SECTOR L

DATABASE

1. EXISTING DATABASE

Through the investigation to the database system in South Sumatra Province, it was found that two GIS database system (Forestry Department and BAPPEDA GIS database) and one information network system (INFORKOM MIS) existed, and can be considered to provide GIS database to JICA study.

1.1 BAPPEDA GIS Database

BAPPEDA has used GIS for the spatial planning for a long time. The system software and hardware used in BAPPEDA GIS are PC ArcInfo 3.5, ArcView3.2, Windows98 and Windows NT platforms. However, the system is not running at present because the local GIS consultant company stopped the contract with BAPPEDA. Fortunately, some GIS data are kept back up in CD-ROM, and some data kept in paper format. Therefore, JICA study team could collect the following GIS data from BAPPEDA.

1.1.1 Land Use in 1980

The land use map (scale 1:500,000) in 1980 was collected from BAPPEDA map album. JICA study team converted this paper map to digital GIS data by digitization work, and the area of each land use type was summed up through GIS analysis. The land use map and related table are shown in **Annex C4.1.1**. It shows almost 19% of whole MUSI river basin (11,605 km^2 of 59,354 km^2) was covered by natural forest in 1980.

The specification of land use data was shown on **Table L1.1.1**.

Table L1.1.1 The Data Specification of Land Use 1980

Land Use Type	Name in BAHASA Indonesia	Name in English	Compare Code with Land Use 2000
1	Kampung	Built-up Area	1
2	Perkebunan Rakyat	People Plantation Area	2
3	Tegalan	Dry Land Agriculture	3
4	Sawah	Rice Field	4
5	Kebun Campuran	Mixed Garden	5
6	Perkebunan Besar	Big Plantation Area	6
7	HTI	Forest Plantation	7
10	Hutan Lebat	Natural Forest	10
11	Belukar	Virgin Forest	1112
12	Belukar Rawa	Virgin Forest	1112
13	Rawa	Swamp	13
14	Alang-alang	Moorland	14
15	Sungai / Danau	River	15

1.1.2 Current Land Use

The land use data (scale 1:50,000) in 2000 was also collected from BAPPEDA. It was made by BPN through a BAPPEDA project. All the data was separated to 150 map sheets by 1:50,000 index map. JICA study team fixed diversity errors from features and projection, appended all the data together and regenerated it to GIS database which can be analysis by GIS tool. Also, for comparing with land use in 1980, the land use types were also reclassified by JICA study team. Completed land use 2000 map and associated table of each land use type are shown in **Annex C4.2.2 of Supporting Report Sector C**. The data specification table is shown in **Annex L1.1.1**.

1.1.3 Current Land Use Planning

Based on the law number 24, 1992 and province regulation number 5, 1994. The spatial plan of South SUMATERA Province was established in 1992 and then revised in 1999. The expired time of this plan is 15 years from 1999 to 2014. However, considering the current economic situation of Indonesia, this spatial plan can be fully considered to revise again without big update. Therefore, it is possible to use this spatial plan as in 2020. The data specification of land use planning is shown in **Table L1.1.2**.

Table L1.1.2 The Data Specification of Land Use Planning

Land Use Planning Code	Re-classed Code	Name in BAHASA	Name in English
1	1	Hutan Suaka Alam	Wildlife Preserve Forest
2	2	Hutan Lindung	Preserved Forest
3	3	Hutan Produksi Terbatas	Limited Production Forest
4	4	Hutan Produksi Tetap	Remained Production Forest
5	5	Hutan Produksi yang Dapat Dikonversikan	Conversion Production Forest
6	6	Kawasan Perkebunan	Estate Area
7	7	Kawasan Transmigrasi	Transmigration Area
8	8	Kawasan Tanaman Pangan	Food Plantation Area
9	9	Pengembangan Irigasi	Irrigation Development
10	10	Areal Penggunaan Lain	Other Use Area
Other	999	Masih Tumpangsusun diantara 10 rencana di atas	Not Yet Fixed Planning Area

1.2 Forest GIS Database

It is a GIS group in forestry department to manage a GIS database, and provide GIS services to forest management group. Even the version of GIS database and system is a little old (PC ArcInfo 3.5 and Arcview3.2), the system is running smoothly and the forest GIS database is kept to be updated year by year.

1.2.1 GIS Capacity Building in Forest Department

The GIS capacity including man power, software, and hardware in Forest Department is shown in **Table L1.2.1**.

Table L1.2.1 Quantities of GIS Engineers, GIS Software and Hardware

Engineer	Quantities	Software	Unit	Hardware	Unit
GIS Operator	3	Arcview 3.2	3	Computer	4
Digitizer Operator	1	PC ArcInfo 3.5.1	1	Digitizer	1
Computer Operator	5	ArcInfo 7.2.1	1	Plotter	1
Remote Sensing Operator	2	ER Mapper	1	Printer	2
Database Management	1	Idrisi	1	Scanner	1
Programmer	1			Laptop	1

1.2.2 GIS Data List in Forest Department

The data collected from forest department is shown in **Table L1.2.2**.

The data specification is shown in **Table L1.2.3** to **Table L1.2.5**.

Table L1.2.2 The Data List Collected from Forestry Department (1:250,000 Scale Data)

Layer Name in BAHASA Indonesia	Layer Name in ENGLISH	Data Specification
Sungai	River	No Attribute
Jalan	Road	No Attribute
Anotasi	Annotation	No Attribute
Kawasan Hutan	Current forest in 2002	Table L1.2.3
Penutupan Lahan/Vegetasi	Land Cover/Vegetation 1998	Table L1.2.4
HPH	Forest concession of Natural Forest, legal logging area	Table L1.2.5
HTI	Industry Forest Plantation	Code, Name
Sungai Polygon	Water body (stream)	No Attribute
Trans	Transmigration Area	Code, Name of Location, Number
Batas Kabupaten	Regional boundary	Type of Border
Batas Kecamatan	District boundary	District Name
Batas Propinsi	Provincial boundary	No Attribute
Kota/Desa/Pemukiman	Town, village, living area	No Attribute
TGHK	Forest Land Use Planning in 1984	Code and Name
RTRWP	Forest Land Use Planning in 1994	Code and Name

Table L1.2.3 The Data Specification of Current Forest (1:250,000 Scale Data)

Forest Code	Forest Name in BAHASA	Forest Name in English
1001	HL	Protection Forest
1002	HSA	Natural Protection Forest
1003	HP	Production Forest
1004	HPT	Limited Production Forest
1005	HPK	Conversion Forest
1007	APL	Other Land
5001	DANAU	Lake

Table L1.2.4 The Data Specification of Current Land Cover (1:250,000 Scale Data)

Code	Name in BAHASA	Name in English
100	APL	Other Land
200	HAS and HL	Protection Forest
400	HP, HPT, HPK	Production Forest
5001	DANAU	Lake

Table L1.2.5 The Data Specification of Forest Logging (1:250,000 Scale Data)

Company Number	Logging Code	Logging Company Name	Logging Status
0	0	KOPERASI WANAKARYA LESTARI (ex	No Status
0	0	PT. INHUTANI V EKS WH	No Status
3	0	PT. INHUTANI EKS WH	No Status
0	0	PT. INHUTANI EKS	No Status
0	0	PT. INHUTANI EKS KMPI SM	No Status
4	0	PT. INHUTANI EKS SYLVA	No Status
0	0	PT. INHUTANI V	No Status
6	0	PT. INHUTANI V	No Status
0	0	PT. INHUTANI V	No Status
0	0	PT. INHUTANI V (Eks SST)	No Status
27	0	PT. INHUTANI V EKS KMPI	No Status
27	0	PT. INHUTANI V EKS RJB	No Status
28	110702400	PT. INHUTANI V EKS SBJ	Expire
30	110701600	PT. INHUTANI V EKSTUAHMEGOW	Expire
10	110701600	PT. INHUTANI V EKSTUAHMEGOW	Expire
11	110700600	PT. KMPI (DH: BUMI RAYA)	Expire
12	0	PT. PPUJ	No Status
0	11070	PT. SRIBUNIAN	No Status
13	0	PT. WAI HIJAU HUTANI	No Status
14	110700202	PT.DAYA PENCA	Expire
35	110701101	PT.EKS PENCADANGAN SST	Active
37	110701200	PT.FAMILI JAYA	Active
20	110701300	PT.FATMA BERSAUDARA	Expire
15	110701801	PT.INHUTANI EKS PWL	Expire
15	110701101	PT.INHUTANI V EKS KMPI	Active
39	110701802	PT.INHUTANI V EKS PWL	Expire
0	110702300	PT.SBA WOOD INDUSTRIES	Active
0	110700703	PT.SENTOSA JAYA	Active
0	110700702	PT.SENTOSA JAYA	Active
0	110700701	PT.SENTOSA JAYA	Active
0	110700704	PT.SENTOSA JAYA	Active
18	110702100	PT.SINAR BELANTI JAYA LTD	Expire
0	110700400	PT.SRIBUNIAN TRADING CO	Active

1.3 Management Information System (MIS)

By the investigation to Information and Communication Department (KANTOR INFORKOM) of South Sumatra Province, it was found that a network information system is establishing. The system name is Regional Management Information System (MIS). Currently, the central system has already established in KANTOR INFORKOM and linked to Internet. As the same time, a government website has also been set up for introducing profile of the province, major production, tourism and etc. Along with the construction plan, a government Intranet will be established in the future. The system configuration was shown in **Annex L1.2.1**. In the future, all state government offices will be linked by this Intranet. Then, the GIS database established in JICA study can be shared with other government agencies through this network system.

2. MUSI RIVER BASIN GIS DATABASE ESTABLISHMENT

According with above data collection, the GIS database specification is designed as follows.

2.1 Specification of 1:250,000 GIS Database

The 1:250,000 scale GIS data was collected from Forest Department and BAPPEDA and designed into GIS database as follows. The **Table L2.1.1** shows the specification of 1:250,000 scale GIS Database.

Table L2.1.1 The Specification of 1:250,000 GIS Database

Coverage	Feature Entities	Description	Attributers	Feature Class
Index50k	Polygon	1:50,000 Map Index	Map No.	Poly
Index250k	Polygon	1:250,000 Map Index	Map No.	Poly
Admin	Admin-Line	International, Province, Region and District	Board Type	Arc
	Admin-Poly			Poly
	Admin District	District Information	Code, Name, Population, Household in 1990 and	Region
	Admin Region	Region Information	Code, Name	Region
Road	Road-Line			Arc
Waterbody	River-Poly	River, Stream and Island	Type	Poly
River	River-Line			Arc
Villages	Living Area-			Poly
Catchment	Basin-Poly	Sub-Basin Information	Basin Code, Basin Name	Poly
Annotation	Text-Annotation	Important Position Name	Level No., Symbol No.	Annotation
Landuse80	Land-Poly	Land Use Information in 1980	Type, Name	Poly
Landuse00	Land-Poly	Land Use Information in 2000	Type, Name	Poly
Luplan00	Land-Poly	Current Special Planning	Type, Name	Poly
F_Luplan0	Land-Poly	Current Forest Planning	Type, Name	Poly
F_cover00	Land-Poly	Current Forest Land Use	Type, Name	Poly
F_plantatio	Land-Poly	Forest Plantation Area	Type, Name	Poly
F_logging	Land-Poly	Regal Forest Logging Area	Type, Name	Poly

2.2 Specification of 1: 50,000 GIS Database

For 1:50,000 Topographic Data, JICA Study Team purchased the data from BAKOSURTANAL. Totally 150 sheets covered whole South Sumatra Province. The data contents are shown in **Table L2.2.1.** The data specification of 1:50,000 GIS database are shown in **Table L2.2.2.**

Table L2.2.1 The Layer List of 1: 50,000 GIS Database

NO	TEMA	ENGLISH	TYPE	KODE	NLP	NAME OF COVERAG
1	Bangunan	Building	Point	B		B1209213
2	Utilitas	Utility	Line	U		U1209213
3	Bangunan Gedung	Built-up Area	Polygon	D		D1209213
4	Pemukiman	Living Area	Polygon	S		S1209213
5	Komunikasi	Communication	Point	Z		Z1209213
6	Komunikasi	Communication	Line	K		K1209213
7	Komunikasi	Communication	Polygon	F		F1209213
8	Titik Kontrol	Control Point	Point	E		E1209213
9	Kontur Titik	Elevation Point	Point	T	1209-213	T1209213
10	Kontur	Contour	Line	C		C1209213
11	Administrasi	Administrative	Line	X		X1209213
12	Adminstrasi	Administrative	Polygon	A		A1209213
13	Garis Pantai	Coast Line	Line	L		L1209213
14	Hidrologi	Hydrology	Line	H		H1209213
15	Hidrologi	Hydrology	Polygon	P		P1209213
16	Penutupan Lahan	Closed Area	Polygon	G		G1209213
17	Toponimi	Important Point	Point	N		N1209213

Table L2.2.2 The Specification of 1: 50,000 GIS Database

NO	TEMA/LAYER	ENGLISH	CODE NO
1	Struktur/Bangunan Penting/Umum unsure titik (B)	Structure/Important Building/general, point element (B)	
	Gedung/bangunan/rumah terpencar	Building/house	111000
	Stasiun	Station	244000
	Jembatan jalan	Bridge of road	241100
	Jembatan kereta api	Bridge of railway	241200
	Jembatan titian	Temporary bridge	241300
	Kantor polisi	Police Office	111110
	Masjid	Mosque	112110
	Gereja	Church	112120
	Kelenteng	Chinese temple	112140
	Pura	Temple	112130
	Kantor pemerintah (walikota, kabupaten, kecamatan, desa)	Government office	113000
	Komersial dan industri (pasar, bank, toko, restoran, koperasi)	Commercial and industry (market, bank, shop, restaurant, cooperation)	114000
	Sosial dan kesehatan (rumah sakit, puskesmas, kantor pos, kantor telepon)	Social and healthy (hospital, post office. telephone office)	115000
	Pendidikan (umum, agama, militer)	Education	116000
	Rekreasi (monumen, museum, cinema)	Recreation	117000
	Pembuangan amunisi		118100
	Daerah terlarang	Restricted area	118200

(Continuing)

Table L2.2.2 The Specification of 1: 50,000 GIS Database (Continued)

NO	TEMA/LAYER	ENGLISH	CODE NO
1	Struktur/Bangunan Penting/Umum unsure titik (B) (Continued)	Structure/Important Building/general, point element (B)	
	Daerah latihan	Military area	118300
	Menara	Monument	124100
	Tambang	Mining	123100
	Sumur bahan bakar	Recreation	232000
	PLTA	Hydro electric power	123500
	PLTU	Vapour electric power	123600
	PLTD	Diesel electric power	123700
	PLTG	Gas electric power	123800
	Tangki air	Water tank	124200
	Tangki bahan bakar	Fuel tank	124300
	Sumber gas alam	Natural gas resources	123300
	Sumber air panas	Hot water resources	123400
	Bendungan	Dam	650000
	Lampu navigasi laut	Sea navigation lamp	124400
	Lampu navigasi udara	Air navigation lamp	124500
	Makam Islam	Moslem cemetery	112210
	Makam Kristen	Christian cemetery	112220
	Makam Umum	Public cemetery	112200
	Makam Hindu	Hindu cemetery	112230
	Makam Budha	Buddhist cemetery	112240
	Makam Pahlawan	Hero cemetery	112250
2	Utiliti – linier (U)	Utility-linear (U)	
	Kawat listrik tegangan tinggi	High voltage electricity line	710000
	Kabel darat	Line cable	711000
	Kabel laut	Sea cable	712000
	Kawat telepon/telegram	Telephone line	720000
	Pipa bahan baker	Fuel pipeline	730000
	Pipa gas	Gas pipeline	740000
3	Bangunan Gedung (D)	Built-up Area (D)	Sesuai dengan nilai ketinggian titik
4	Area Pemukiman/Bangunan – area (S)	Settlement/Building – area (S)	
	Daerah Pemukiman dalam batas-batas ibukota negara	Settlement zone in state border level	121100
	Daerah Pemukiman dalam batas-batas ibukota propinsi	Settlement zone in province border level	121200
	Daerah Pemukiman dalam batas-batas ibukota kabupaten	Settlement zone in district border level	121300
	Pemukiman lain	Others settlement	121500
5	Unsur Komunikasi titik (Z)		
	Tempat berlabuh	Harbour	221100
	Larangan berlabuh	Restricted harbour	211200

(Continuing)

Table L2.2.2 The Specification of 1: 50,000 GIS Database (Continued)

NO	TEMA/LAYER	ENGLISH	CODE NO
6	Unsur Komunikasi Linier (K)		
	Jalan Arteri satu jalur	One Way Arterian Road	221110
	Jalan Arteri dua jalur	Two Way Arterian Road	221120
	Jalan Kolektor	Colector road	221200
	Jalan yang sedang dibangun	Under construction road	221400
	Jalan Setapak	Foot path	221600
	Jalan lain	Others road	221500
	Jalan kereta api tunggal	Single railway	222200
	Jalan lori	Small railway	222300
	Jalan local	Local road	221300
	Sistem pemisahan lalu lintas	Traffic separate system	241000
	Batas sector	Border of sector	242000
7	Unsur Komunikasi areal (F)	Element of Communication area (F)	
	Lapangan terbang internasional	International Airport	231000
	Lapangan terbang domestik	Domestic Airport	232000
	Lapangan terbang perintis	Pioneer Airport	233000
	Lapangan terbang militer	Military Airport	234000
	Dermaga Laut	Port	249000
8	Titik Tinggi (E)	Spot height (E)	Sesuai dengan nilai ketinggian titik
9	Unsur titik kontrol (T)		
	Titik tinggi	Spot height point	421000
	Titik Triangulasi primer	Primary triangulation point	422100
	Titik triangulasi sekunder	Secondary triangulation point	422200
	Titik triangulasi tersier	Tertiary triangulation point	422300
	Titik triangulasi kuarter	Quartery triangulation point	422400
	Titik Astronomi	Astronomical point	423000
	Titik Doppler	Doppler point	424000
10	Garis Kontur (C)	Contour line (C)	Sesuai dengan nilai kontur
11	Administrasi (X)	Administrative (X)	

(Continuing)

Table L2.2.2 The Specification of 1: 50,000 GIS Database (Continued)

NO	TEMA/LAYER	ENGLISH	CODE NO
12	Administrasi – Linier (A)	Administrative – Linear (A)	
	Batas negara	State boundaries	510000
	Batas negara (tidak terlihat)	State boundaries	510001
	Garis cakupan 12 mil	12 miles boundaries	511000
	Batas propinsi	Province boundaries	520000
	Batas propinsi (tidak terlihat)	Province boundaries	520001
	Batas kabupaten/kodya	Residence boundaries	530000
	Batas kabupaten/kodya (tidak telihat)	Residence boundaries	530001
	Batas kecamatan	District boundaries	540000
	Batas kecamatan (tidak telihat)	District boundaries	540001
	Batas desa	Village boundaries	550000
	Batas desa (tidak telihat)	Village boundaries	540001
13	Garis Pantai – areal (L)	Coast Line- area (L)	
	Garis pantai	Coast Line	631100
14	Hidrologi – linier (H)	Hydrology – linear (H)	
	Sungai	River	610000
	Sungai musiman	Season River	613000
	Terusan/saluran air	Cannals	611100
15	Hydrology – area (P)	Hidrologi – aereal (P)	
	Danau	Lake	620000
	Sungai luas/lebar	Big River	610100
	Sungai luas musiman	Season big river	613010
	Rawa	Swamp	634100
	Empang	Pond	634200
	Tambak	Embankment	634300
	Penggaraman	Salt land	634400
16	Penutupan Lahan	Closed Area	
17	Toponimi (N)	Toponimy (N)	
	Nama-nama unsur perairan laut	Name of sea element	
	Samudera	Ocean	911000
	Laut	Sea	911200
	Teluk	Bay	911300
	Selat	Srait	91400
	Lainnya	Others	911500
	Nama-nama unsure perairan darat		
	Sungai danau	River and lake	912000
	Nama-nama unsure rupabumi		
	Pegunungan, gunung, pulau, bukit, tanjung, kepulauan, lembah	Mountain, island etc	921000
	Lainnya	Others	922000
	Nama-nama unsure pemukiman	Name of settlement element	
	Ibukota negara	State capital	931000
	Ibukota propinsi	Province capital	932000
	Ibukota kabupaten	Residence capital	933000
	Ibukota kecamatan	District capital	934000
	Lainnya	Others	935000
	Nama-nama Zona Administrasi	Name of administrative zone	

(Continuing)

Table L2.2.2 The Specification of 1: 50,000 GIS Database (Continued)

NO	TEMA/LAYER	ENGLISH	CODE NO
17	Toponimi (N) (Continued)	Toponimy (N)	
	Propinsi	Province	942000
	Kabupaten/kodya	Residence	943000
	Kecamatan	District	944000
	Lainnya	Others	945000
	Nama unsur lain	Name of others element	951000

2.3 The Coordinate System of GIS Database

The coordinate system used in GIS database was designed as UTM (BESSEL spheroid, and DJAKARTA datum) that was shown in **Table L2.3.1.** It is the same coordinate system that used in the 1:50,000 scale topographic map. The merits of the UTM coordinate system are as follow.

(1) One UTM zone 48 (extended from East Longitude 102 to 108 degrees) can cover whole South Sumatra Province that extended from East Longitude 102 to 105 degrees.

(2) The unit of UTM coordinate system is meter, so it is easy counted by any GIS analysis.

(3) It is easy to overlay with other GIS data sources because it is the standard coordinate system used in BAKOSURTANAL.

Table L2.3.1 The Coordinate System of GIS Database

Co-ordinate System	UTM 48 Zone
Map Projection	Transverse Mercator
Ellipsoid (Spheroid)	BESSEL
Datum	BAT (DJAKARTA)
Units	Meter

2.4 Image of GIS Database Structure

The files and folders construction of GIS database was designed as **Figure L2.4.1.**

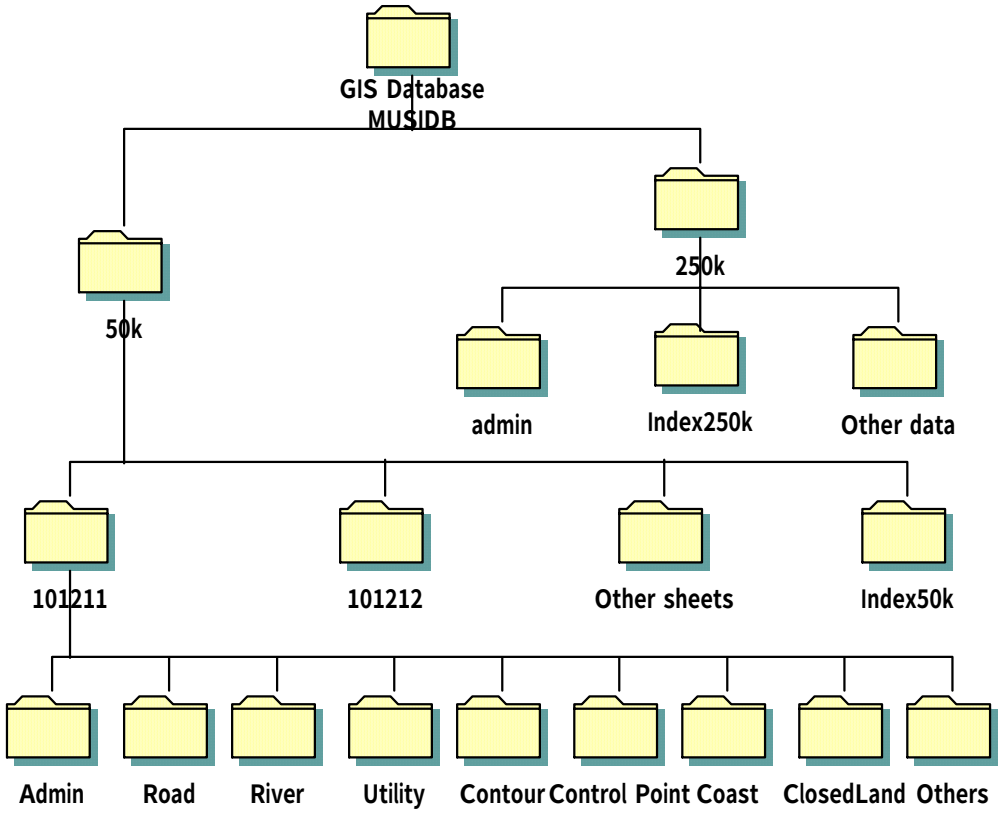

Figure L2.4.1 Image of GIS Database Construction