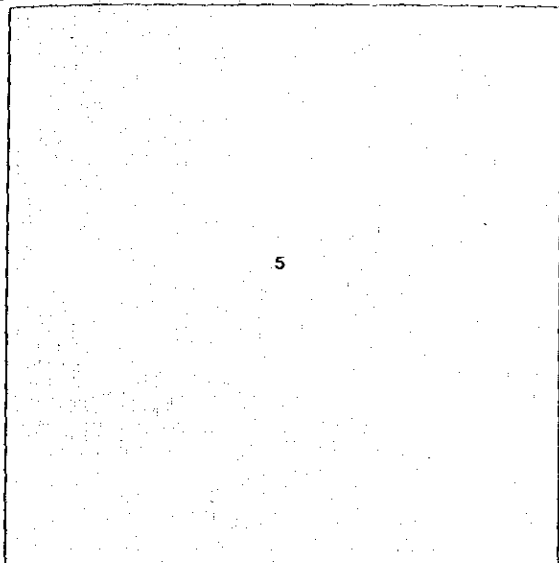


(Water covered area)

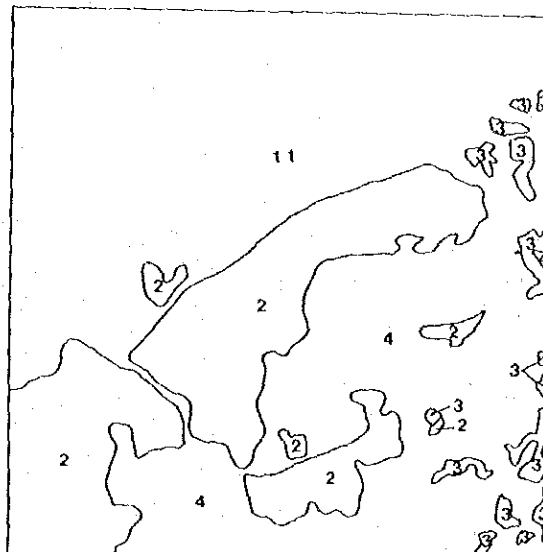
The area of landuse (Vegetation) (Hectare)		(Hectare)
	Forest	0.1
2	Shrub	2.2
3	Tall humidherbosa	-
4	Short humidherbosa	0.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	3.8
	Paddy field in rainy season	-
9	Fallow paddy field	2.1
10	Field	-
11	Pasture	17.1
12	Burnt field	-
13	Water covered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

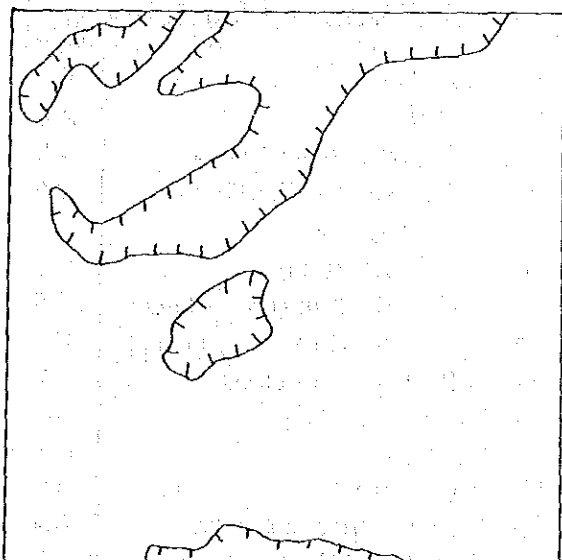
Sheet No. VI-2



(Landform)



(Landuse .Vegetation)

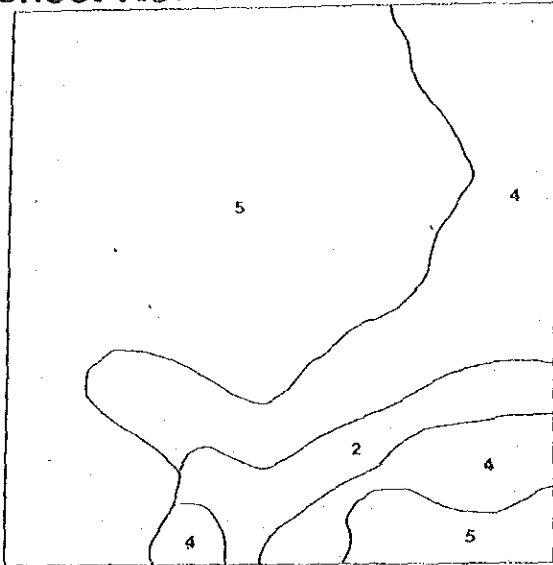


(Water covered area)

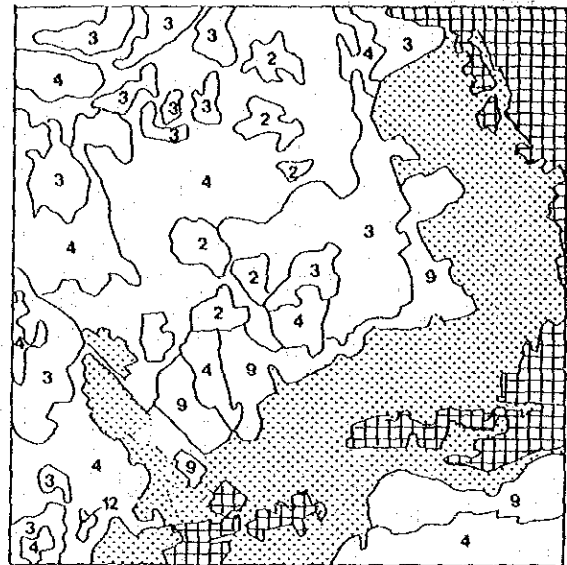
The area of landuse(Vegetation) (km ²)	
	Forest -
2	Shrub 6.7
3	Tall humidiherbosa 0.2
4	Short humidiherbosa 13.0
5	Dry meadow -
6	Floating grass -
	Paddy field in dry season 0.4
	Paddy field in rainy season -
9	Fallow paddy field -
10	Field -
11	Pasture 14.5
12	Burnt field -
13	Water covered area 1.2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

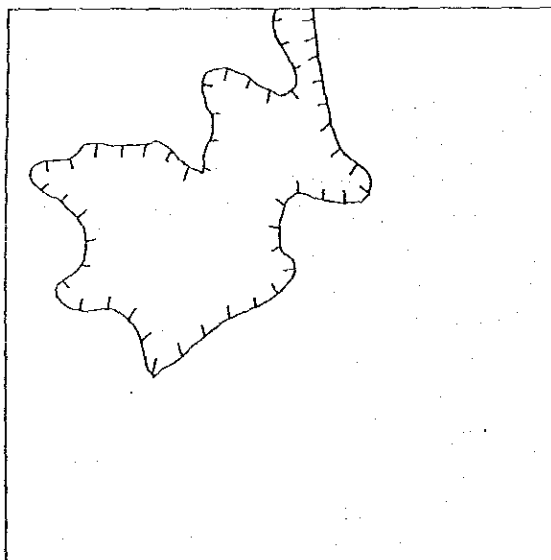
Sheet No. VI-3



(Landform)



(Landuse .Vegetation)

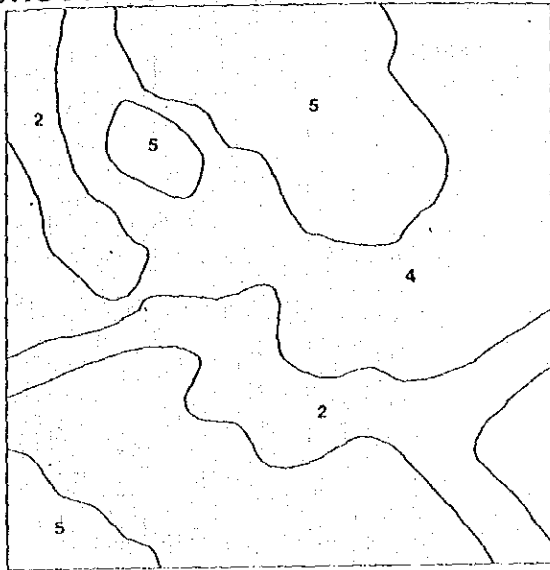


(Water covered area)

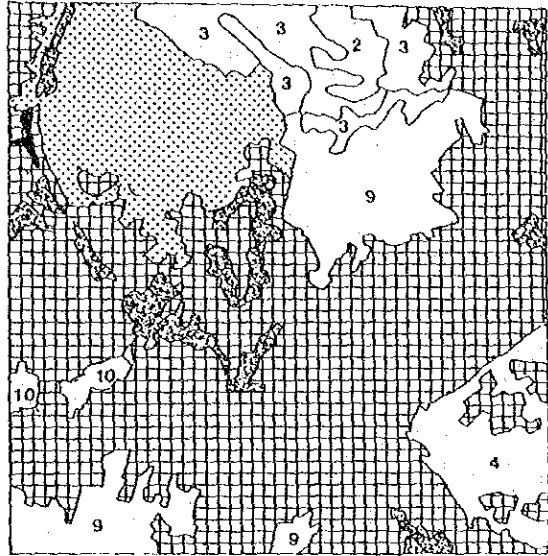
The area of landuse(Vegetation)(Km ²)		
	Forest	0.3
2	Shrub	2.6
3	Tall humidiherbosa	3.0
4	Short humidiherbosa	11.0
5	Dry meadow	-
6	Floating grass	0.1
	Paddy field in dry season	11.5
	Paddy field in rainy season	2.1
9	Fallow paddy field	4.9
10	Field	-
11	Pasture	0.1
12	Burnt field	0.2
13	Water covered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

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

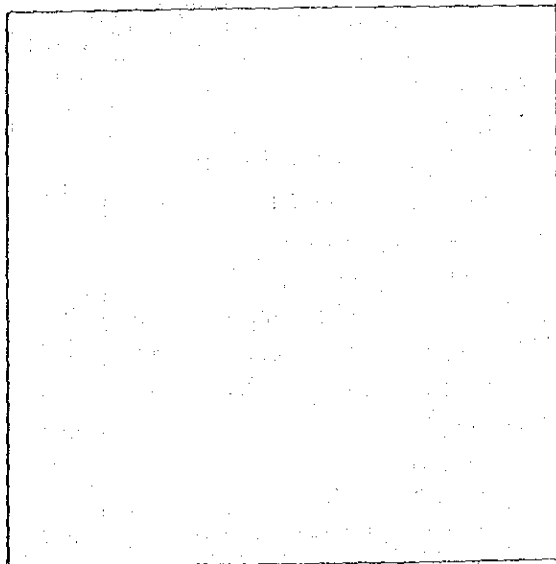
Sheet No. VI-4



(Landform)



(Landuse . Vegetation)

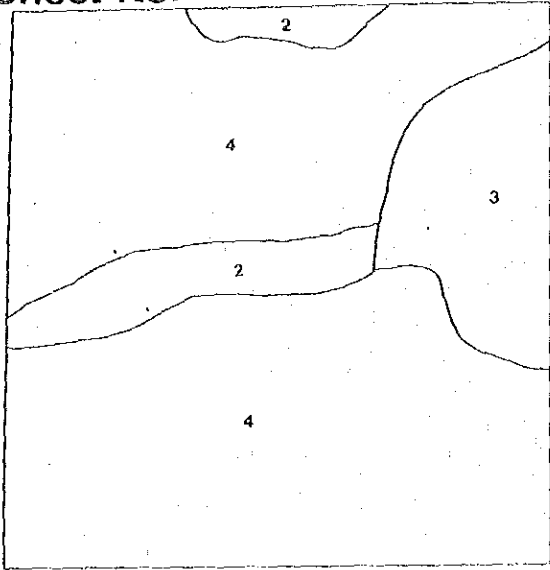


(Water covered area)

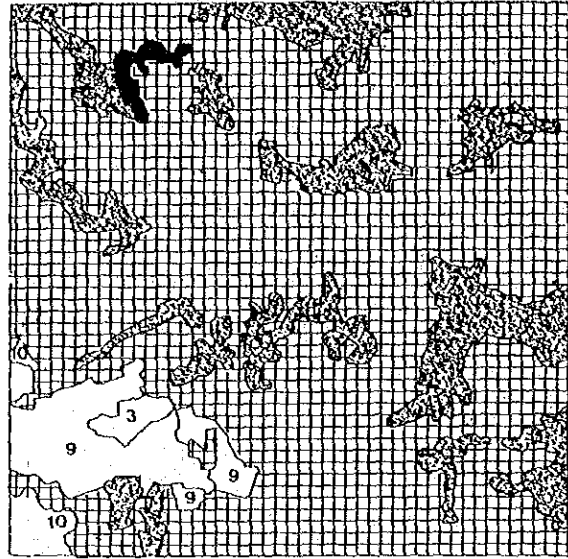
The area of landuse (Vegetation) (Km ²)	
	Forest 5.4
2	Shrub 0.6
3	Tall humidherbosa 0.8
4	Short humidherbosa 1.2
5	Dry meadow 1.0
6	Floating grass -
	Paddy field in dry season 3.4
	Paddy field in rainy season 16.7
9	Fallow paddy field 5.0
10	Field 0.7
11	Pasture -
12	Burnt field -
13	Water covered area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

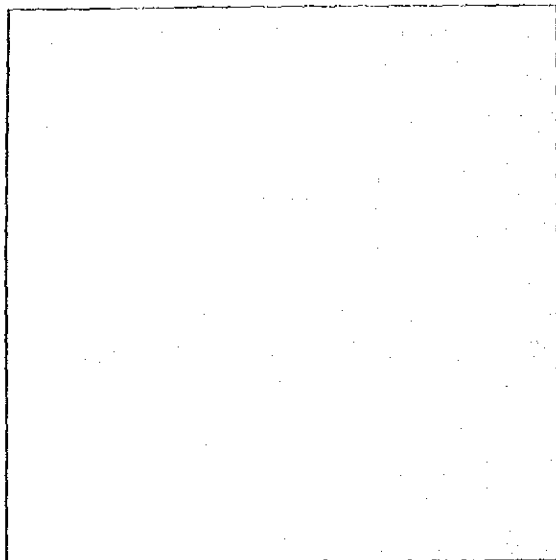
Sheet No. VI-5



(Landform)



(Landuse . Vegetation)

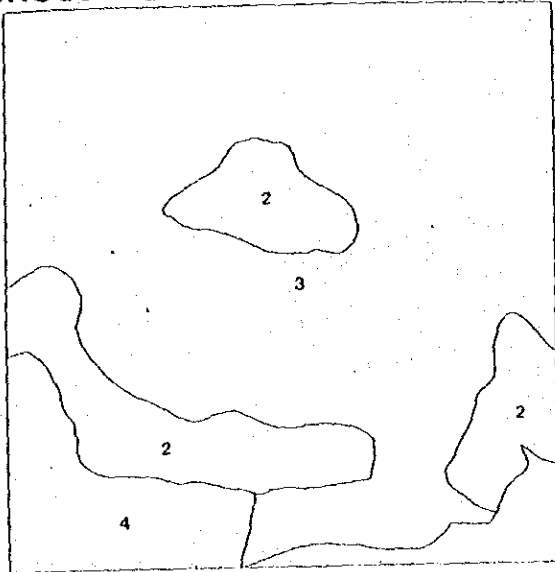


(Water covered area)

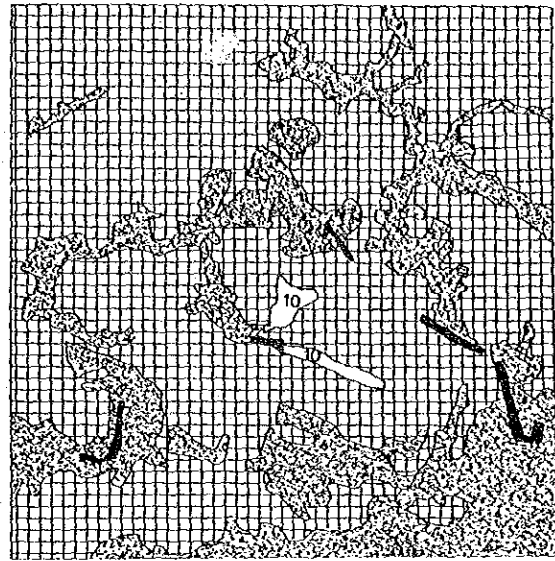
The area of landuse (Vegetation) (Km ²)		
	Forest	10.3
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	0.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	0.2
	Paddy field in rainy season	20.0
9	Fallow paddy field	2.2
10	Field	0.8
11	Pasture	-
12	Burnt field	-
13	Water covered area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

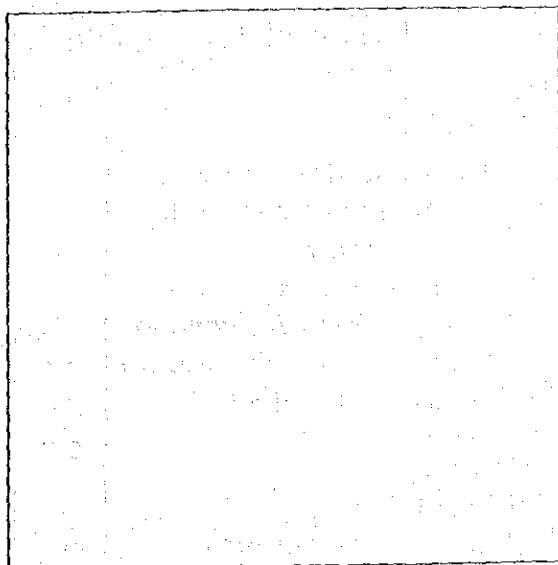
Sheet No. VI-6



(Landform)



(Landuse . Vegetation)

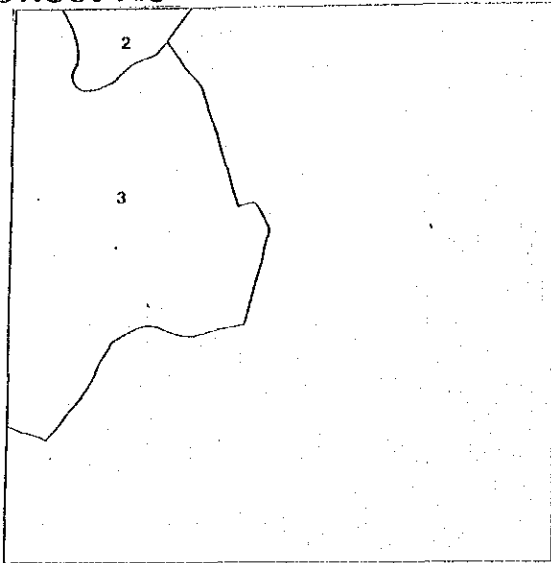


(Water covered area)

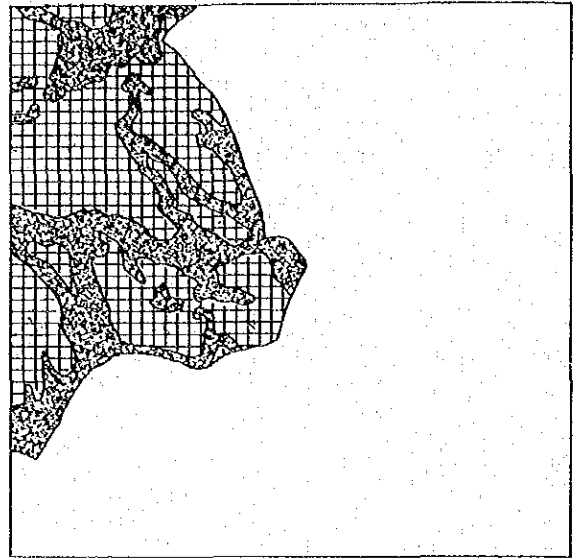
The area of landuse (Vegetation) (km ²)		
	Forest	5.3
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	-
5	Dry meadow	0.2
6	Floating grass	-
	Paddy field in dry season)	-
	Paddy field in rainy season)	27.7
9	Fallow paddy field	-
10	Field	0.7
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.2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

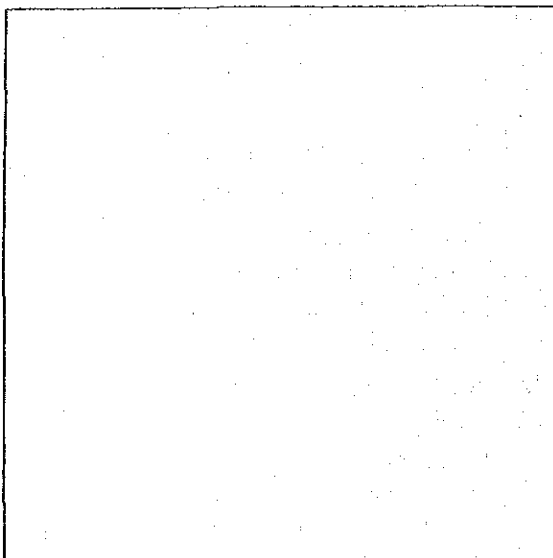
Sheet No. VI-7



(Landform)



(Landuse .Vegetation)

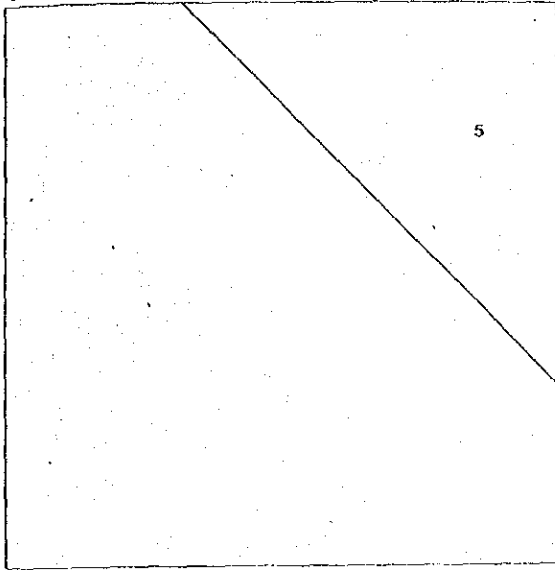


(Water covered area)

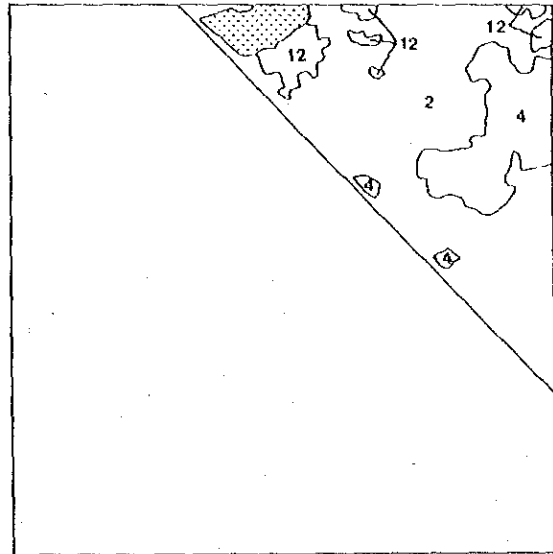
The area of landuse (Vegetation) (Km ²)		
	Forest	3.3
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	6.1
9	Fallow paddy field	-
10	Field	0.2
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.1
	Residential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

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

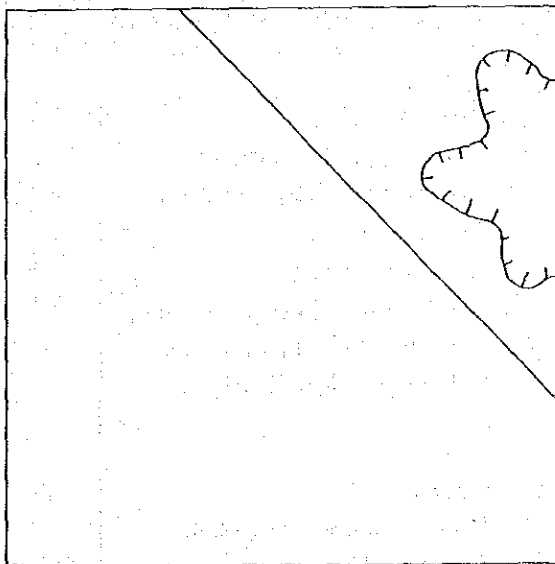
Sheet No. VII-1



(Landform)



(Landuse . Vegetation)

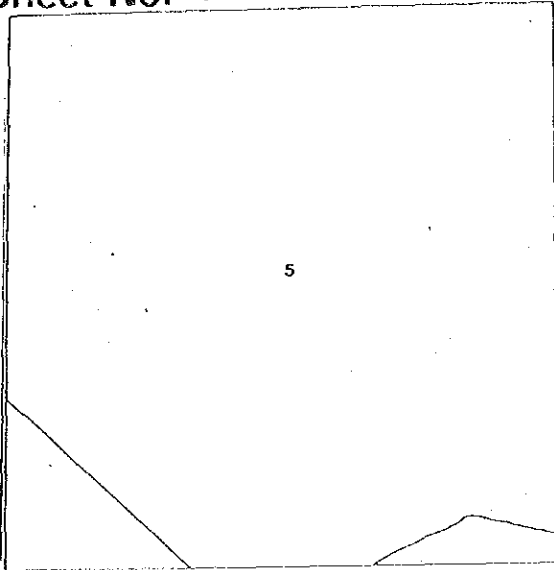


(Water covered area)

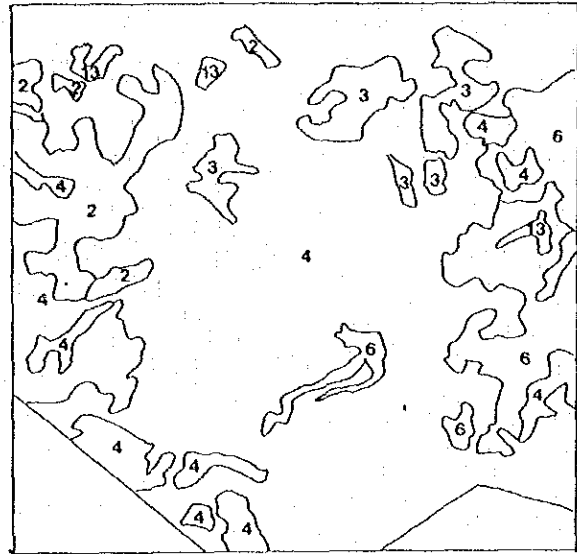
The area of landuse (Vegetation) (Km ²)	
	Forest -
2	Shrub 5.5
3	Tall humidiherbosa -
4	Short humidiherbosa 0.3
5	Dry meadow -
6	Floating grass -
	Paddy field in dry season -
	Paddy field in rainy season 0.5
9	Fallow paddy field -
10	Field 0.1
11	Pasture -
12	Burnt field 0.5
13	Water covered area 0.2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

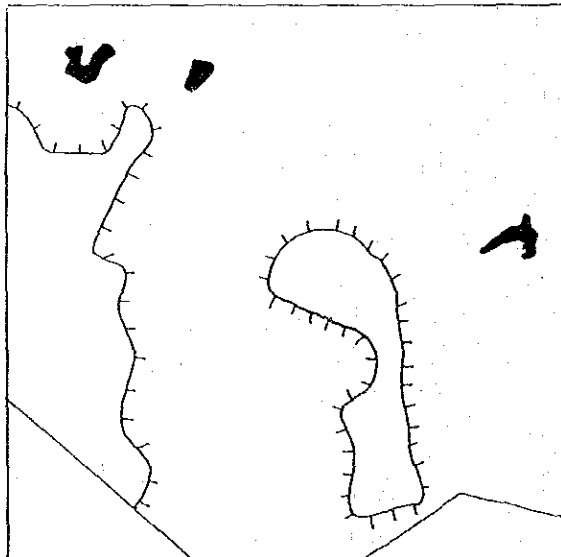
Sheet No. VII-2



(Landform)



(Landuse .Vegetation)

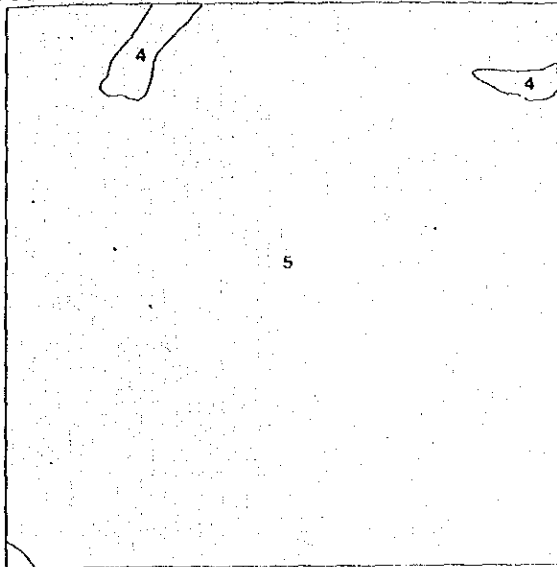


(Water covered area)

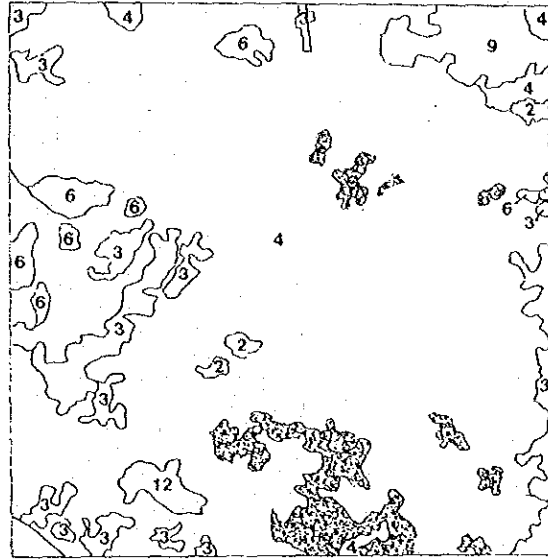
The area of landuse (Vegetation) (km ²)	
	Forest -
2	Shrub 6.6
3	Tall humidherbosa 2.7
4	Short humidherbosa 19.5
5	Dry meadow -
6	Floating grass 2.9
	Paddy field in dry season 0.1
	Paddy field in rainy season -
9	Fallow paddy field -
10	Field -
11	Pasture -
12	Burnt field 0.2
13	Water covered area 1.7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

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

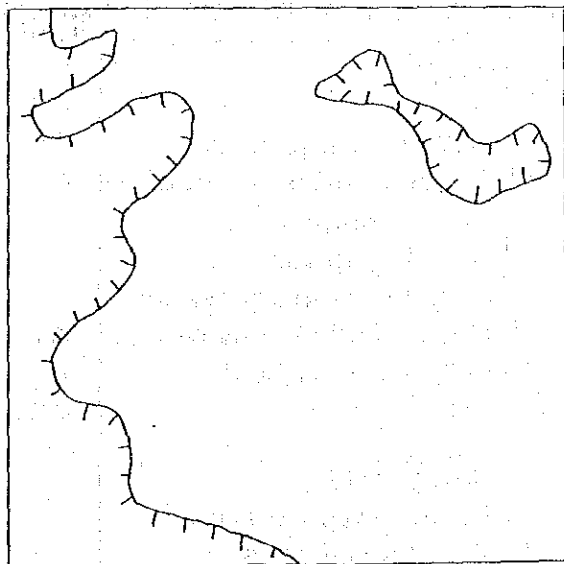
Sheet No. VII-3



(Landform)



(Landuse .Vegetation)

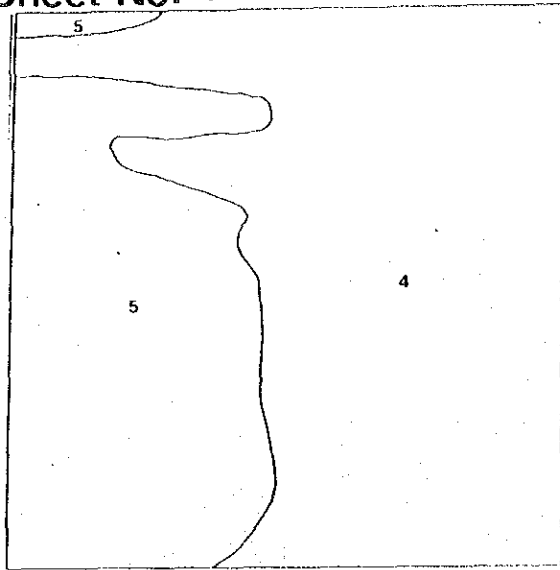


(Water covered area)

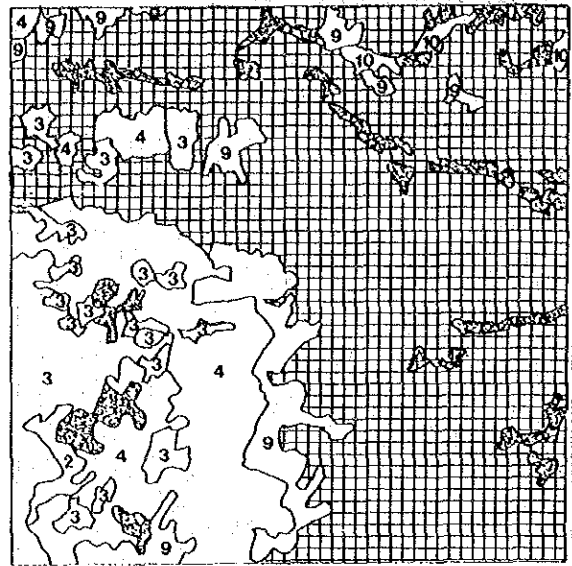
The area of landuse (Vegetation) (Km ²)	
	Forest 2.4
2	Shrub 0.4
3	Tall humidiherbosa 2.6
4	Short humidiherbosa 24.2
5	Dry meadow -
6	Floating grass 2.1
	Paddy field in dry season 1.2
	Paddy field in rainy season 0.1
9	Fallow paddy field 1.3
10	Field -
11	Pasture 0.3
12	Burnt field -
13	Water covered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

Landform	1	Hill	3	Upper delta	5	Swamp
	2	Natural levee	4	Lower delta		
Land use Vegetation		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		

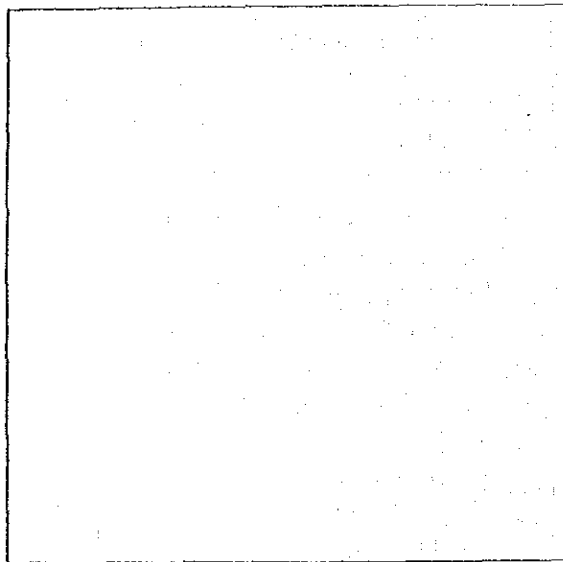
Sheet No. VII-4



(Landform)



(Landuse .Vegetation)

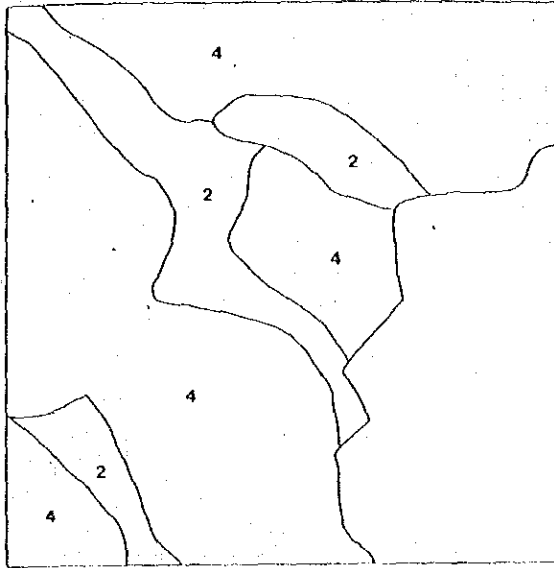


(Water covered area)

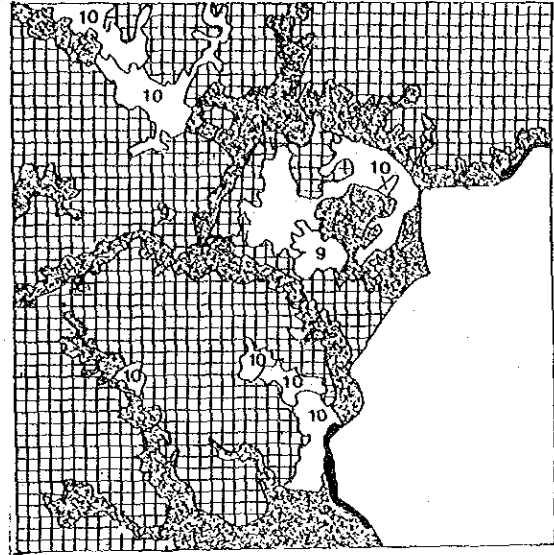
The area of landuse(Vegetation) (Km ²)		
	Forest	1.9
2	Shrub	0.7
3	Tall humidherbosa	2.3
4	Short humidherbosa	6.5
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	202
9	Fallow paddy field	4.2
10	Field	0.2
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	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 humidherbosa		Paddy field in rainy season	13	Water covered area
	4	Short humidherbosa	9	Fallow paddy field		Residential area
	5	Dry meadow	10	Field		
Water covered area		In dry season		In rainy season		

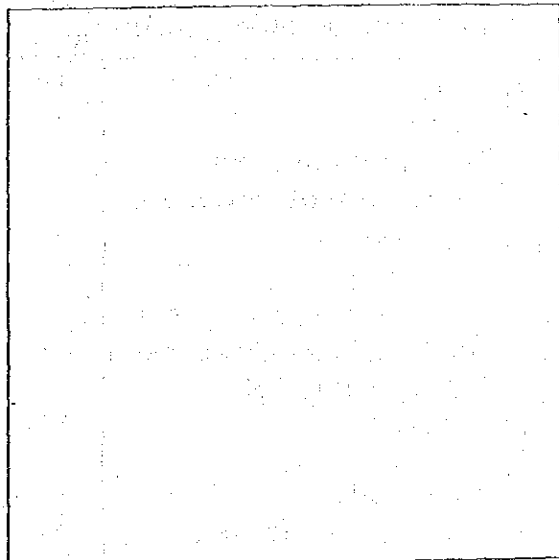
Sheet No. VII-5



(Landform)



(Landuse .Vegetation)

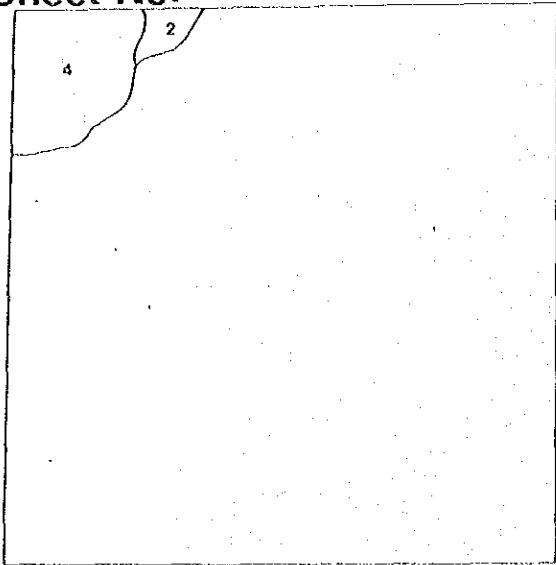


(Water covered area)

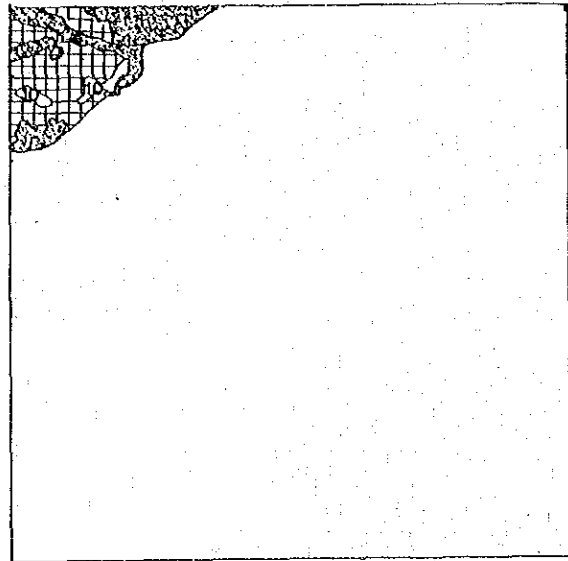
The area of landuse(Vegetation)(Km ²)		
	Forest	1.8
2	Shrub	-
3	Tall humidiherbosa	-
4	Short humidiherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	24.2
9	Fallow paddy field	1.2
10	Field	1.1
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential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

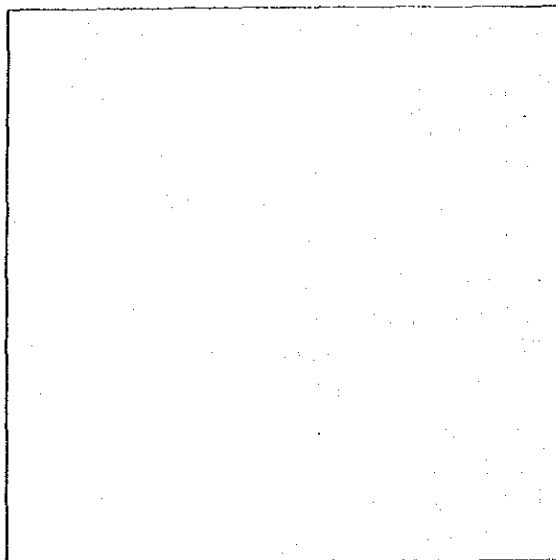
Sheet No. VII-6



(Landform)



(Landuse .Vegetation)



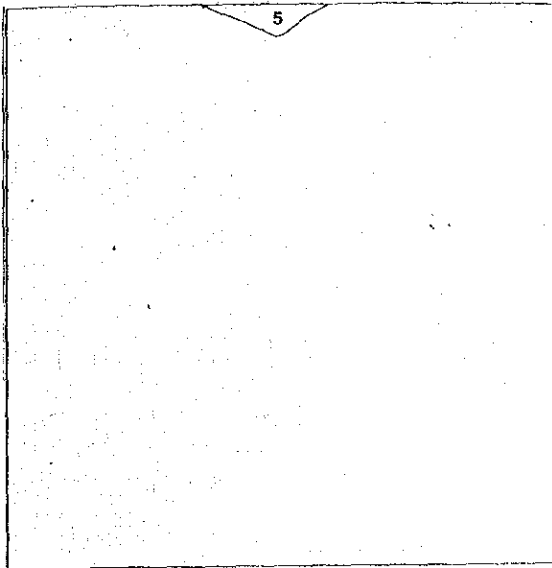
(Water covered area)

The area of landuse(Vegetation) (Km²)

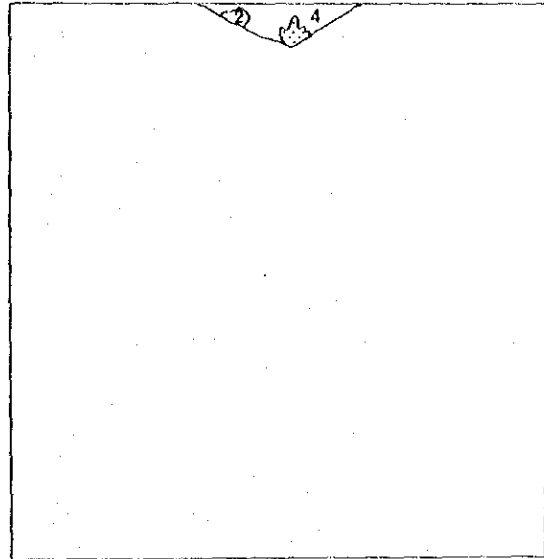
	Forest	0.4
2	Shrub	-
3	Tall humidherbosa	-
4	Short humidherbosa	-
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	1.4
9	Fallow paddy field	-
10	Field	0.1
11	Pasture	-
12	Burnt field	-
13	Water covered area	-
	Residential area	-

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 humidherbosa	Paddy field in rainy season	13 Water covered area
	4 Short humidherbosa	9 Fallow paddy field	Residential area
	5 Dry meadow	10 Field	
Water covered area		In dry season	In rainy season

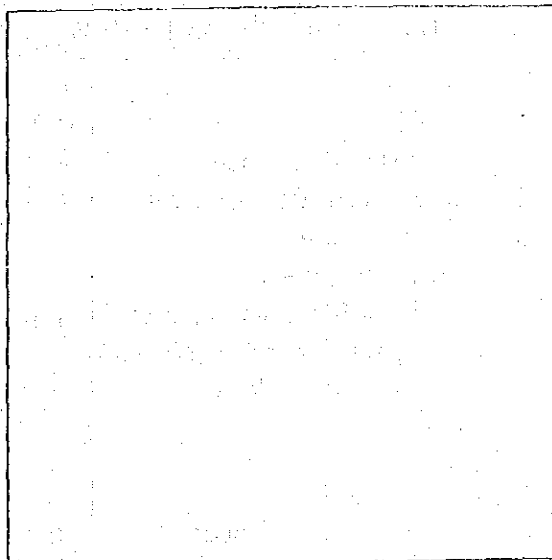
Sheet No. VIII-2



(Landform)



(Landuse .Vegetation)

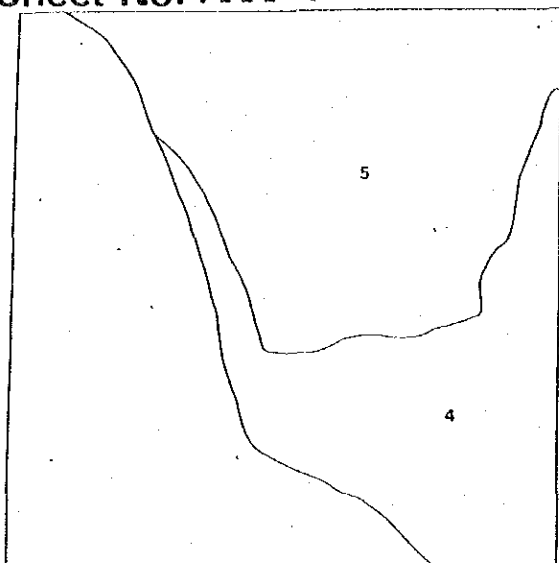


(Water covered area)

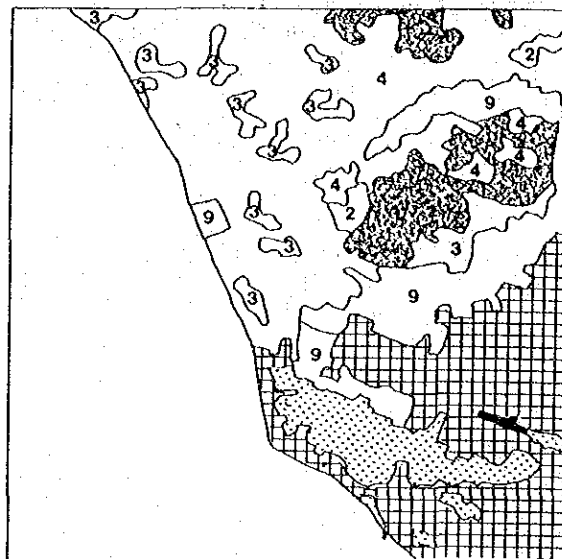
The area of landuse (Vegetation) (Km ²)		
	Forest	-
2	Shrub	0.1
3	Tall humidherbosa	-
4	Short humidherbosa	0.1
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	0.1
	Paddy field in rainy season	-
9	Fallow paddy field	-
10	Field	-
11	Pasture	-
12	Burnt field	-
13	Water covered area	0.1
	Residential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

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

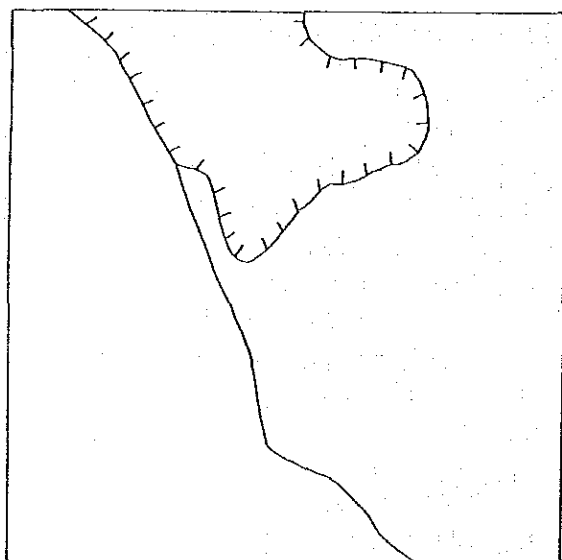
Sheet No. VIII-3



(Landform)



(Landuse .Vegetation)

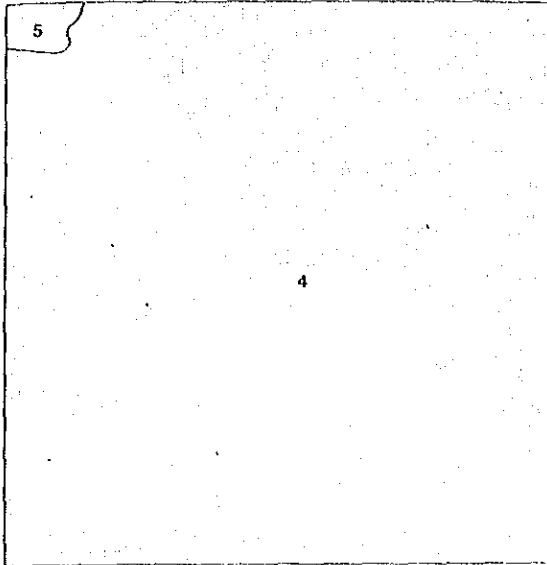


(Water covered area)

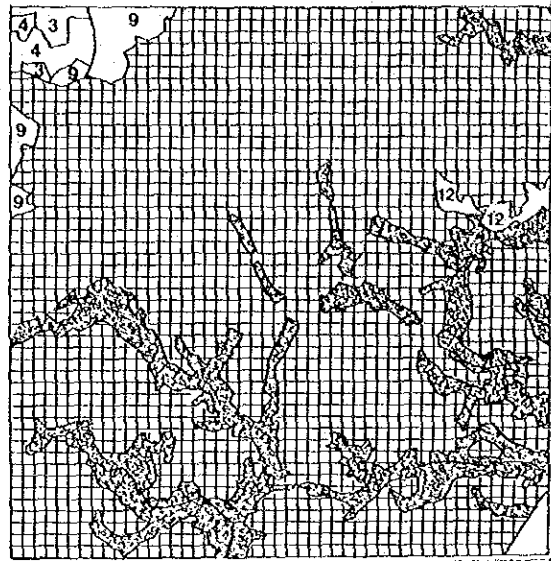
The area of landuse (Vegetation) (km ²)	
	Forest 1.7
2	Shrub 0.1
3	Tall humidiherbosa 0.3
4	Short humidiherbosa 7.0
5	Dry meadow -
6	Floating grass -
	Paddy field in dry season 1.9
	Paddy field in rainy season 7.2
9	Fallow paddy field 3.5
10	Field -
11	Pasture -
12	Burnt field -
13	Water covered area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

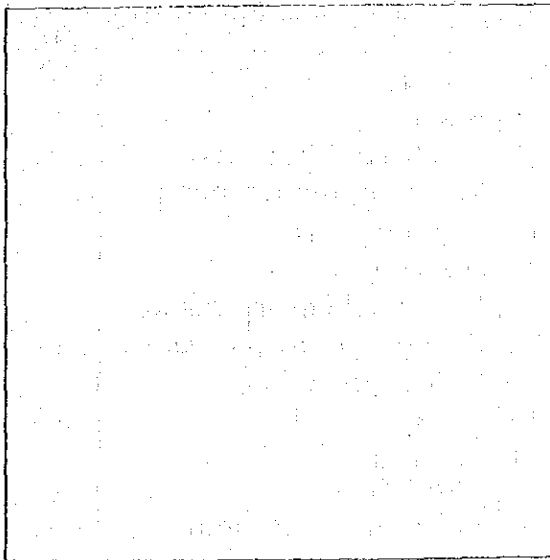
Sheet No. VIII-4



(Landform)



(Landuse. Vegetation)

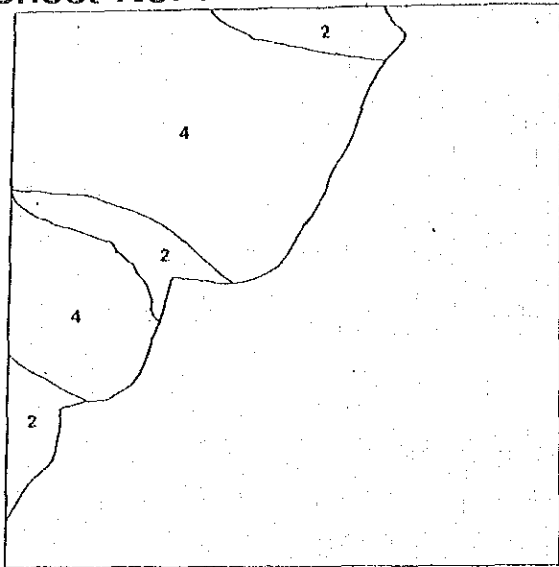


(Water covered area)

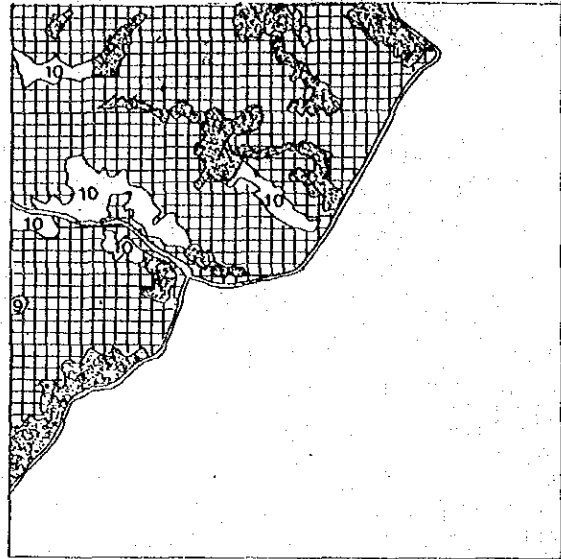
The area of landuse (Vegetation) (Km ²)		
	Forest	0.9
2	Shrub	-
3	Tall humidherbosa	0.1
4	Short humidherbosa	0.2
5	Dry meadow	-
6	Floating grass	-
	Paddy field in dry season	-
	Paddy field in rainy season	33.5
9	Fallow paddy field	0.6
10	Field	0.5
11	Pasture	-
12	Burnt field	-
13	Water covered area	-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

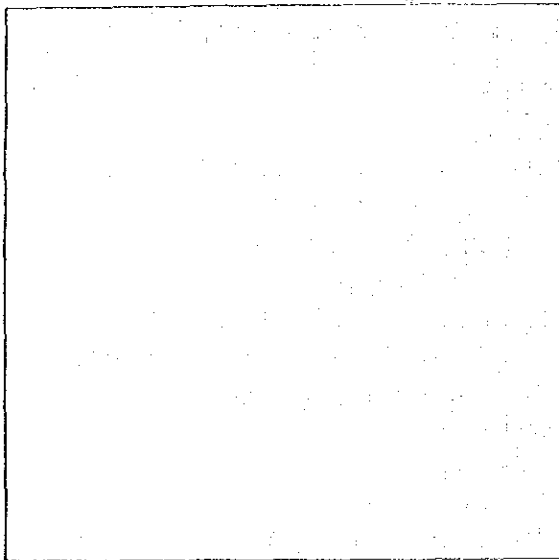
Sheet No. VIII-5



(Landform)



(Land use . Vegetation)

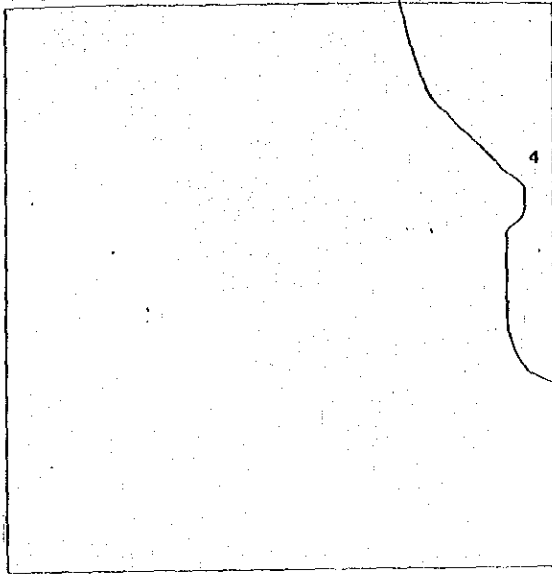


(Water covered area)

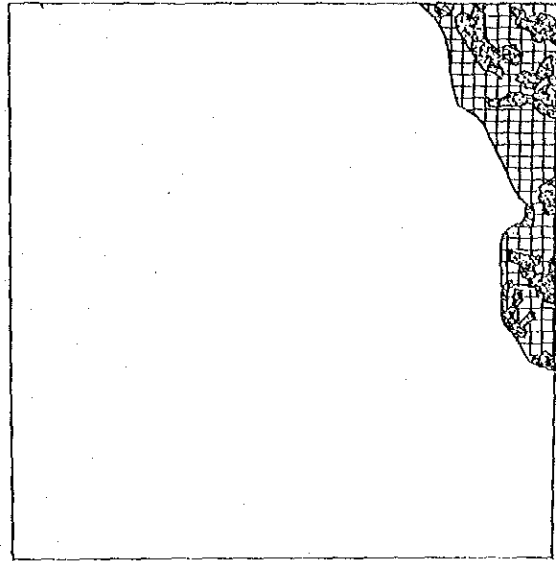
The area of land use (Vegetation) (Km ²)	
	Forest 0.4
2	Shrub -
3	Tall humidherbosa -
4	Short humidherbosa -
5	Dry meadow -
6	Floating grass -
	Paddy field in dry season -
	Paddy field in rainy season 12.8
9	Fallow paddy field -
10	Field 0.7
11	Pasture -
12	Burnt field -
13	Water covered area -
	Residential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

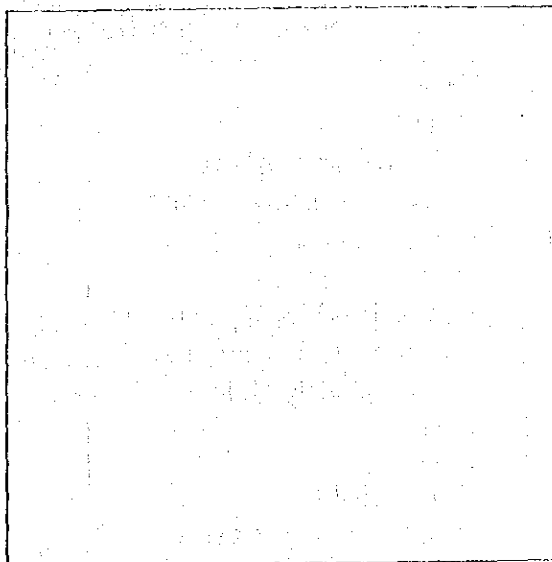
Sheet No. IX-3



(Landform)



(Landuse .Vegetation)

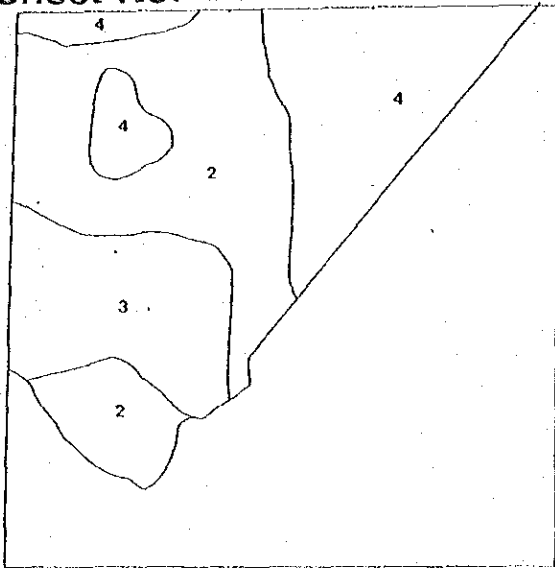


(Water covered area)

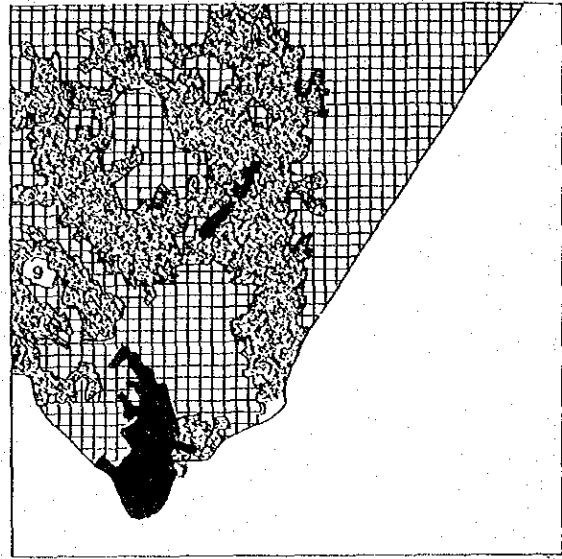
The area of landuse(Vegetation) (Km ²)	
	Forest 0.8
2	Shrub -
3	Tall humidherbosa -
4	Short humidherbosa -
5	Dry meadow -
6	Floating grass -
	Paddy field in dry season -
	Paddy field in rainy season 1.9
9	Fallow paddy field 0.1
10	Field -
11	Pasture -
12	Burnt field -
13	Water covered area -
	Residential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

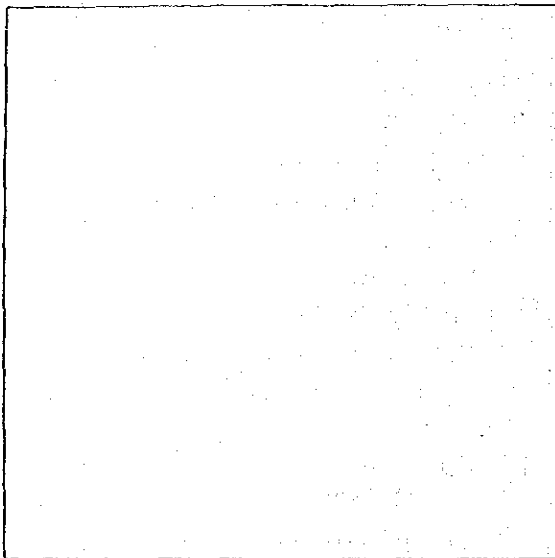
Sheet No. IX-4



(Landform)



(Landuse .Vegetation)



(Water covered area)

The area of landuse (Vegetation) (Km ²)	
	Forest 6.5
2	Shrub -
3	Tall humidherbosa -
4	Short humidherbosa -
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 humidherbosa	Paddy field in rainy season	13 Water covered area
	4 Short humidherbosa	9 Fallow paddy field	Residential area
	5 Dry meadow	10 Field	
Water covered area	In dry season	In rainy season	

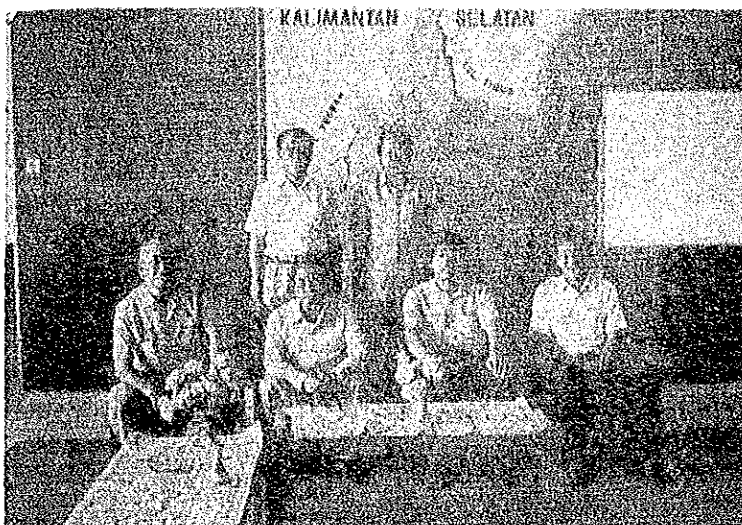
16. 参 考

16 - 1 資 料

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16 - 2 文 献

- (1) インドネシア共和国カリマンタン バリト河流域開発計画調査報告書
昭和46年 3月 OTCA
- (2) インドネシア共和国バリト河流域地形図作成事業
昭和49年 3月 OTCA
- (3) Report on Topographic Mapping Project of the Barito River Basin.
Republic of Indonesia March, 1974. OTCA
- (4) Manual of Photogrammetry with Particular Reference to the Barito
River Basin Development in Kalimantan, Republic of Indonesia
March 1974. OTCA
- (5) インドネシア国ネガラ河流域地形図作成事業 事前調査報告書
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- (6) Checking and Adjustment of Elevation of the Existing Bench Marks
in and around 1:10,000 Scale Photo Map Making Area Based on the
Available Existing Data. 25th Aug. 1984. Mosaic Photo Map Project
Team of the Downstream Area of the Negara River Basin in South
Malimantan.
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Indonesia. 2nd Year. 1st Oct. 1984. Mosaic Photo Map Project Team
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- (8) インドネシア国南カリマンタン州ネガラ河下流域写真図作成調査
第1次作業, 第2次作業 昭和60年 1月 JICA
- (9) Report on Mosaic Photo Map Project on the Downstream Area of the
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(First and Second Years' Work) Jan. 1985 JICA
- (10) 国土地理院: 精密測地網一次基準点測量作業規程(案)
日本測量協会
- (11) Bertanan Pohon Buah-Buahan. 1974. Penerbit Yayasan Kanisius
- (12) List of Tree Species Based on Vernacular and Botanical Name in
South Kalimantan No. 8. 1983
Facultas Kehutanan. Universitas Lambung Mangkurat, Banjarmasin
- (13) 大矢雅彦編: 地形分類の手法と展開 1982, 古今書院
- (14) 渡辺光: 自然地理 朝倉地理学講座(1), 1961, 朝倉書店
- (15) インドネシア国南カリマンタン州ネガラ河上流域地図作成事業
総合報告書 昭和61年 1月 JICA
- (16) Topographic Mapping Project for Upper Stream Area of Negara River
Basin. South Kalimantan, Republic of Indonesia. General Report.
Jan. 1986. JICA



監理要員の
現地視察

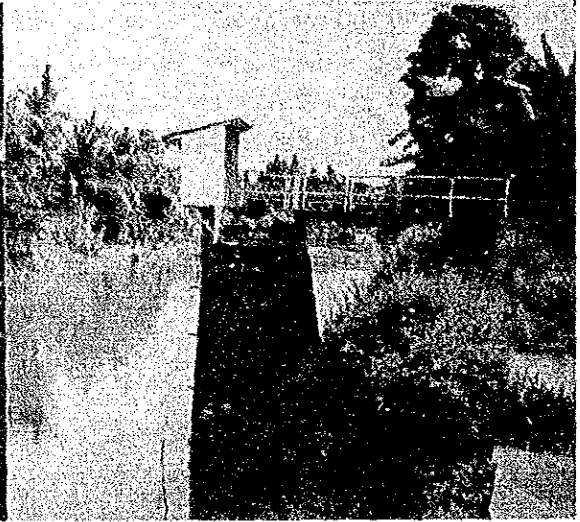


研修生による
図面の最終チェック

ALABIO付近の
湿原地



ネガラN.N.S.S観測点D-642



水位観測所 W-1



BARABAI市内の洪水
28 NOV 1984



自然堤防の景観

集落内にはバナナが植栽され、これらを突出してヤシ林がみられる。



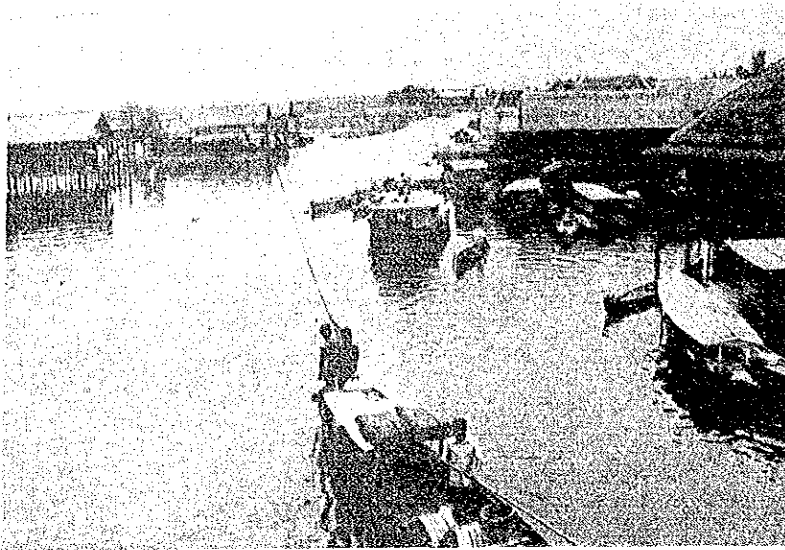
デルタ(乾期の状況)

標高のやや高い地域であり、乾期には水がないため水田は耕作されていない。



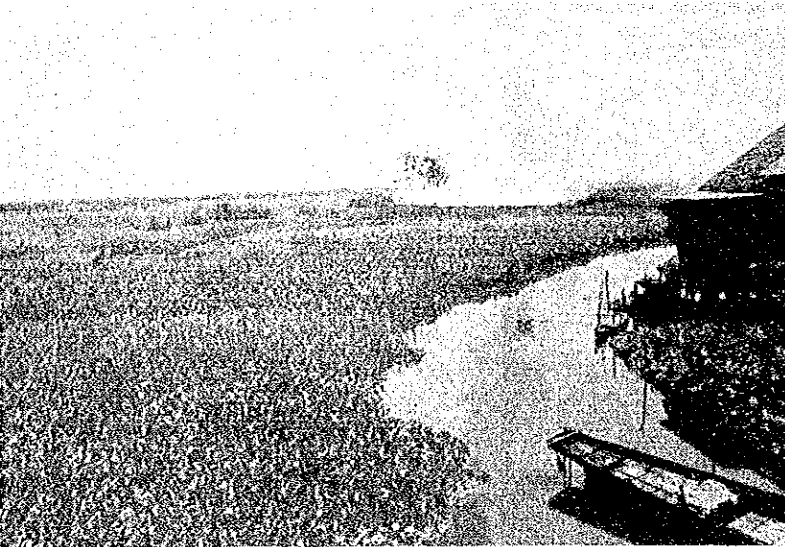
デルタ(雨期の状況)

水田は雨期に耕作されている。この地点では田植えは2・3月、稲刈りは5・6月に行われる。



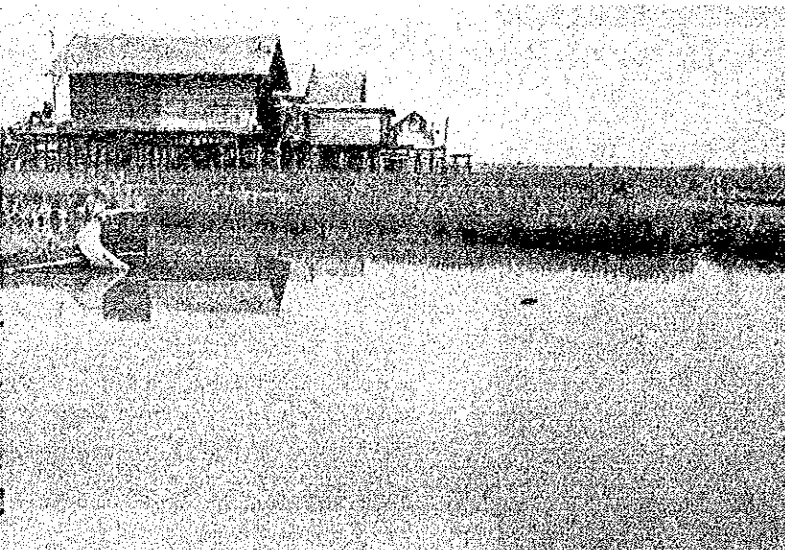
後背湿地（雨期）
の景観

湛水域が拡大する。雨
期・乾期ともに、交通
機関は船である。



後背湿地（乾期）

〈*Echinochloa crus-*
galli Beauv. 〉・〔Rampu
batu〕、〈*Phragmites*
crassipes〉・〔Parupuk〕
を主体とする草原が広がる。
所々で焼畑がみられる。



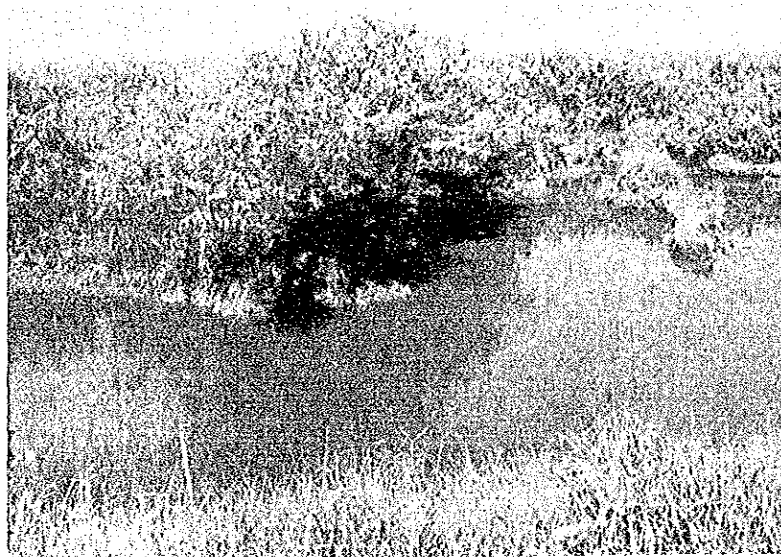
後背湿地（乾期）

雨期には水没するが、
乾期には陸域化し、水
田が耕作されている。



森林性の後背湿地

〈*Planchonella obovata* Pierre〉・〔*Kayu sepat*〕の優占する自然性の森林。周辺の草原と比較して20～100 cmの比高をもつ。



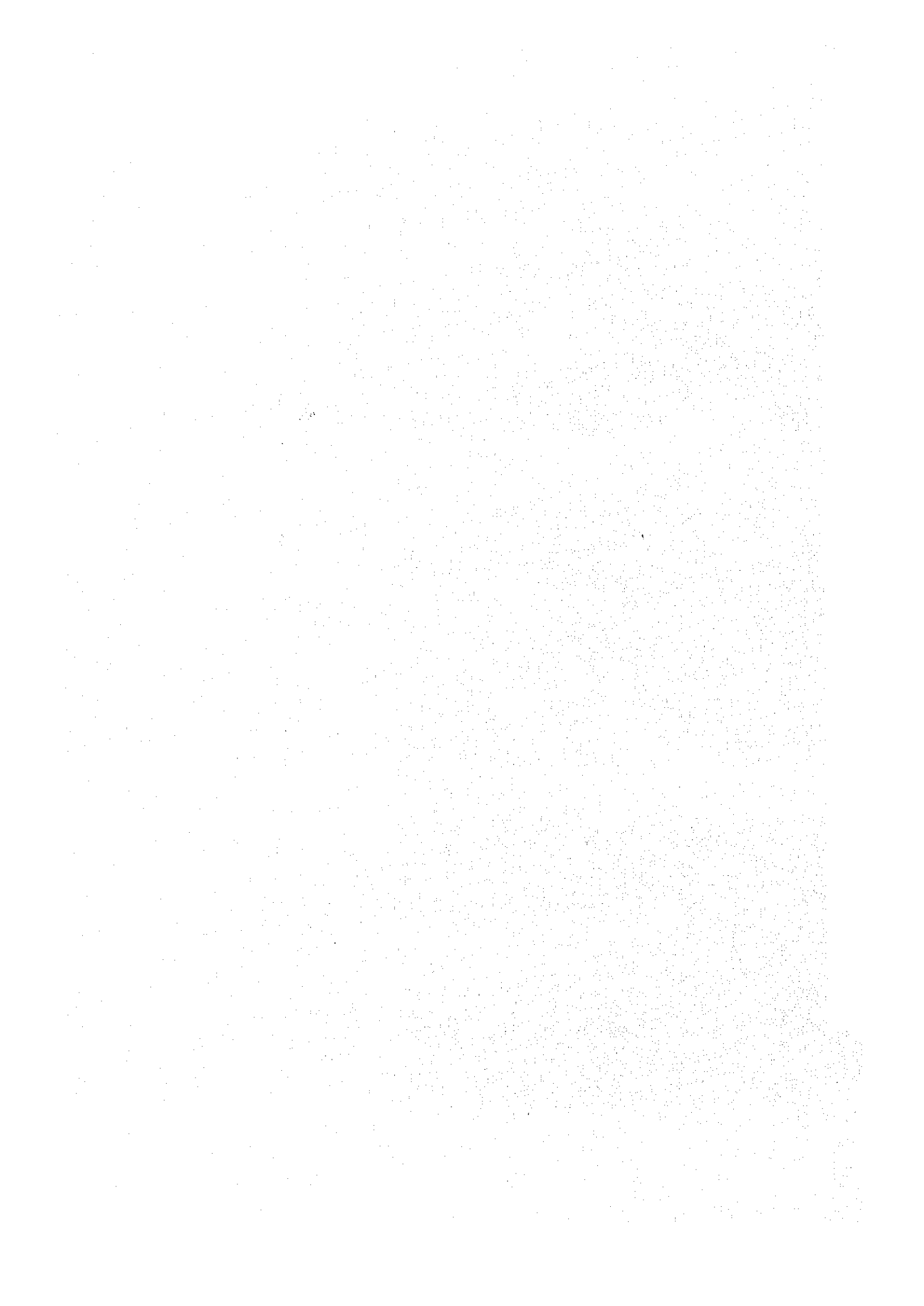
後背湿地に生育する低木林

この低木林〈*Mimosa pigra* L.〉・〔*Jepung*〕は、周辺の草原と比較して10～30 cmの比高をもつ。



後背湿地に広がる
放牧地（乾期）

乾期には水牛が放牧されるが、雨期には大部分の地域が水没する。



正 誤 表

頁	誤	正	
1	下カラ 2行目	Directorat Derektoral	Direktorat Direktorat
6	下カラ 9行目	Kalinantan	Kalimantan
7	15行目	農村水産省	農林水産省
24	ページ欄	-24-	-25-
25	ページ欄	-25-	-24-
41	10行目	南カリマンタマ州	南カリマンタン州
49	12行目	調査計算	調整計算
58	下カラ12行目	N=289, 893. 515m	E=289, 893. 515m
61	下カラ 5行目	3, 328, 819. 518 m	328, 819. 518 m
65	12行目	方向角を用い	方位角を用い
65	4行目	=3. 0X10 ⁻⁸	γ=3. 0X10 ⁻⁶
74	7行目	往復観測の比較	往復観測の差
82	6行目	Zeib	Zeiss
86	6行目	洪水泥濘	洪水氾濫
90	下カラ12行目	旧河道などと	旧河道などの
96	下カラ1行目	上位デルタ西より	上位デルタ面より
96	下カラ12行目	高 原	高茎草原
99	下カラ11行目	低 原	低茎草原
99	13行目	(squash)	(squash)
108	17行目	<Mimosa Pigral >	<Mimosa Pigra L. >
108	下カラ 9行目	(Pteridophyte)	(Pteridophyta)
111	6行目	ベースよし	ベースとし
112	下カラ5, 4 行目	ADMINISTRATIVE (KABUPATEN) BOUNDARIES (KECAMATAN)	ADMINISTRATIVE (KABUPATEN) BOUNDARIES (KECAMATAN)
121	表 下カラ 9行目	(PH 60~80)	(RH 60~80)
121	表 下カラ 3行目	(g/m ⁴)	(g/m ²)
122	表 1行目	瞬時視野	分解度
122	表下 1行目	バンド 7	バンド 5
123	下カラ 1行目	図-13.1.1	図-13.1
124	5行目	詳細は地形	詳細な地形
	7行目	図 3.2	図-13.2
	8行目	13. -1.1	13-1
126	13行目	スピード	スピード
	下カラ 9行目	図-13.3	図-9.5
133	3行目	湿地上大別	湿地に大別
	下カラ 1行目	<Mimosa Pigral >	<Mimosa Pigra L. >
		(Jepung)	(Jepung)
136	表-13.4 上カラ4 欄目	水田 (乾期)	水田 (雨期)
140	12行目	表-14.1	表-14.2
	13行目	表-14.1	表-14.2
	表-14.2 2行目	115° 15' 16" .14	115° 15' 16" .14E
	3行目	2° 47' 22" .811E	2° 47' 22" .811
143	下カラ 7行目	図-14.3	図-14.4
144, 145	の間 (仕切紙)	図-14.3	図-14.4
194	17行目	Malimantan	Kalimantan
195	上カラ 2行目	監理委員	監理委員

