SECTOR C

LAND USE AND WATERSHED MANAGEMENT

1. THE PROCESSES OF LAND USE PLANNING

The watershed management includes water use management, flood control management, water environment management, and so on. All of the watershed management is supported by many basic factors, for example, society environment, management organizations, laws and regulations, and efficient land use planning tools. In this sector report, we will concentrate the land use planning tools. It includes what is the land use planning tools, how to use it in MUSI river basin management, and what results can be gotten through using those tools.

As it was known, an optimum regional land use planning does not only act on the regional spatial plan, but also plays an important role in the river and water resource management in a long run. Therefore, the land use planning is the basic process in river basin management. To fully use the result of land use planning in MUSI river basin management, the methodology of land use planning should be given first, then the land use changes and land use planning should be verified in this study. The road map of the land use planning is shown in **Annex C1.0.1**.

1.1 Land Form and Land System Classification

The first work of land use planning is to classify the land into suitable landforms and land systems by the characters of the land. The factors used in this work include both natural and social conditions, sort of Elevation, Slope, Soil, Geology, and Administrative boundary. Aerial photos, Satellite Images, and The Field Survey are used to check the classification result.

Figure C1.1.1 shows the flowchart of land system classifications by using GIS analysis tools. There are three steps in this process.

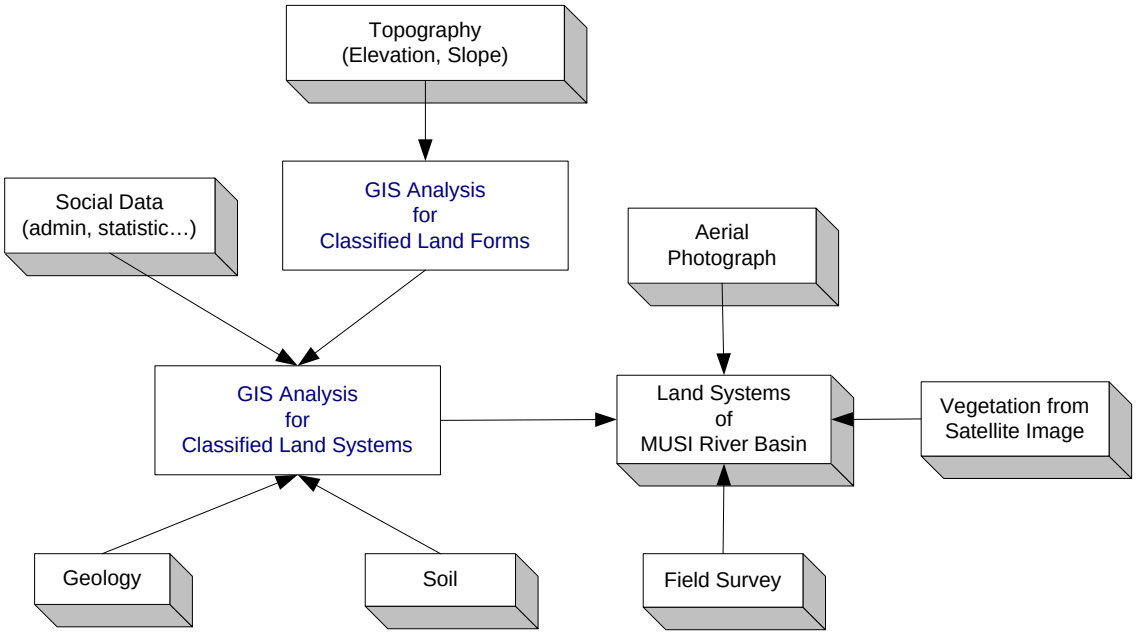

Figure C1.1.1 Flowchart of Land Form Classification

1.1.1 Land Form Classification

In this step, the landforms are classified by using Topographic data. It was realized by GIS 3D analysis with DEM and Slope data. In MUSI river basin, there are seven major landforms are classified in this process. Mountains, Steep Hills, Hillocky Land, Undulating and Rolling Plains, Inter-mountain Plains, Inland Riverine Plains, and Flood Plains and Swamps. The result of the Land Form Classification is shown in **Figure C1.1.2**.

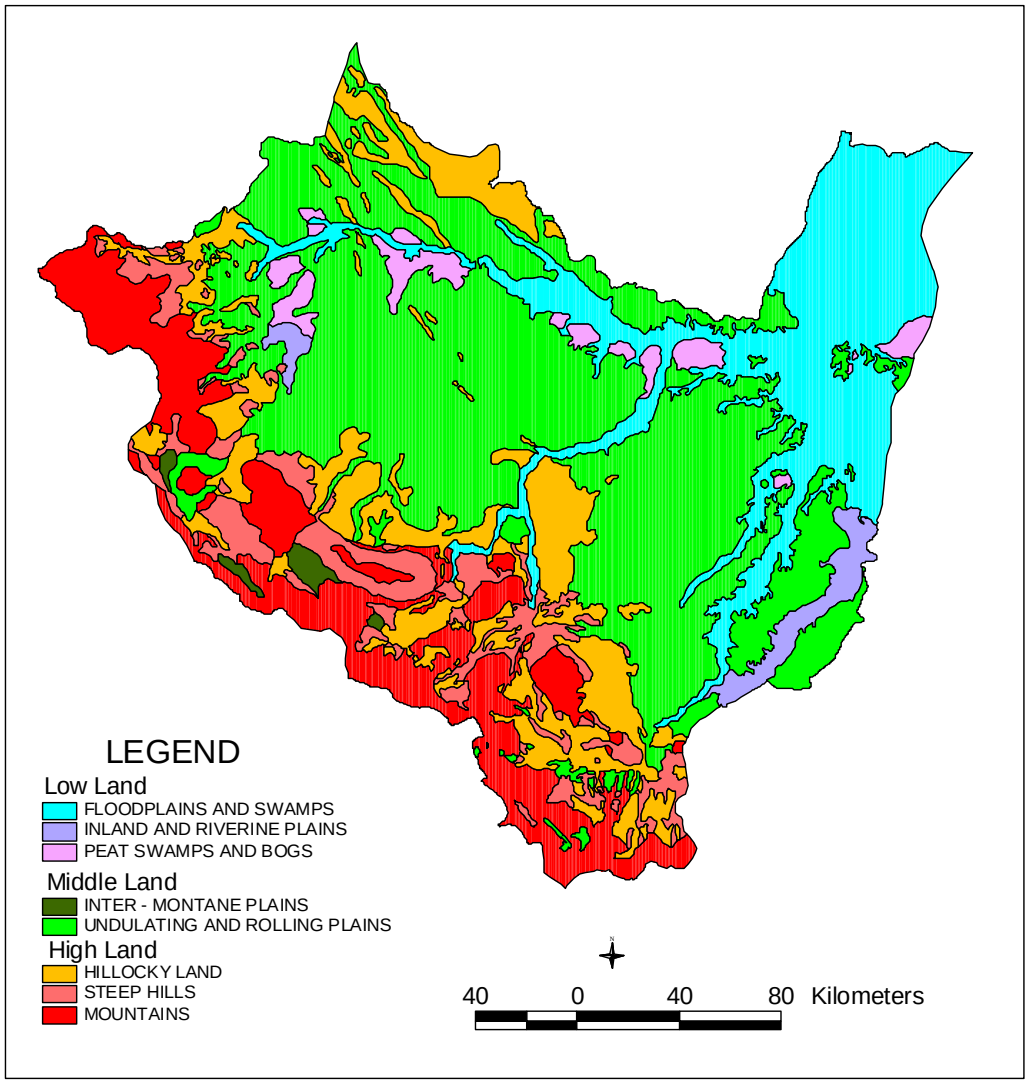

Figure C1.1.2 Land Form Classification Map

1.1.2 Land System Classification

The second step of this process is the land system classification. The land systems classification is detail classification on Land Forms by using some social and natural

data. For example, administrative boundary with economy and population data, soil and geology data, and so on. The GIS Overly tools will be also used in this process.

1.1.3 Land System Verification

Following the second step, the land systems can be verified by using aerial photos, satellite images, and some field survey works in the final step. The land system classification of MUSI river basin is shown in **Figure C1.1.3**. There are totally 42 land systems in the study area.

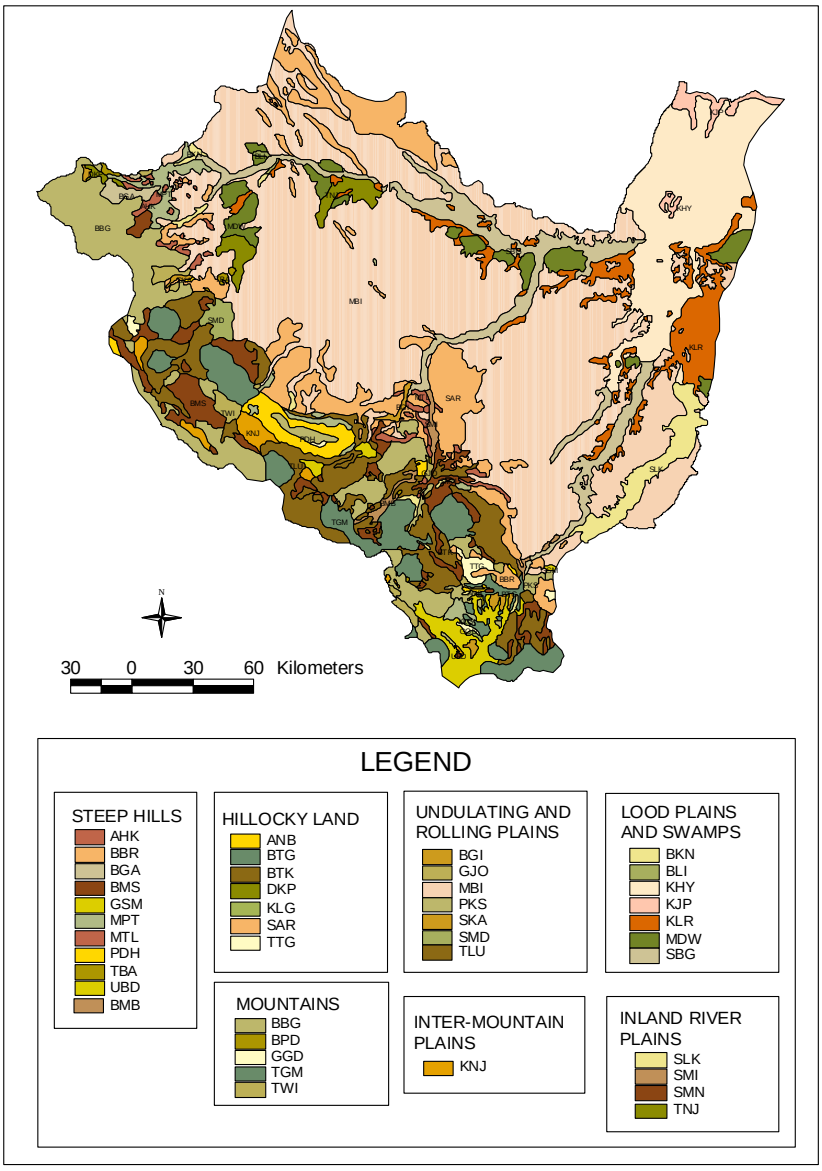

Figure C1.1.3 Land System Classification Map

1.2 Land Resource Evaluation

The second work of land use planning is to evaluate the land resources and find the suitable land for target usage. The basic factors used in this work include topography, climate, flooding area, soil conditions and protected area.

Figure C1.2.1 shows the flowchart of land resource evaluation by using GIS analysis tools. There are two land evaluation steps in this process.

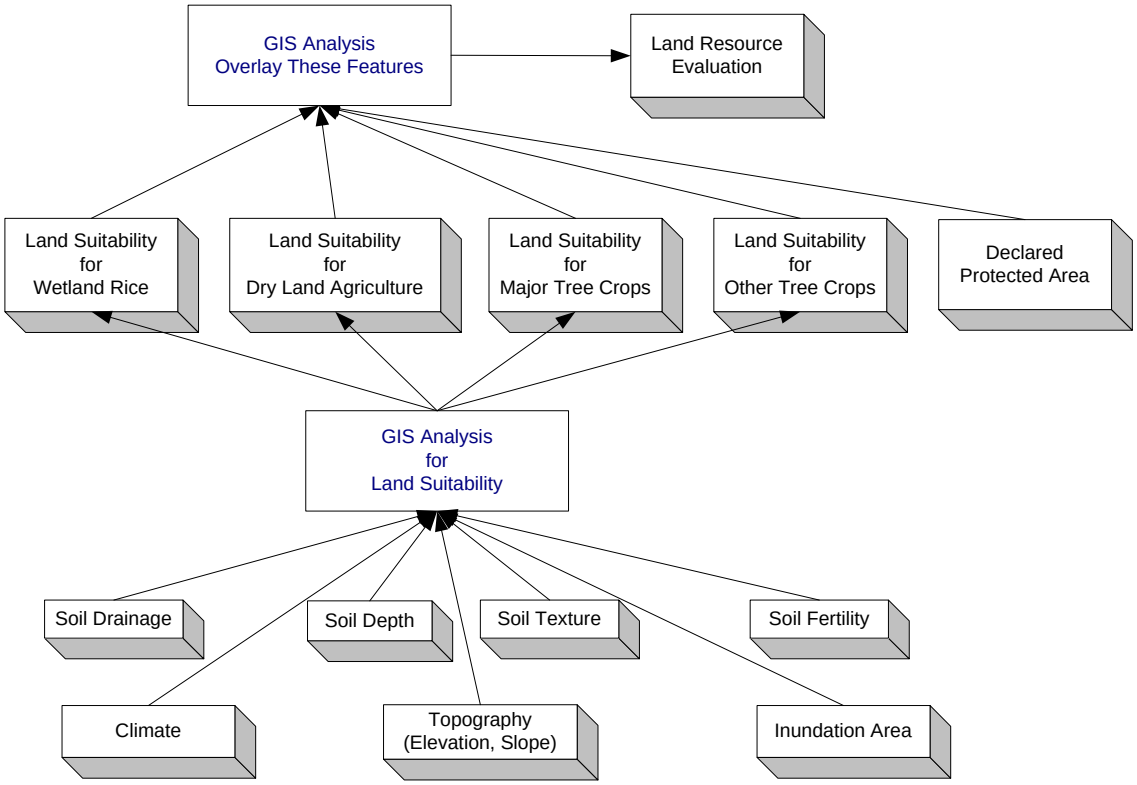

Figure C1.2.1 The Flowchart of Land Resource Evaluation

1.2.1 Land Suitability

In this step, the four targets of land evaluation are set up. The land suitability for wetland rice; the land suitability for dry land agriculture; the land suitability for major tree crops; and the land suitability for other tree crops. The topography data, rainfall data, inundation area data, and other soil condition data were used in land suitability process through GIS analysis tools. As the result, each land was evaluated by above four targets.

1.2.2 Land Resource Evaluation

The second step of this process is the land resource evaluation by integrated the four suitability results and the land characters that declared protection area. The GIS Overly tools are useful in this process. A result of the land resource evaluation in the study area is shown in **Annex C1.2.1**.

1.3 Land Use Changes

However, even the land resources were evaluated above, but the land use does not always follow the evaluation result because of many social, historical, and artificial reasons. Therefore, the fact of land use in both of current and past will be checked in this step, so that the changes of land use during 20 years can be made clear.

1.4 Land Use Planning

In this step, it will concentrate to check the land use planning by combining land resource evaluation results, current land use and land use changes during 20 years to see what have happened in the past and what will be happening in the future. How many of those changes were influenced by old and current land use planning? Do those changes toward to correct direction?

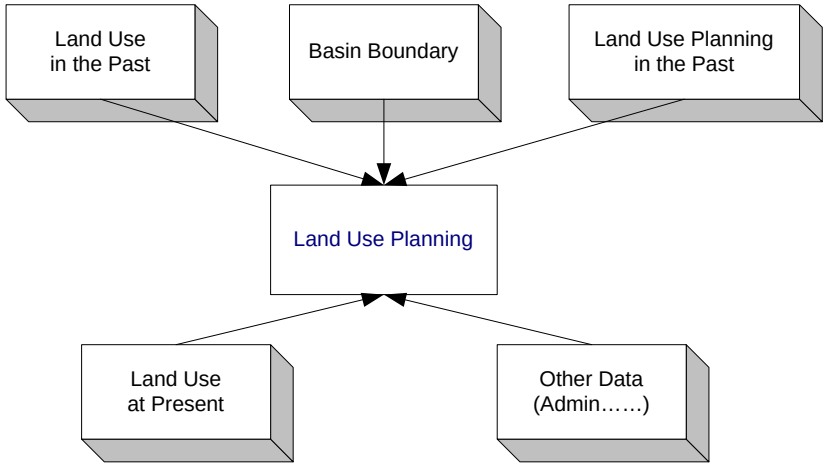

Figure C1.4.1 Flowchart of Land Use Planning

2. LAND FORM AND LAND SYSTEM

The land system classification for MUSI river basin was executed through the Regional Physical Planning Program for Transmigration (RePPProT) in 1976. Then, European Communities updated it through MUSI River Basin Study in 1989. According with above two studies, the land of MUSI river basin is grouped into seven major landforms. Each landform consists of several land systems. The land systems are classified through GIS analysis with Geology, Topography, Soil, and Vegetation from Satellite Images, Aerial Photograph Interpretation, and Reconnaissance Field Surveys. Totally forty-two land systems have been separated in the study area. The maps of landforms and land systems are shown in **Annex C2.1.1** and **Annex C2.1.2**.

2.1 Mountains

The Mountains landform is almost continuous along the watershed of the MUSI River in the west and southwest forming part of the Barisan Range. Five land systems are separated. They are Bukit Balang (BBG), Bukit Pandan (BPD), Telawi (TWI), Gunung Gadang (GGD) and Tanggamus (TGM).

Table C2.1.1 Land Systems of Mountain Land Form

Land Systems	Features
Bukit Balang (BBG)	Irregular mountain ridges, generally about 1500m above sea level (ASL), but reaching a maximum of 2817m at mountain Patah.
Bukit Pandan (BPD)	Low mountains at heights up to about 800m ASL with an amplitude of about 500m. Slopes are steep, crests are irregular, the area is strongly dissected by deeply incised streams.
Telawi (TWI)	Mountain ridges reaching up to 1316m ASL on Pg. Peraduanlumut at the southwestern catchment's boundary.
Gunung Gadang (GGD)	Mountain ridges at altitudes up to 800m ASL north of Danau Ranau and up to 1736m on Bt. Besar at northwest of Muarapinang.
Tanggamus (TGM)	Young strato-volcanoes with many peaks in excess of 1550m ASL and reaching over 3000m on Gunung Dempo.

2.2 Steep Hills

The Steep Hills are extensive in the west and southwest of MUSI river basin. Eleven land systems are separated. They are Air Hitam Kanan (AHK), Maput (MPT), Mantalat (MTL), Pendreh (PDH), Ulu Bandar (UBD), Batang Anai (BGA), Bukit Masung (BMS), Bukit Barangan (BBR), Batu Ajan (BTA), Gunung Samang (GSM), and Tambera (TBA).

Table C2.2.1 Land Systems of Steep Hill Land Form

Land Systems	Features
Air Hitam Kanan (AHK)	Steep hills and ridges at the junction of Barisan Range. Heights rarely exceed 500m ASL and the relief amplitude is about 250m.
Maput (MPT)	Steep hills lacking orientation, but with strong dissection, below 500m ASL and have amplitudes of about 200m.
Mantalat (MTL)	Linear ridges with steep scarp, dip slopes and moderate to strong dissection, normally below 300m ASL with amplitudes of relief of about 100m.
Pendreh (PDH)	Between Bungamas and Muarapinang, occurs on a broard mountain range extending from about 100m to over 1500m ASL.
Ulu Bandar (UBD)	Lower-middle slopes of old volcanoes.
Batang Anai (BGA)	The western edge of the Barisan Range, steep hills, foothills between 200 and 500m ASL with an amplitude of about 250m.
Bukit Masung (BMS)	Occurs on he foothills to major mountain masses, in general the amplitude of relief is less than 500m.
Bukit Barangan (BBR)	Occurs on steep hills between 100 to 300m ASL, but reaches 500 m in one small area northwest of Lubuk Linggau.
Batu Ajan (BTA)	Volcanic cones, from 1000 to 2100m ASL.
Gunung Samang (GSM)	Steep rounded hills between 100 and 200m ASL.
Tambera (TBA)	Steep hills occurring in isolation, standing above the general level of surrounding land.

2.3 Hillocky Land

Seven land systems are separated on Hillocky Land. They are Aeknabontair (ANB), Batuapung (BTG), Barongtongkok (BTK), Dolokparlajanan (DKP), Sungai Aur (SAR), Tebingtinggi (TTG), and Kalung (KLG).

Table C2.3.1 Land Systems of Hillocky Land Form

Land Systems	Features
Aeknabontair (ANB)	Hillocks of marble and limestone generally below 200m ASL, amplitude of relief is between 50 to 100m.
Batuapung (BTG)	Hillocks land generally above 300m ASL, amplitude of relief is between 100 to 200m.
Barongtongkok (BTK)	Represents the lower-middle slopes of the volcanoes included in the Tannamus (TGM) land system.
Dolokparlajanan (DKP)	Hillocky land with relief of about 50m at heights below 300m.
Sungai Aur (SAR)	Low hillocky land below 200m, amplitude of relief is less than 50m.
Tebingtinggi (TTG)	Hillocky land below 200m ASL at south of Muaradua and at about 1000m north of Curup, amplitude of relief is less than 100m.
Kalung (KLG)	Steep hills derived from limestone and marble.

2.4 Undulating and Rolling Plains

Undulating and Rolling Plains are extensive between the Barisan Range and the east coast. Seven land systems are described. Gajo(GJO), Talamau(TLU), Bukit Tinggi(BGI), Muara Beliti(MBI), Sungai Medang(SMD), Sukaraja(SKA), and Pakasi(PKS).

Table C2.4.1 Land Systems of Undulating and Rolling Plain Land Form

Land Systems	Features
Gajo(GJO)	Volcanic fans and undulating lower volcanic slopes.
Talamau(TLU)	
Bukit Tinggi(BGI)	Flat to undulating plains
Muara Beliti(MBI)	Undulating to rolling plains
Sungai Medang(SMD)	
Sukaraja(SKA)	
Pakasi(PKS)	Dissected plains

2.5 Inter-mountain Plains

Isolated Inter-mountain Plains occur in the Barisan Range. Only one land system, Kuranji(KNJ) is located in MUSI river basin on gently sloping volcanic fans.

Table C2.5.1 Land Systems of Inter-mountain Land Form

Land Systems	Features
Kuranji(KNJ)	Occurs on gently sloping volcanic fans.

2.6 Inland Riverine Plains

Four land systems are separated on Inland Riverine Plains and Terraces. Solok(SLK), Tanjung(TNJ), Sungai Manau(SMN) and Sungai Mimpi(SMI).

Table C2.6.1 Land Systems of Inland Riverine Plain Land Form

Land Systems	Features
Solok(SLK)	Described on plains formed from volcanic deposits
Tanjung(TNJ)	Plains derived from non-volcanic materials
Sungai Manau(SMN)	Narrow riverine terraces and undulating to rolling riverine terraces respectively
Sungai Mimpi(SMI)	

2.7 Flood Plains and Swamps

Seven land systems are separated on the Flood Plains and Swamps. Bakunan(BKN), Beliti(BLI), Sebangau(SBG), Klaru(KLR), Kahayan(KHY), Mendawai(MDW), and Kajapah(KJP).

Table C2.7.1 Land Systems of Flood Plain and Swamp Land Form

Land Systems	Features
Bakunan(BKN)	Minor valley floors and swampy floodplains of narrow valleys.
Beliti(BLI)	
Sebangau(SBG)	The meander belts and permanently waterlogged floodplains of large rivers.
Klaru(KLR)	
Kahayan(KHY)	Coalescent estuarine and riverine plains in the delta.
Mendawai(MDW)	Peat swamps mainly in the lower reaches of MUSI river.
Kajapah(KJP)	Inter-tidal mudflats at the mouth of MUSI river and its distributaries.

3. LAND RESOURCE EVALUATION

The land resource evaluation is the assessment of land systems according to their potential for different types of land use. European Communities executed the most recent land evaluation in MUSI River Basin Study in 1989. It is based on the Framework for Land Evaluation (FAO, 1976) that has been adopted as the standard for land evaluation studies by the Government of Indonesia (GOI). The main factors considered in the evaluation processes are Climate, Elevation, Slope, Inundation Area, Soil Depth, Soil Texture, Soil Drainage, and Soil Fertility. The land was evaluated for the following land utilization types, Dryland Arable Farming, Wetland Rice, Major Tree Crops (Oil Palm, Rubber, Coconut, Cocoa, and Coffee), and Other Crops (Clove, Pepper, Sugar Cane, Pineapple, Cashew and Banana).

It has to be emphasized that the discussion of land resource evaluation in the following paragraph is relevant to a reconnaissance only. Generally, the different definition of land systems and different weight of factors get different land evaluation result. This land evaluation result can be only used as a reference to other studies. The major purpose of this paragraph is for giving a methodology of land evaluation in land use planning.

3.1 Land Suitability for Dryland Arable Farming

The factors governing the land suitability for dryland arable farming are described in **Annex C3.1.1**. The major factor is slope that greater than 8% are considered to be unsuitable for dryland arable farming. Flooding areas and poor soil drainages are considered as general factors. For example, the peat soils are associated with very poor soil drainage. Therefore, peat soils are unsuitable.

3.2 Land Suitability for Wetland Rice

The factors governing the land suitability for wetland rice are summarized in **Annex C3.2.1**. The major factor is slope that slopes of less than 1% are necessary for wetland rice as class S1, and land with slopes of 5% or more is considered to be unsuitable. Flooding is another major factor that all land with 4 time damaging floods in a 10-year period is unsuitable. Peat is a general factor that peat soils less than 50cm in depth and consist of fully decomposed organic matter can be considered as suitable

3.3 Land Suitability for Major Tree Crops

The factors governing the land suitability for major tree crops are described in **Annex C3.3.1**. The Slope is a major factor in the selection of land for all crops, all land with slopes greater than 25% is considered to be unsuitable. Flooding is a general factor for arable crops. Peat soils deeper than 100cm are considered to be unsuitable.

3.4 Land Suitability for Other Crops

Other crops include clove, pepper, sugar cane, pineapple, cashew and banana. These crops have specific requirements. For clove, good drainage is essential and water-logging is fatal; pepper can not stand water logging; pineapple can be growth on a wide range of soils, but it will not tolerate water logging; and very acid soils are unsuitable for banana. In contrast cashew is hardy and drought-resistant; it can thrive on sterile sand and is often grown on hillsides too dry and too stony for other crops.

3.5 Land Resource Evaluation

Through above land suitability analysis, each land system is suitable for which type of agriculture land in what level can be summarized as **Annex C.3.5.1**. The agriculture land type includes Wetland Rice, Dryland Arable, Major Tree (Rubber, Oil Palm, Coconut, and Coffee), and Other Tree (Cocoa, Clove, Pepper, Sugarcane, Pineapple, Cashew and Banana). The suitability levels were separated into 5 classes. S1 (Highly Suitable), S2 (Moderately Suitable), S3 (Marginally Suitable), S (Suitable for Tree Crop under Estate Management Only), and N (Not Suitable).

To use the results of the land suitability and add the factors of declared protected forest area, many types of land resources evaluation can be made. **Annex C1.2.1** shows an example of land resource evaluation map on land suitable to dryland agriculture, major tree crop, other tree crop and wetland food crops.

4. HISTORICAL CHANGES IN LAND USE

4.1 Land Use in 1980

The land use map (scale 1:500,000) in 1980 was collected from BAPPEDA map album. The land use classification in this map is shown as follows.

BAHASA Indonesia	**English**
Kampung	Built-up Area
Perkebunan Rakyat	Farmer's Plantation Area
Tegalan	Dry Land Agriculture
Sawah	Rice Field
Kebun Campuran	Mixed Garden
Perkebunan Besar	Big Plantation Area
HTI	Forest Estate
Hutan Lebat	Natural Forest
Rawa	Swamp
Alang-alang	Moorland
Sungai / Danau	River
Hutan Belukar	Virgin Forest

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.

4.2 Land Use in 2000

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 used for analysis by GIS tool. Also, for comparing with land use in 1980, the land use types were also reclassified by JICA study team. The reclassification table is shown in **Annex C4.2.1**. Completed land use 2000 map and associated table of each land use type are shown in **Annex C4.2.2**.

4.3 Land Use Changes During 20 Years

To compare the land use 1980 and land use 2000, it is easy to find that the natural forest area was dramatically dropped from 19% in 1980 to 7% in 2000. Conversely, other agriculture land, sort of rice field, mixed garden and agriculture plantation are increased. **Annex C4.1.4** shows the land use changes during 1980 and 2000.

4.4 The Processes of Forest Disappearance

This section is discussed for the whole area of South Sumatra Province. The total area of South Sumatra Province is about 87,225 km^2, and the total Musi river basin is about 59,354 km^2. The overlapped area of the Province and Musi river basin is about 56,543 km^2. More than 95% of Musi river basin is included in South Sumatra Province.

4.4.1 Forest Land Use in 1980

Through verification of forest land use data that collected from forest department, the forest land use in 1980 was divided by production forest and protection forest. The distribution of those two-type forests is shown in **Figure C4.4.1**.

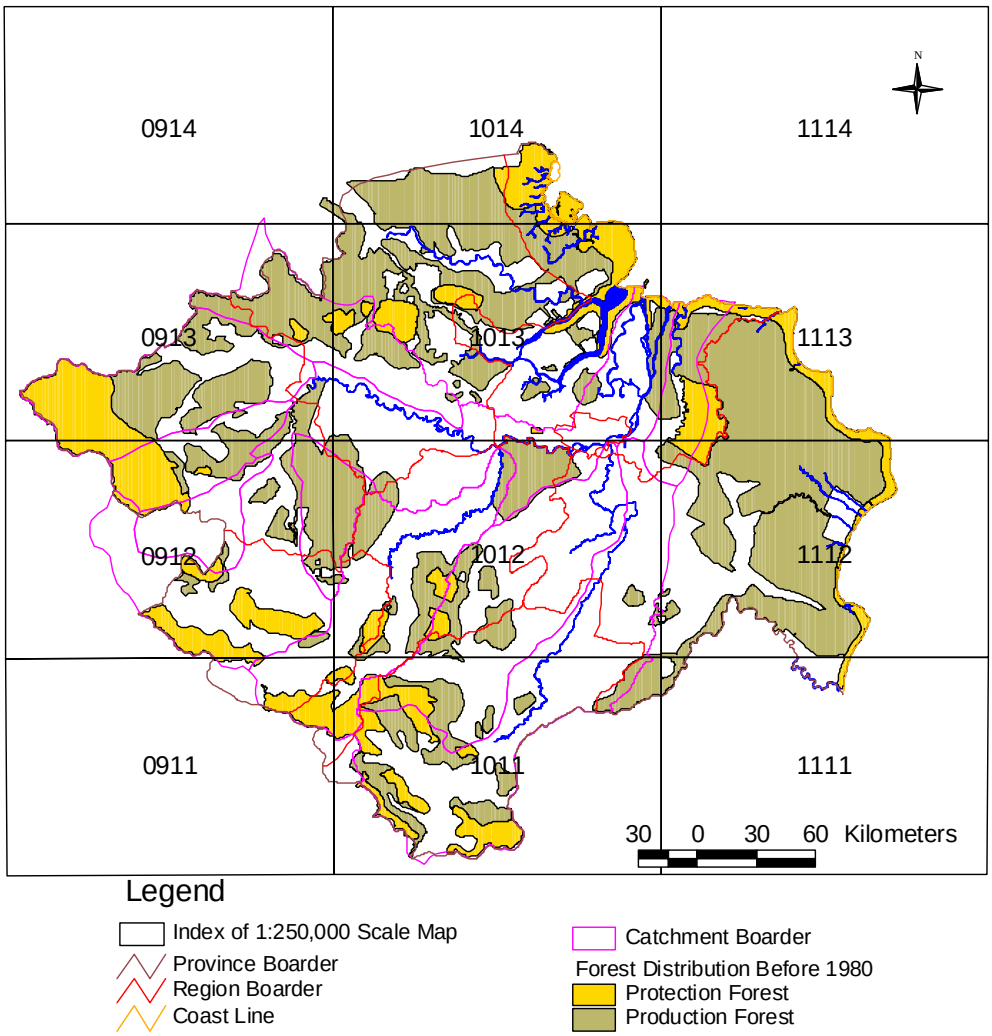

Figure C4.4.1 Forest Land Use in 1980

Source: Forest Department

The total forest area in South Sumatra province is about 43,721 km^2. The protection forest is about 11,826 km^2, and the production forest is about 31,895 km^2.

4.4.2 Legal Forest Logging

For development of local economy during 1980s, the government contracted with some private companies to log the forest in some production forest areas in a definite period. The distribution of logging area is shown in **Figure C4.4.2**.

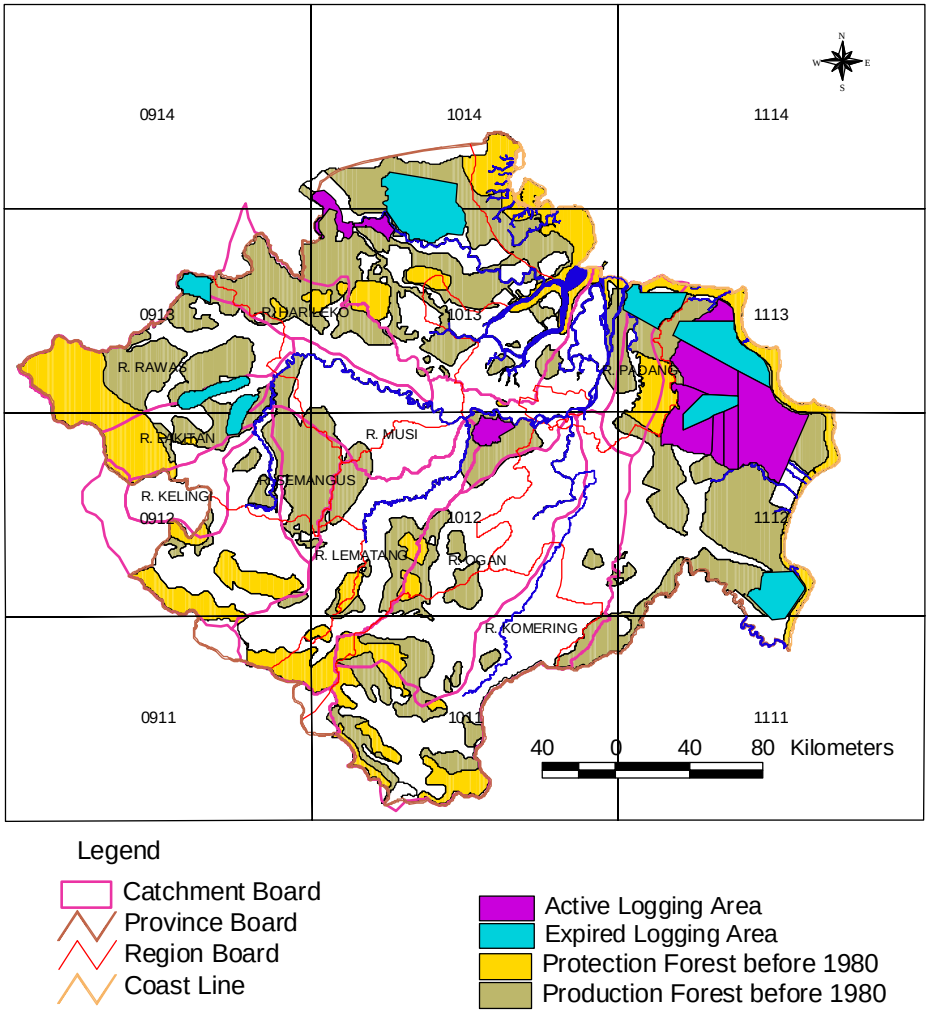

Figure C4.4.2 Legal Logging Area after 1980

Source: Forest Department

About 7,797 km^2 production forests in South Sumatra Province were made to be logging area. It occupied nearly 25% of production forest, as well as 18% of whole forest area. However, much of logging area is outside of Musi river basin. It was also separated to active and expired area by the contract term.

The active and expired logging contract in the Musi River Basin are 238 km^2 and 1,106 km^2, respectively, and those of out of the Musi River Basin in South Sumatra Province are 3,542 km^2 and 2,911 km^2, respectively.

4.4.3 Illegal Forest Logging and Transmigration

The current forest interpreted from LANDSAT TM satellite image in 2000 with overlaying on the forest land use in 1980, legal logging area, and transmigration area is shown in **Figure C4.4.3**.

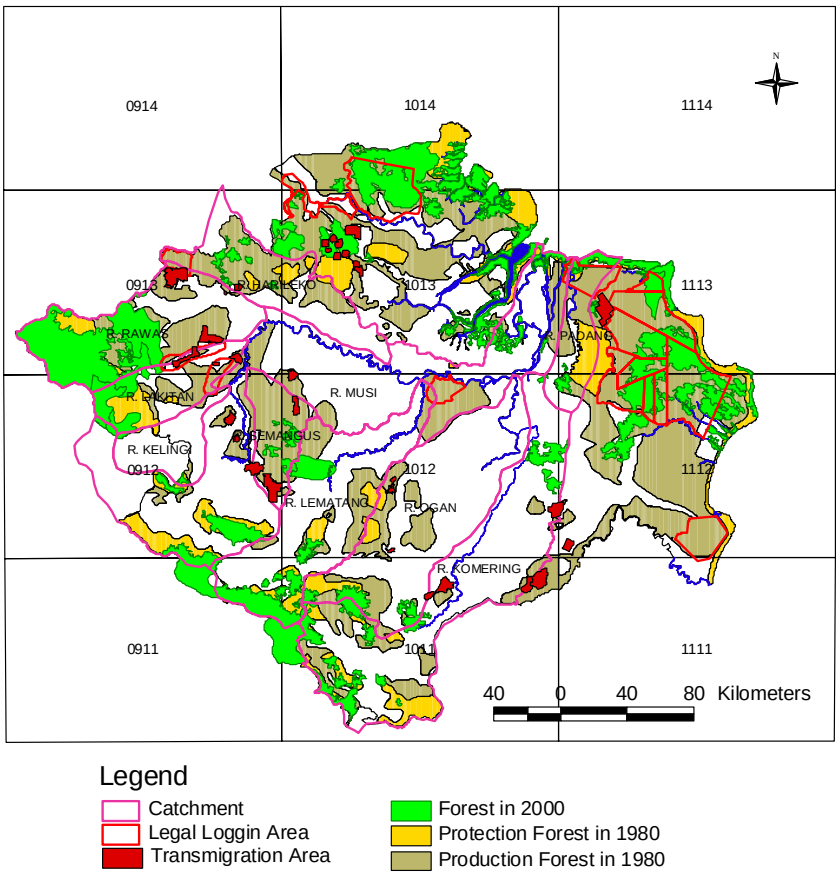

Figure C4.4.3 Current Forest Cover and Transmigration Area on Forest Land Use in 1980

Source: Forest Department

It was found the total forest area in South Sumatra Province is only 14,141 km^2. It is more clear to see the forest disappearance during 1980 and 2000 by breaking down the total forest to protection and production forest as following table.

Table C4.4.1 Reduction in Forest Area from 1980 to 2000

Forest Type	Forest Area in 1980(km^2)	Forest Area in 2000(km^2)
Protection Forest	11,826	7,404
Production Forest	31,895	6,737
Total	43,721	14,141

To overlay the forest in 2000 with the forest in 1980, legal logging area, and transmigration area, it is easy to find following two illegal logging phenomena.

(1) A large part of forest in middle land and low land was destructed. And the forest destruction areas are usually the transmigration areas. Therefore, the reasons of forest destruction in these areas can be considered as illegal logging, slash and burn farming for developing agriculture land. **Photo C4.4.1** shows a photo of slash and burn farming in middle land.

Photo C4.4.1 Forest Destruction in Middle Land (2002/9/9 in Muara Likitan)

(1) The protection forest areas in high land are also reduced fast. Through the field survey, JICA study team found there are a lot of land use changes from forest to tree crops agriculture in high land. People who live in this area usually burn the forest and mountain to make coffee land. Two typical photos taken in this area are shown as follows.

Photo C4.4.2 Forest Destruction in High Land (2002/9/10 near to Jarai)

Photo C4.4.3 Developed Coffee Land in High Land
(2002/9/10 near to Pulaupanggung)

5. PRESENT WATERSHED MANAGEMENT CONDITIONS

5.1 Forest Regeneration

Due to above forest destruction status, the government of South Sumatra Province made a forest land use plan in 1999 for expanding forest estate area. The plan includes expanding the forest area from 14,141 km^2 to 35,440 km^2 within 15 years. A total of 20,663 km^2 area is for production forest in Lahat, OKI, OKU, MURA, MUBA, and Muaraenim area, and 14,777 km^2 is for protection forest in OKI, MUBA and high land. At the same time, several forest estate projects have been implemented. The estate project and associated information were listed up in **Table C5.1.1**. The locations of the projects are shown in **Figure C5.1.1**.

Table C5.1.1 Forest Estate Status in South Sumatra Province

Estate Company Name	Company Type	AREA (km2)
PT. TUNAS BENTALA	PERTUKANGAN	179
PT. SBA WOOD INDUSTRY	PERTUKANGAN	328
PT. WAI HIJAU HUTANI	TRANS	36
PT. MUSI HUTAN PERSADA	PULP	1,688
PT. PAKERIN	PULP	1,076
Others	Others	822
	Total	4,129

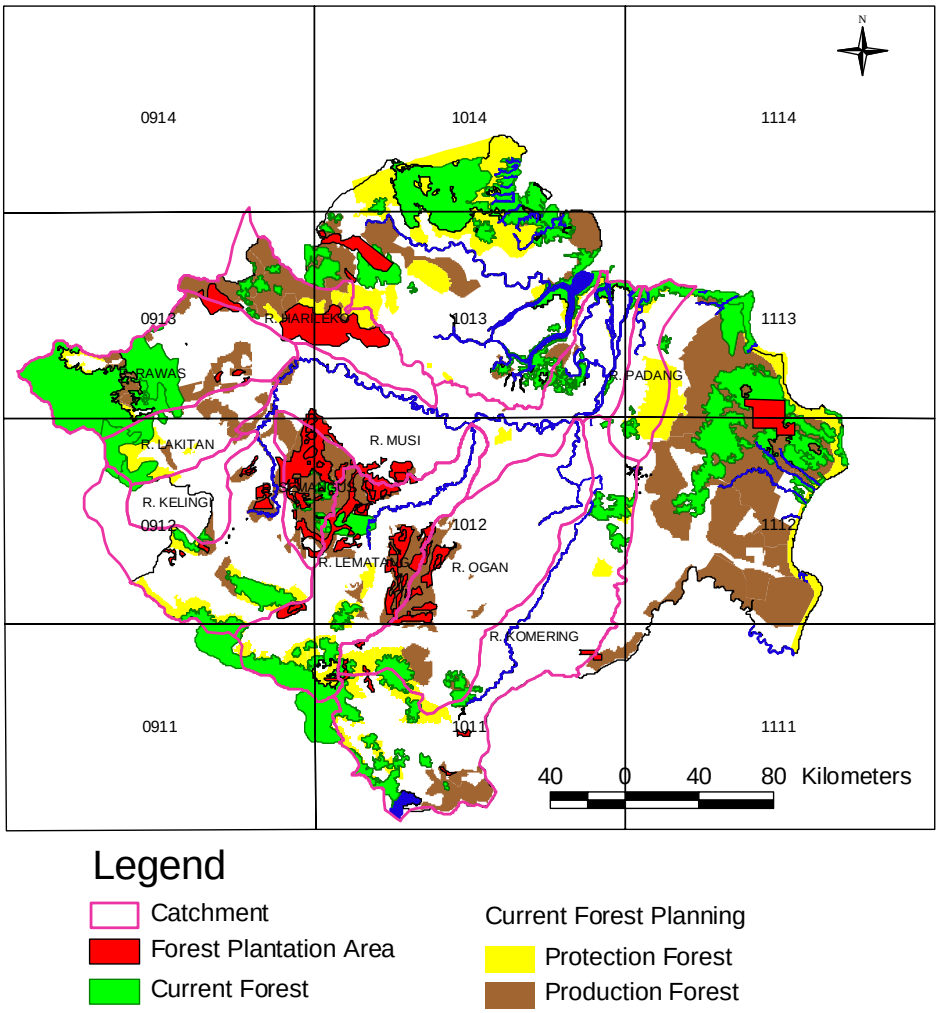

Figure C5.1.1 Project Location Map of Forest Estate

Source: Forest Department

5.2 The Agriculture Plantation

Beside of the forest estate, the agriculture plantation covered the greater part of MUSI river basin. The classification and distribution of the agriculture plantation are shown in **Table C5.2.1**.

Table C5.2.1 The Distribution of Agriculture Plantation

Plantation Type		OKU	OKI	Lahat	MURA	Muaraenim	MUBA
Food Plantation	Wetland Food	○	○	○	○	○	○
	Dry Land Food	○	○	○	○		
	Vegetable	○	○				○
Estate Plantation	Rubber	○	○	○	○	○	○
	Oil Palm	○	○				○
	Coffee	○		○		○	
	Coconuts		○				○

Source: Spatial Plan of South Sumatra Province in 1999

5.2.1 Food Plantation

The wet and dry land food plantation are mainly distributed in OKI and MUBA area. The technical irrigation paddy field is only distributed in OKI, MURA and the less capacity in OKU. The half technical irrigation paddy field is especially located in MURA and Lahat. The technical paddy field is in OKI, MUBA and Palembang. The simple irrigation paddy field is located Lahat. The swamp paddy field and tidal swamp paddy field are especially located in OKI and MUBA. Other paddy field, like seasoning farmer, is located in OKI.

5.2.2 Estate Plantation

The big rubber and oil palm plantation areas are located in OKI and MUBA. The coffee land areas are located in OKU and Lahat where is upstream of Musi river basin.

5.2.3 Influence to Natural Forest

Through referring the investment-increasing rate, the agriculture plantation land in South Sumatra Province in last fifth years grew fast, especially in oil palm plantation. It is one of major factors in destruction of the natural forest.

5.3 Preserved Area

According with the national spatial planning regulation, the preserved area includes HSA (Hutan Suaka Alam) and HL(Hutan Lindung). The HSA consists of natural preservation, wild life preservation and Tourism Park. The HL is water resource preservation forest that usually located in water resource area, river site, and seacoast.

5.3.1 Preserved Area in the Past

The previous province spatial plan in 1992 shows that the total preserved area of South Sumatra Province including islands is 109,254 km^2. The HSA is 8,226 km^2 and the HL

is 7,746 km^2. Comparing with preserved forest, the production forest is 36,645 km^2. This data shows that it is compatible with environment in South Sumatra Province.

5.3.2 Changes in Preserved Area

Unfortunately, the development activity does not follow the planning. The development area expanded to all directions and forced the forest board regression. The current vegetation data that comes from satellite images shows the forest land has dropped from 52,617 km^2 to 14,141 km^2.

5.4 Spatial Planning Organization and Laws

5.4.1 Organizations

The spatial planning organization of South Sumatra Province involved many government agencies under the province governor. BAPPEDA plays as the coordinator that adjusts the interdepartmental cooperation and manages the meeting for discussing all topics on spatial planning. There are four working groups for identifying the service agencies and watershed strategy program. The organization chart is shown in **Annex C5.4.1**.

The watershed management is a part of natural resource management. So the management planning is discussed in natural resource research group. The watershed management plan including guidelines and detail contents is made through discussion between group members. Then, the member of agencies, mostly Public Works of Water Resource Management acts as the major body for implementing and practicing the water utilization, flood control, and water environment plan.

5.4.2 Laws, Institution and Regulations

(1) Constitution

The spatial planning was mentioned in the constitution in 1945. It mentioned that the space is one of unlimited natural resource. In order to perform optimal development result, to increase the prosperity and society welfare without ignoring the continuity and balance of living environment, the spatial management should be empowered and integrated in effectively and efficiently.

(2) National Spatial Planning Guideline and Regulation

The law number 24 on national spatial planning guideline (UUPR:Undang-undang Penatann Ruang) was set up in 1992. Based on this guideline, the direction of space development, management and utilization must be qualified with environment and humanity. The spatial planning should be formulated hierarchically that starts from general/macro level to detail/micro level.

Subsequently, the national spatial planning coordinating board set up a national spatial planning regulation in 1997(RTRWN:Rencana Tata Ruang Wilayah Nasional, PP No.47, 1997: Peraturan Pemerintah Nomor 47 Tahun 1997). It is a

preservation criterion on management and utilization plan of national space including airspace, land, water, sea, underground water, and coastal area.

(3) Regional Spatial Planning Regulation of South Sumatra

The regional regulation number 5 at the First Level of South Sumatra (RTRWP: Rencana Tata Ruang Wilayah Propinsi Daerah Tingkat I Sumatera Selatan Nomor 5 Tahun 1994) was set up in 1994. It is the first skeleton regulation in South Sumatra Province for matching the balance eternally between development and environment. It is also for achieving the spatial planning optimally in meaning of welfare and fair society based on PANCASILA. RTRWP is a basic policy and direction compass on utilization strategy and space development for the second level region to measure development program in spatial planning.