YAYASAN Belantara

RUBBER CATALOGUE

ABOUT Yayasan Belantara

Yayasan Bersama Lestarikan Nusantara ("Yayasan Belantara") is an Indonesian grant-making institution formed in 2014 with the goal of delivering wide-ranging community and conservation results. It takes its name from the Indonesian word 'Belantara' which means wilderness or pristine forest.

Belantara primary focus is to allocate grants to support restoration, protection, conservation of endangered species (specifically Sumatran Tiger, Sumatran Elephant, as well as Sumatran and Bornean Orangutan), Institutional development, and community development and empowerment initiatives in Conservation Area, Production Forest, Protection Forest, and Social Forestry on the ten specified grant distribution areas across five provinces on the islands of Sumatra and Kalimantan (Indonesian Borneo).

Working with local communities, governments, the private sector and NGOs, Belantara relies on a multi-stakeholder approach to better inform decision-making when addressing resource management problems. As the Essential Ecosystem Areas (KEE) stretch across the grant distribution areas, a coordinated response between all stakeholders for the effective management and preservation of critical ecosystems is required.

As an independent foundation, Belantara aims to work with all parties that shares its goals, coordinating and collaborating with partner projects within each of its ten specified grant distribution areas. Belantara aims to ensure that existing initiatives are aligned, minimizing the risk of projects overlapping while maximizing information and data sharing.

Co-founder Asia Pulp and Paper significantly contributed in getting the Foundation off the ground, providing substantial financing. Additional financial resources are being raised from the public and private sectors, while investment de-risking initiatives will follow to achieve a more holistic scope of financing modalities.

RUBBER

HISTORY & FACTS

Rubber plants (Hevea brasiliensis) originated from Brazil, South America, and is a native tropical plant of the nation. It has been utilized for various purposes for centuries. In 1839, Charles Goodyear, a self-taught American chemist/manufacturing engineer managed to process latex with sulfur (vulcanization); since then, latex has become the primary material of the vehicle tire industry. With the discovery of latex and the rapid industrial revolution going on in the 1900s, rubber tire products spread throughout the world, including Indonesia. With this, began the intensive expansion of the tire manufacturing industry and the commencements of planting massive natural rubbers in the tropics that possess climates similar to the Amazon jungle (ipteknesia, 2013).

The rubber plantation in Indonesia is one of the five largest rubber plantations in the world, second to Thailand. Rubber plantations provide a significant role for the national economy: as a source of foreign exchange, a source of industrial raw materials, and a source of income for its people, especially in the rubber plantation areas. The rubber plantations also functions and serve in the preservation of the environment, one of them being climate mitigation (as a CO2 absorber and an O2 producer) and as a source of natural wood supply that can subsidize timber needs from natural forests.

From 2007 through 2010, the government through the Ministry of Agriculture launched plantation revitalization programs to support employment opportunity and bring an equitable distribution of income from the plantation sector. Data from the Directorate General of Estate Crops in 2009 show an increase growth of newly rubber plantations from previously isolated areas, triggering new economic centers in South Sumatra (Mesuji) and West Kalimantan (Sintang, Sambas).

The low productivity of a rubber estate is a challenge in developing rubber commodities in the future. The yield of rubber from smallholder farmers is between 900 - 1,000 kg/ha/year or 50 - 60% of its production potential. The banks have launched credit facilities to rejuvenate and expand rubber plantations. 2007 through 2010 has been a successful period in the revitalization of 250,000 hectares of old/broken/unproductive rubber plantations and the expansion of 50,000 hectares of rubber plantations.

For 2017, the Ministry of Agriculture targets to add 14,750 hectares of replanted rubber trees, one and a half times more than 2016's 9,650 hectares (Azizah, 2017). The Agency for The Assessment and Application of Technology (BPPT) also contributed by conducting researches in rubber plant breeding and assessing high productivity rubber seeds with Japan (Detik, 2015). BPPT also conducted studies on pests of rubber plants and the utilization of remote sensing for the monitoring of rubber plantations.

THE ECONOMICS OF INDONESIAN RUBBER PRODUCTION

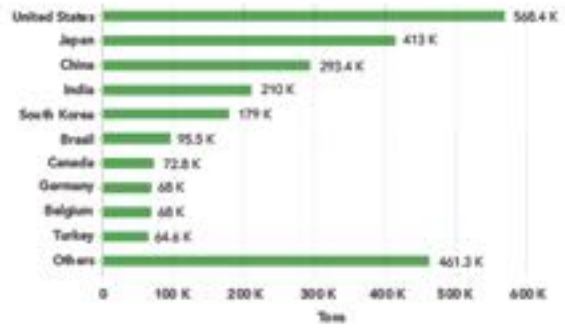
Indonesia has more than 3.621.102 ha of rubber plantations, 84.9% of it are smallholders. Based on Indonesia's rubber plantation statistical data, its rubber commodity decreased in production in 2014 (3,153,186 tons) and 2015 (3,145,398 tons) after experiencing the peak of production in 2013 with 3,237,433 tons of rubber. The decline in production was suspected to be caused by the fall in rubber prices at the smallholders level, which made smallholders reluctant to harvest rubber.

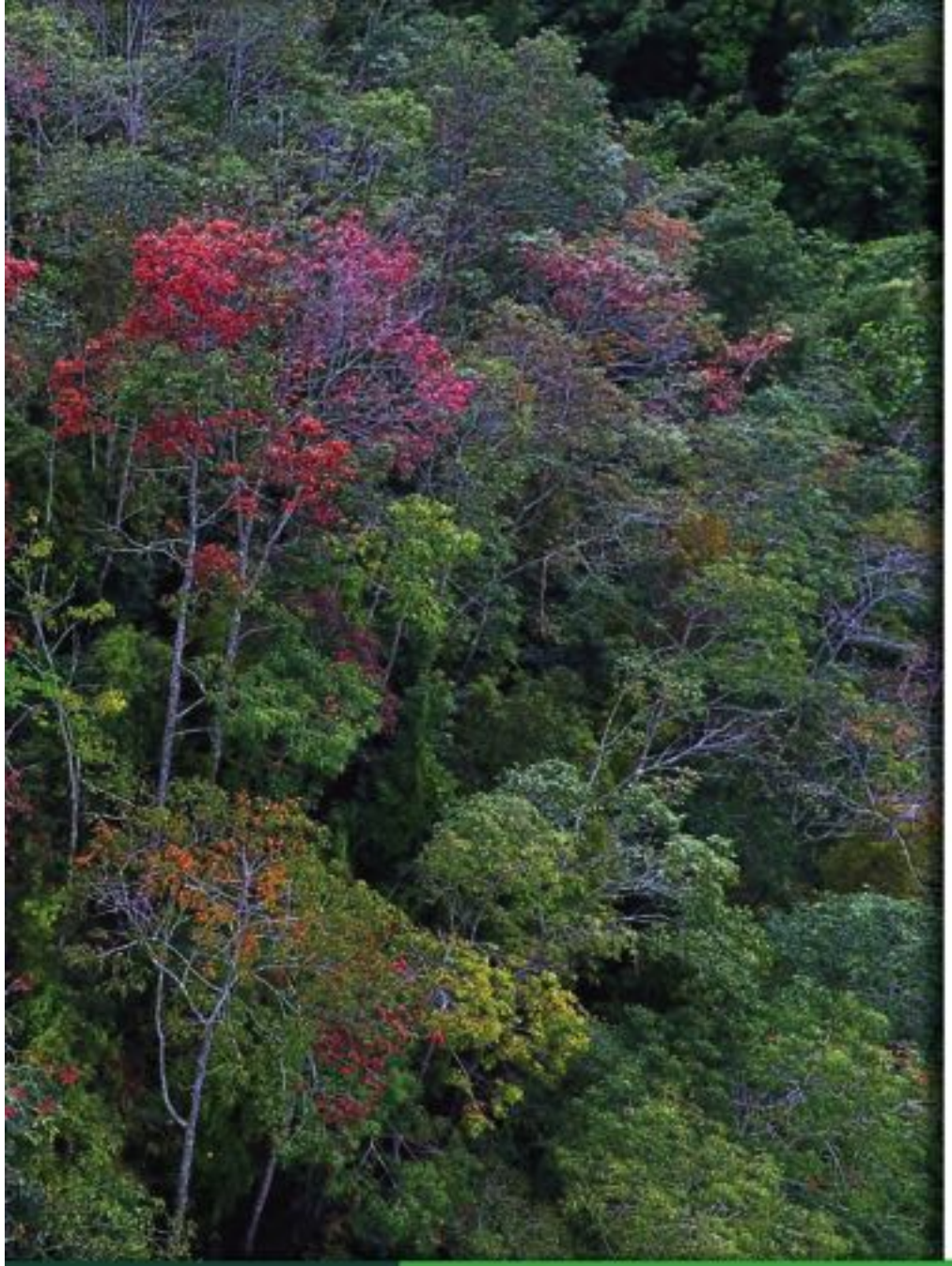
Compared to neighboring countries, the area of smallholder rubber plantations does not correspond with the amount of yield that should be able to produce. Smallholder rubber plantations in Indonesia can only produce 0.83 tons of latex per hectare compared to the government plantations 0.98 tons per hectare, and the private sectors rubber plantations which can reach up to 1,11 tons per hectare.

In 2012 Indonesia's rubber plantation was able to reap US $ 69,804 billion from rubber exports but showed a downward trend both from its export volume as well as its value, which dropped to US $ 41,159/ton in 2015.

The low productivity of Indonesian rubber estates compared to Malaysia (1.5 tons/ha), Vietnam (1.7 tons/ha), and Thailand (1.8 tons/ha) (anonymous, 2016), was a serious concern for the Ministry of Agriculture and BPPT (The Agency for The Assessment and Application of Technology).

The export volume of crumb rubber throughout 2016 reached 2.49 tons, a decline in exports by 1.9 percent from the previous year's 2.54 tons (Katadata, 2017).





RUBBER
CLIMATE AND TYPES

Climate

Rubber plants are tropical plants. Therefore, the suitable area to grow rubber plants is between the 15th parallel north - 15th parallel south of the equator. Growing rubber plants outside of that zone would hinder its growth and set back the start of production. The annual rainfall suitable for plant growth is between 2000mm - 4000mm per year, divided into 100-150 rainy days. The number of rainy days and the mean of the annual rainfall will affect the production. Because of its wetter climate, the western parts of Indonesia, namely Sumatra, Java, and Kalimantan are more suitable for rubber plants. Rubber plants grow optimally in the lowlands at an altitude of 1-200m above sea level. The higher the altitude, the slower the growth rate; the height of the rubber tree would be lower than it's potential height. An altitude of more than 600 meters above sea level is no longer be suitable for rubber plants. The required temperature for a rubber plant to grow is between 25°c - 35°c with an average temperature of 28°c.

Types of Rubber Clones

Rubber clones are progenies obtained through the vegetative propagation of a parent (cloned) rubber plant to retain its characteristics. The aim is to achieve uniformed rubber plants. Environmental conditions, such as the type of soil, the soil's fertility, the altitude, climate, specific nutrient deficiencies, protections applied and so forth can cause differences to occur in cloned plants. The Getas Rubber Research Center (Balai Penelitian Getas) have issued superior rubber clones as cultivation seeds, which are: AVROS 2037, IRR 118 and PB 260.

1. AVROS 2037 CLONE

GENEOLOGY: AVROS 256 X AVROS 352

Characteristics: The stems are erect but slightly curved at the end and are tubular to flat shaped. The stems bark color is dark brown, with cracks in the form of a net and very narrow, slightly lenticel and smooth. The Leafstalk is slightly convexed, long, thin, and a little bit flattened downwards, and the leaf base is small. The leaf has a dark greenish yellow color, with thin, not rigid, elliptical to a slightly oval shape with the length 2.5 times the width. The edges of the leaf have a bit of irregular wave, with wide leaf tips that are slightly curved with short leaf tail edges. The cross-section of the leaf is flat. The color of latex is yellow.

2. IRR 118 CLONE

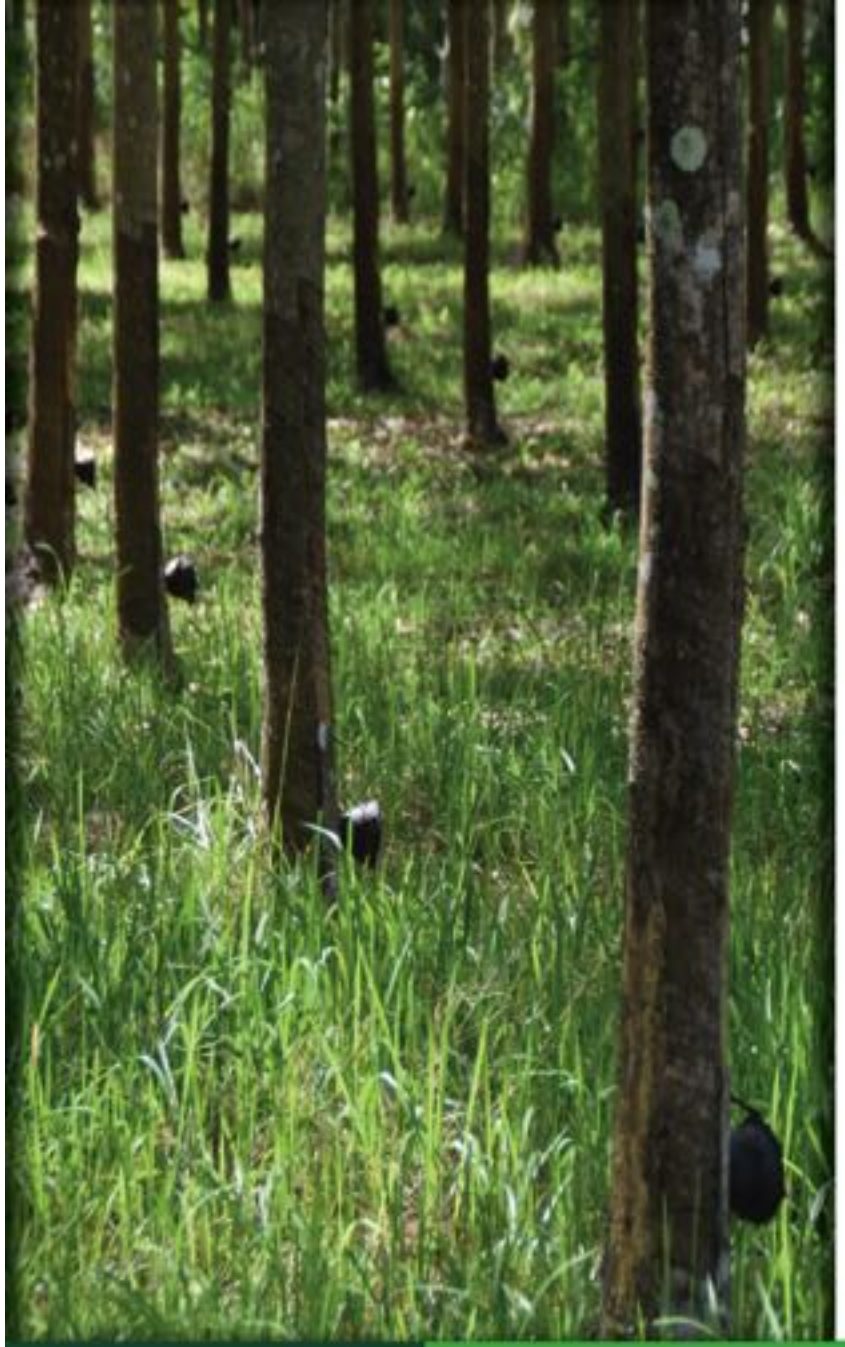
GENEOLOGY: LCB 1320 X FX 2784

Characteristics The color of the leaves is light green, with a dull-colored sparkle and fine texture. The leaves are slightly stiff, oval in shape (slightly), with flat leaf edges. The cross-section is elongated, flat cross-section, separate leaf strands, the leaf size ratio is 2.4: 1. The child of the petiole is flat and straight. The Leafstalk is positioned horizontally with and straight. Has an irregular narrow stem skin, with brown cork skin color and the latex color is white.

3. PB 260 CLONE

GENEOLOGY: PB 5/51 X PB 49

Characteristics: The leaves are dark green colored, with shiny fine texture and rigid stiffness. The leaves are also oval shaped, with slightly wavy edges. The cross-section is shaped like the letter V. The leaves are spaced and tangled separately. The leaf size ratio is about 2.4: 1, with a slightly dropped leaf-stem that is straight, rather long and has a narrow-angle (≤ 60 °). The petiole is straight, flat shaped and is medium length. The skin of the stems is dark brown and has a dash mesh pattern. The PB 260 latex color is white.



GEOGRAPIC AND CLIMATE INFORMATION OF SOUTH SUMATRA PROVINCE

Source: Central Bureau of Statistics, South Sumatra province in figures (2007-2017)

There are three Belantara Grant Distribution Areas/Ecosystems in South Sumatra Province. The three ecosystems are (a) The Padang Sugihan Ecosystem, (b) The Dangku Meranti Ecosystem, (c) The Berbak Sembilang Ecosystem.

THE LAND CONDITION OF SOUTH SUMATRA PROVINCE

a. Soil State

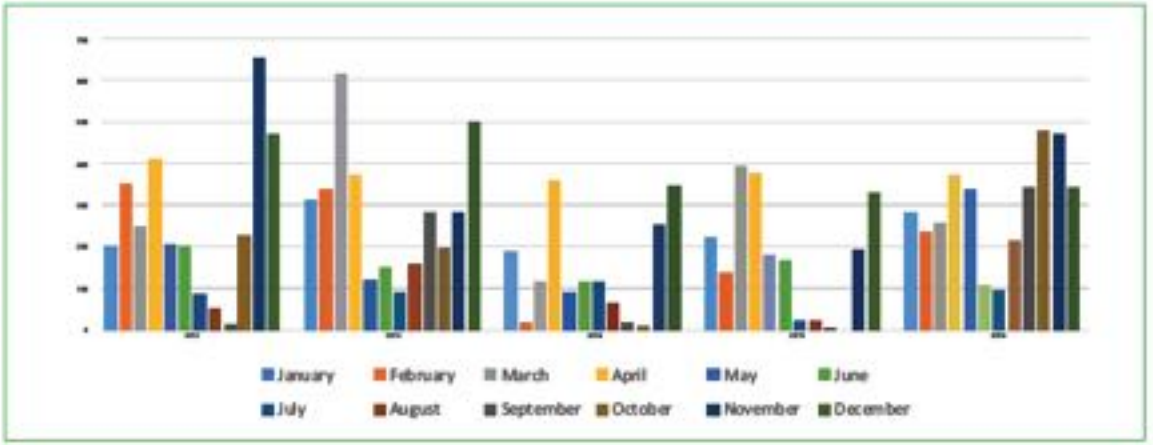
South Sumatra consists of eleven types of soils, namely:

1. Organosol : Along the coasts and bogs
2. Lithosol : Along the edges of Lake Ranau's rugged mountains region along Bukit Barisan's fault
3. Alluvial : Along the Musi River, the Lematang River, the Ogan River, the Komering River, and the ridges of Bukit Barisan
4. Hydromorphic : In the marshes of Musi Rawas and Muara Enim
5. Gley Humus : Along the coast and in the swamps
6. Regosol : Around the east coast, along the edges and in the volcano cone of Lake Ranau's rugged mountains region
7. Andosol : In all of the new and old volcanic cones; commonly found 100 meters above sea level
8. Redzina : Baturaja and its surroundings
9. Latosol : Commonly found in the drylands
10. Lateritic : In Martapura's lowland
11. Podzolic : In the lowlands and the Bukit Barisan area

b. Climate

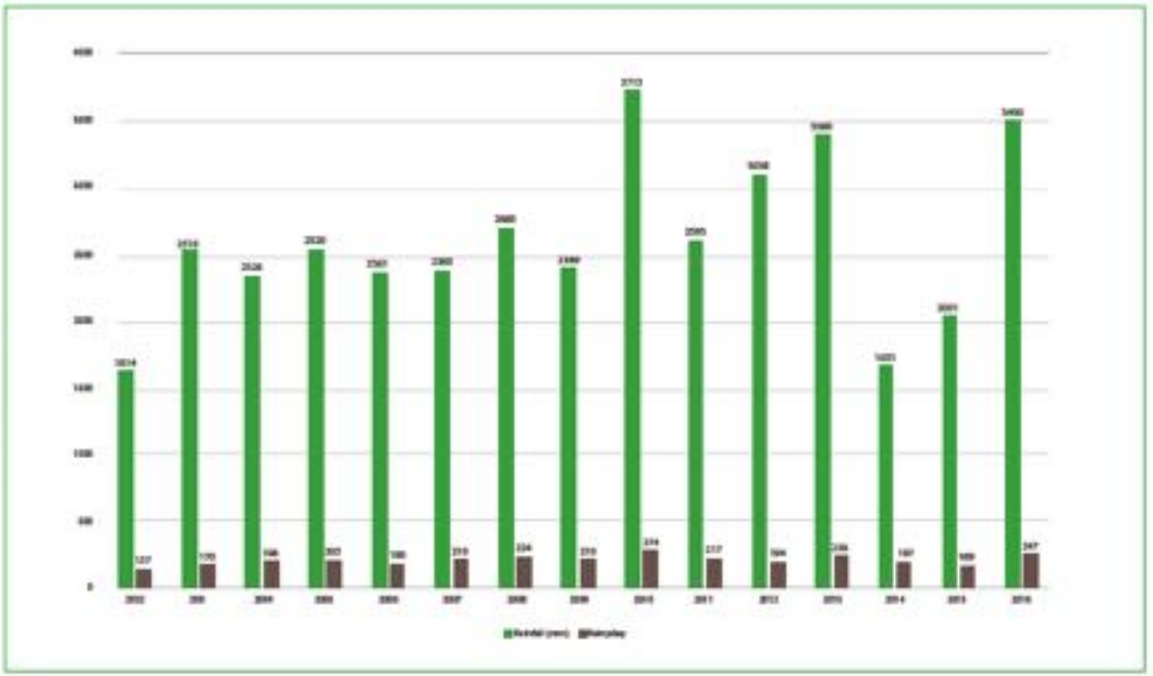
The annual rainfall graph of the last 5 years

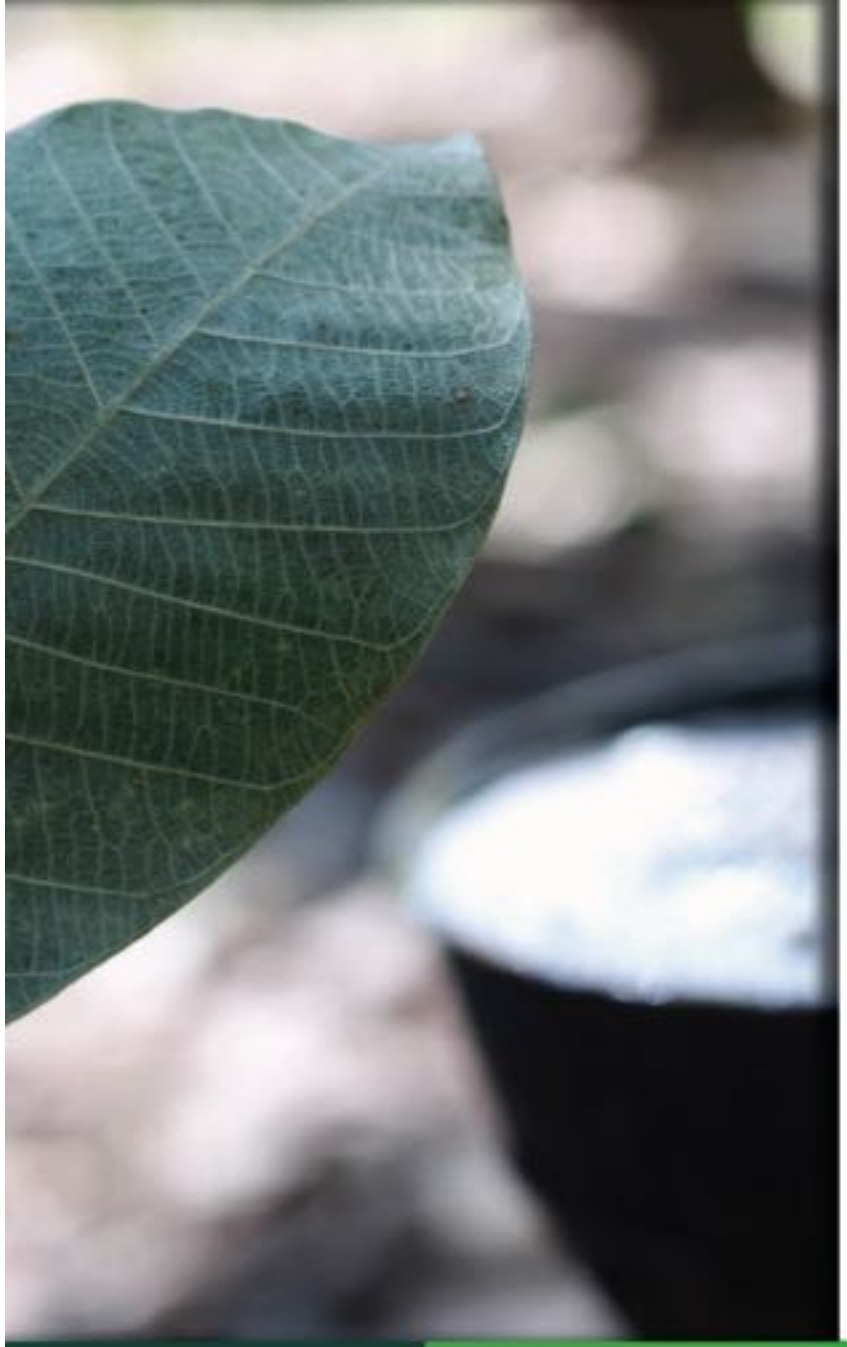
Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Kenten Station



Graph of the Rainy and Dry Seasons of the last 15 years

Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Kenten Station





GEOGRAPIC AND CLIMATE INFORMATION OF JAMBI PROVINCE

Source: Central Bureau of Statistics, Jambi (2004-2017) and Jambi's RPJMP (2011-2015)

TThere are two Belantara Grant Distribution Areas/Ecosystems in Jambi Province. The two ecosystems are (a) The Bukit Tiga Puluh Ecosystem, (b) The Berbak Sembilang Ecosystem.

THE LAND CONDITION OF JAMBI PROVINCE

a. Soil State

There are three land conditions in Jambi Province based on elevation: Lowlands, Midlands and Highlands.

Topography/Height (m/above sea level)	Area		Total Area (ha)
	Ha	%	Area/Regency
Lowlands (0-100)	3,431,165	67	Jambi city, West Tanjung Jabung Regency, East Tanjung Jabung Regency, Muaro Jambi Regency, Merangin Regency, Batang Hari Regency.
Midlands (100-500)	903,180	17	Parts of Sarolangun Regency, Tebo Regency, Parts of Batang Hari Regency, Sungai Penuh City Regency, Merangin Regency, Parts of West Tanjung Jabung Regency.
Highlands (>500)	765,655	16	Kerinci Regency, Sungai Penuh City, Parts of Merangin Regency, Parts of Sarolangun Regency, and parts of Bungo Regency.
Total	5,100,000	100	

Source: Jambi Province's Central Bureau of Statistics, Jambi Province cit RPJMP 2011-2015

a. Lowland : Dominant by lands full of water, susceptible to flood tides, many large and small rivers flow through this area, its soil is dominated by low fertility gley, and its peat areas are dominated by organosol.

b. Midland : Dominant with red-yellow podzolic soil, low fertility.

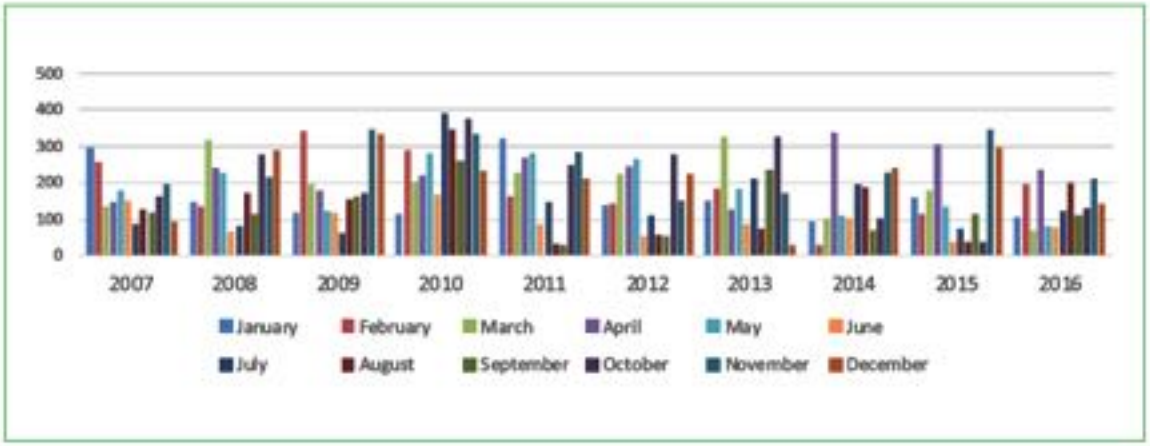
c. Highland : Dry highland that is dominant with plateus on the western part. Fertile alluvial soil could be found in the central parts of Kerinci Regency.

a. 1. The Types of Soil and it's Percentage

No.	Soil Type	Area (Ha)	%
1	Red-yellow Podzolic	2,036,386	39.93
2	Latosol	952,386	18.6
3	Low Gley Humus	547,830	10.74
4	Andosol	354,406	6.95
5	Organosol	308,338	6.05
6	Brown Podzolic +Andosol+Podzolic	275,652	5.40
7	Red-yellow Podzolic	236,343	4.63
8	Alluvial	199,553	3.91
9	Grey Hydomorphic	83,743	1.64
10	Latosol Andosol	60,032	1.18
11	Sea Swamp	42,951	0.84
12	Latosol + Litosol complex	2,380	0.05
	Total	**5,100,000**	**100.00**

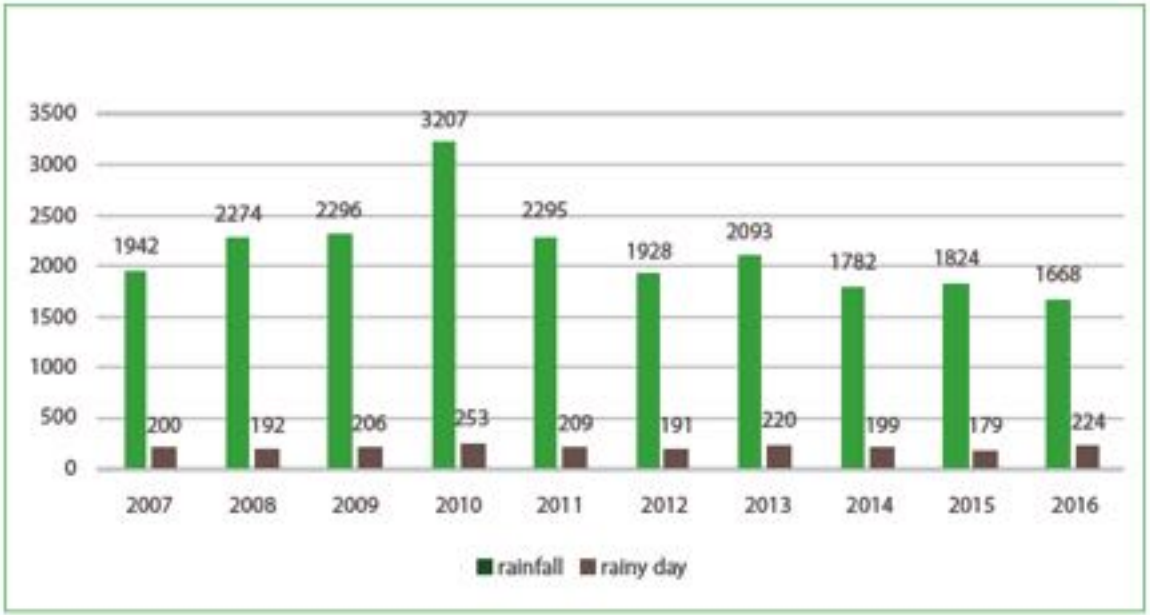
Source: RTRW of Jambi City Cit RPJMP Jambi 2011-2015

B. Climate



Graph of the Rainy and Dry Seasons of the last 10 years

Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Sultan Thaha Station



The annual Rainfall Graph of the last 10 years

Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Sultan Thaha Station

GEOGRAPIC AND CLIMATE INFORMATION OF RIAU PROVINCE

Source: Central Bureau of Statistics, Riau Province (2009-2016)

In Riau Province, there are five Belantara Grant Distribution Areas/Ecosystem. The five areas are: a. Bukit Tiga Puluh Ecosystem; b. Kerumutan Ecosystem; c. Kampar Peninsula Ecosystem, d. Giam Siak Kecil Bukit Batu Ecosystem, e. Senepis Ecosystem

THE LAND CONDITION OF RIAU PROVINCE

a. Soil State

Based on elevation there are two land conditions in Riau Province: Lowlands and Highlands.

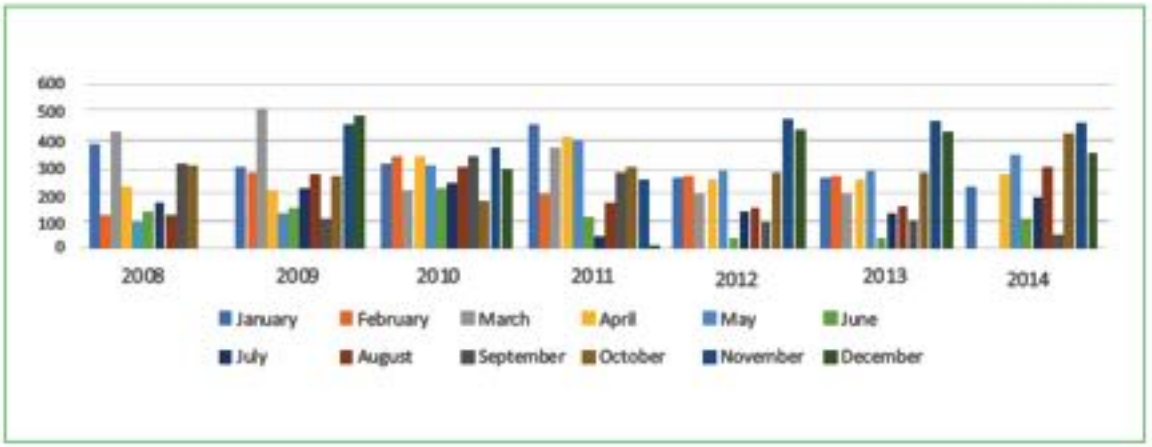
a. 1. Lowlands

No.	Soil Type	Area	Rock Form	Physiography
1	Organosol and Gley Humus	5,065,600	Alluvial	Flatland
2	Grey Hydromop	-	Alluvial	Flatland
3	Redy-Yellow Podzolic	2,156,000	Alluvial	Flatland
4	Red-Yellow Podzolic	68,000	Alluvial	Flatland

b. 2. Highlands

No.	Soil Type	Area	Rock Form	Physiography
1	Podzol	209,600	Sedimentary rock	Flatland
2	Red-Yellow Podzolic	-	Sedimentary Rocks dan Igneous Rocks	Foldland
3	Red-Yellow Podzolic (Complex)	218,200	Igneous Rocks	Intrusion
4	Red-Yellow Podzolic Latosol and Litosol	94,800	Igneous Sedimentary Rocks and Metamorphic Rocks	Mountain area

b. Climate



Graph of the Rainy and Dry Seasons of the last 7 years

Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Kampar Station

The annual Rainfall Graph of the last 8 years

Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Kampar Station

GEOGRAPIC AND CLIMATE INFORMATION OF WEST KALIMANTAN PROVINCE

Source: Central Bureau of Statistics, West Kalimantan Province (2009-2016)

In West Kalimantan Province, there is one Belantara's Grant Area/Ecosystem, which is the Kubu Raya Ecosystem.

Land Condition of West Kalimantan Province

a. Soil State

Based on its soil texture most of West Kalimantan Province consist of red-yellow podzolic soil (RYP), which spread over 10,5 million hectares or 71.28% of West Kalimantan Province. Furthermore, its soil also consists of OGH soil (organosol, gley humus) and alluvial soils, which amounts to 10.29% of West Kalimantan Province or 2 million hectares located in the coastal regencies.

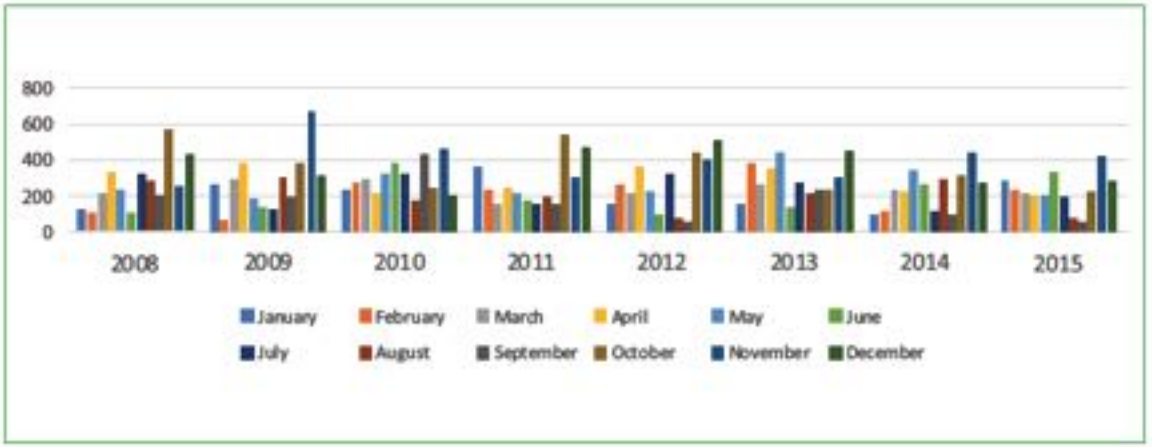
a. 1. The Soil Types per Regency/City in the Ecosystem

No.	Regency/City	OGH	Alluvial	Regosol	PMK	Podzol	Latosol
1	Landak Regency	138,152	323	0	761,014	49,621	41,600
2	Pontianak Regency	3,140	56,703	0	36,148	32,329	0
3	Kubu Raya Regency	170,584	462,437	0	33,765	25,468	6,266
4	North Kayong Regency	127,840	197,966	0	57,803	73,217	0
5	Pontianak City	3,600	7,180	0	0	0	0

b. 2. The Soil Textures of the Regencies and City in the Ecosystem

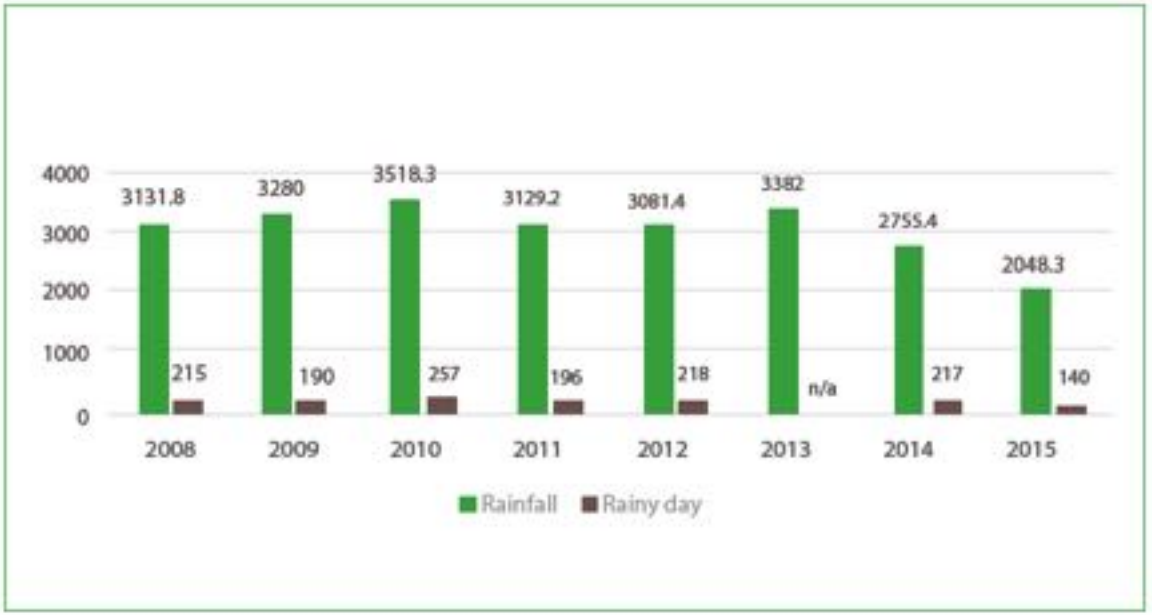
No.	Regency/City	*Smooth*	*Moderate*	*Hard*	*Turf*	*Swamp*	*Others*
1	Landak Regency	37,017	707,211	246,682	114,214	0	0
2	Pontianak City	35,282	33,149	20,095	39,164	0	0
3	Kubu Raya Regency	403,139	716	0	292,665	0	0
4	North Kayong Regency	271,005	130,369	0	55,452	0	0
5	Pontianak City	7,860	2,920	0	1,100	0	0

b. Climate



Graph of the Rainy and Dry Seasons of the last 8 years

Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Supadio Station



The annual Rainfall Graph of the last 8 years

Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Supadio Station

GEOGRAPIC AND CLIMATE INFORMATION OF EAST KALIMANTAN PROVINCE

Source: Central Bureau of Statistics, East Kalimantan Province (2009-2016)

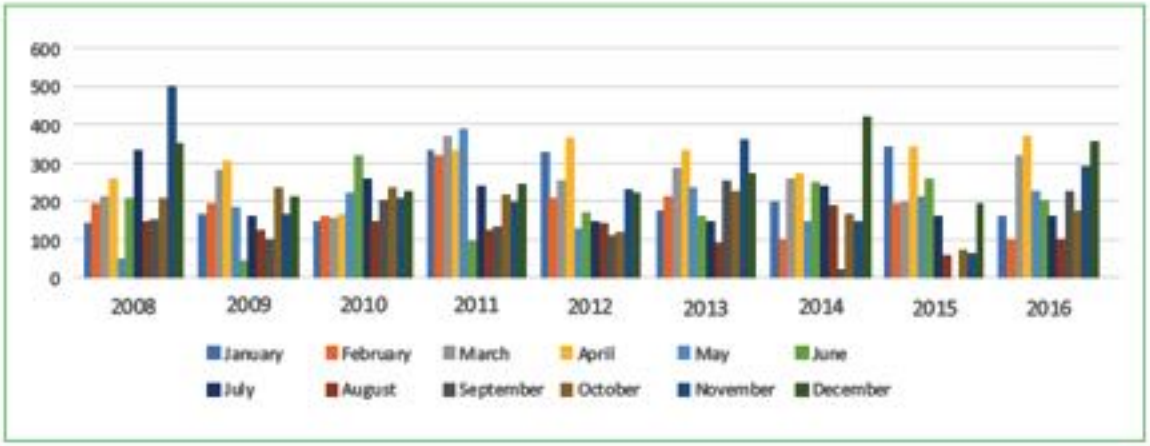
In East Kalimantan Province, there is one Belantara Grant Area/Ecosystem, which is the Kutai Ecosystem.

Land condition of East Kalimantan Province

a. Soil State

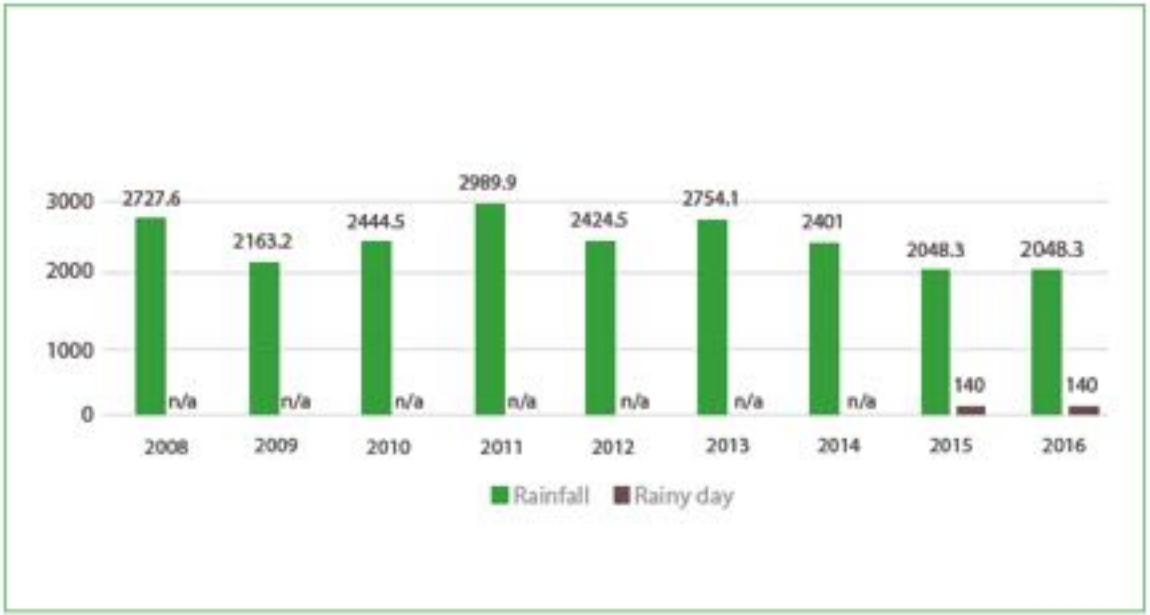
East Kalimantan Province is dominated by red-yellow podzolic soil, latosol, and lithosol types of soil, which spread over the central, and northern parts of East Kalimantan. Other soil types are organosol, latosol, and red-yellow podsolic with low fertility.

b. Climate



Graph of the Rainy and Dry Seasons of the last 9 years

Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Samarinda Station



The annual Rainfall Graph of the last 9 years

Source: Indonesian Agency for Meteorological, Climatological and Geophysics - Samarinda Station

ECOSYSTEMS

THE INDICATIVE MAP OF RUBBER

10 Ecosystems will be given (3) three classifications of suitability, which are: Very Suitable, indicating that the Ecosystem is very suitable to develop rubber plantations; Suitable, indicates that the Ecosystem is suitable, but requires treatment to yield good produce; Not Suitable, this Ecosystem requires immense effort to plant rubber plants.

1. The Padang Sugihan Ecosystem (Very Suitable for Rubber Plantations)

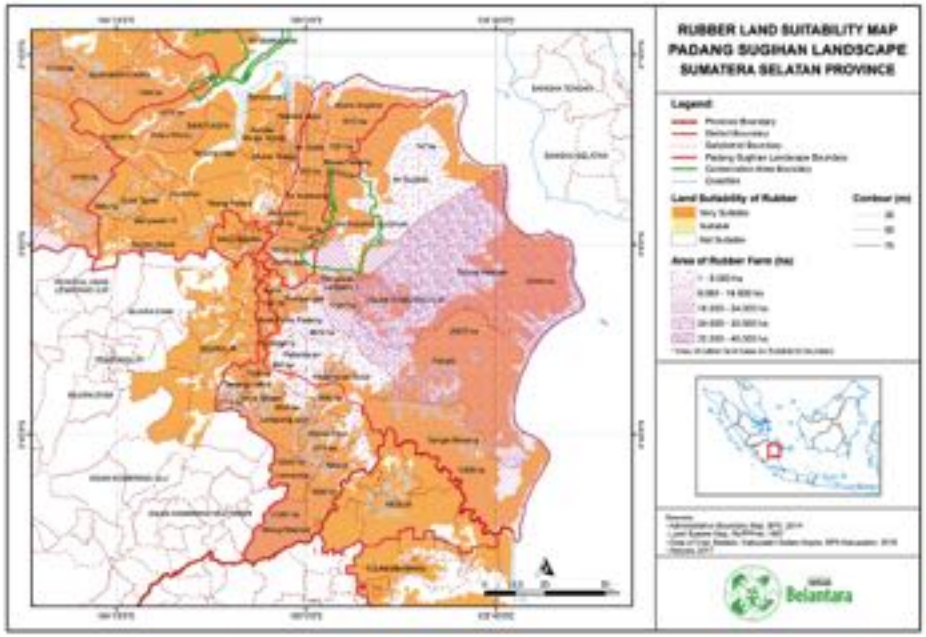


Figure 1. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Padang Sugihan Ecosystem

Map Analysis: Refer to Figure 1. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Padang Sugihan Ecosystem.

Rubber plants in South Sumatra Province have grown and been developed since 1902. The rubber plantations in the Padang Sugihan Ecosystem are spread in the two regencies of Banyuasin Regency and Ogan Komering Ilir (OKI) Regency and are owned by private, state and smallholder farmers.

Due to the rejuvenation program implemented by the South Sumatra Plantation Office, smallholder rubber plantations in South Sumatera (Banyuasin, OKI, and Musi Rawas) have the possibilities for future production increase. The rejuvenation program started in 2016, covering 200 hectares, with a total rejuvenation target of 1,600 hectares (Kontan, 2016).

The rubber plantations in Banyuasin Regency and OKI Regency face challenges concerning smallholder owned plantations that are not yet standardized. The rubber trading system in South Sumatera also needs to be repaired and improved to provide the best benefits for the smallholders.

By increasing investments in the rubber industry's downstream, the rubber trade in South Sumatra is expected to become a promising source of income and an increase of locally generated revenue (PAD).

The Social-Economic Profile of the Padang Sugihan Ecosystem: The majority of the population in the Padang Sugihan Ecosystem are high school educated. 39.86% of its population is over five years old. The number of people with higher education is less than 1%.

There are about 293,700 of productive aged people who mostly work in the agricultural sector of rice and companion crops (41,16%) and plantations (23,78%). About 6.5% of the population work in the fisheries sector, in coastal villages such as the Cengal Sub-district, Sungai Menang Sub-district, Tulung Selapan Sub-district, Muara Sugihan Sub-district, and the Banyuasin I Sub-district. The rubber commodity remains the mainstay in the plantation sector of the Padang Sugihan Ecosystem, both in the OKI Sub-district and Banyuasin Sub-district. There are also small parts of areas that are planted with palms, coconuts, cacaos, and coffees (Belantara, 2017).

Conclusion: The rubber plantations in South Sumatra are the oldest rubber plantations in Indonesia. To prepare for the challenges of the future and to increase production to fulfill the global rubber market demand, The Plantation Office of South Sumatera has implemented a program to rejuvenate the smallholder rubber plantations.

The plantation commodities in the Padang Sugihan Ecosystem

Regencies/Cities	Cacao	Rubber	Palm Oil	Coconut	Coffee	Others
Ogan Komering Ilir	396.20	153,237	12,845.00	3,895.00	277.43	4.00
Banyuasin	216.21	71,522.90	26,518.28	24,234.15	470.36	10.10

Source : South Sumatra in Figures 2014, The Regencies in Figures 2014 (South Sumatra Province's, Organ Komering Ilir Regency's, and Banyuasin Regency's Central Bureau of Statistics)

2. Dangku Meranti Ecosystem - (Very Suitable for Rubber Plantations)

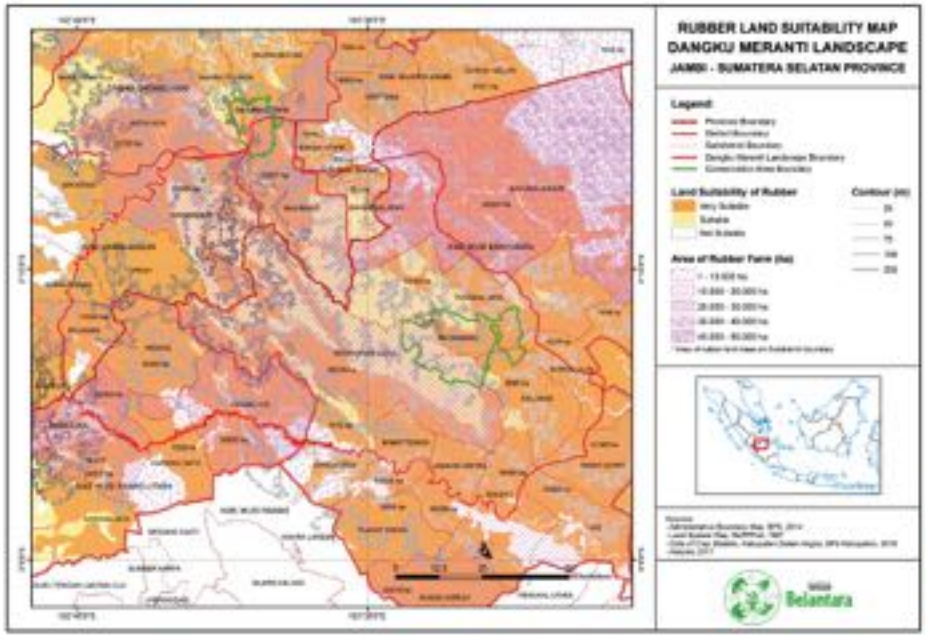


Figure 2. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Dangku Meranti Ecosystem

Map Analysis: Refer to Figure 2. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Dangku Meranti Ecosystem.

Rubber plantations in the ecosystem of Dangku Meranti have evolved and cultured together with the community to form a long-standing economic bond and as a daily custom for its people.The most massive rubber plantation area in the Dangku Meranti Ecosystem is in the South Sumatera Province part of the ecosystem, in the two regencies of Musi Rawas Regency and Musi Banyuasin Regency. Besides those two, there are four other regencies in the Dangku Meranti Ecosystem. Those four regencies are located in the Jambi Province part of the ecosystem.

In the last six years, the rubber plantations in Musi Banyuasin Regency face many challenges that impact the economy of MUBA (Musi-Banyuasin) community. The price of rubber dropping to Rp.5000-7000 per kg is not enough to support the family of smallholder farmers, to tackle this problem, the MUBA government is initiating a breakthrough solution by applicating the rubber produces as rubber asphalt for road construction in MUBA. This solution would increase the rubber uptake in MUBA Regency.

The Jambi Province government is launching a rejuvenation program with a 19.7 billion budget coming from 2017's

Revised National Budget to rejuvenate 1,750 hectares of smallholder plantations. The regencies that will be rejuvenation by this program this year are Batanghari (300 ha), Sarolangun (400 ha), and Muarojambi (300 ha). (Anonymous, 2017).

The Social-Economic Profile of the Dangku Meranti Ecosystem: The Dangku Meranti Ecosystem spreads across two provinces, Jambi Province and South Sumatra Province. It comprises of one administrative area (Jambi City), three regencies in Jambi Province, and two regencies in South Sumatra Province (Musi Rawas Regency, and Musi Banyuasin Regency). In total, there are 22 sub-districts which are partially or entirely within the boundaries of this ecosystem. 939,363 people populate this ecosystem, with the majority being Muslims.

Regarding education, 21.41% of Dangku Meranti Ecosystem's populace have not graduated primary school, 32.72% have graduated from primary school, 17.53% have graduated middle school, and 17.20% have graduated high school.

The types of crops cultivated by the smallholder farmers are rubber, palm oil, cacao, coconut, and coffee. There are 520,313.14 hectares of rubber smallholders, and 203,874.90 hectares of palm oil smallholders. Cacao crops are dominant in Muaro Jambi Regency, while coconut crops are dominant in Musi Banyuasin Regency. Coffee is grown in Musi Rawas Regency and covers an area of 2,296.28 hectares (Belantara, 2017).

Conclusion: Musi Rawas Regency and Musi Banyuasin Regency is the backbone of rubber trade around the Dangku Meranti Ecosystem. The support given by the local Musi government in supporting the economic activities of rubber plantations makes developing rubber downstream products a promising prospect.

The plantation commodies in the Dangku Meranti Ecosystem

Regency/city	Smallholder Farmers Plantation Area (hectare)						
	Gambir	Cacao	Rubber	Palm Oil	Coconut	Coffee	Areca nut
Musi Rawas	-	408.81	170,253.69	26,753.84	206.56	2,296.28	2.66
Musi Banyuasin	108,25	295.59	145,655.74	60,829.44	3,128.60	21.53	4.44
Sarolangun	-	104.60	84,716.85	17,301.61	50.90	15.67	3.07
Batang Hari	-	100.36	68,657.74	35,187.74	143.53	5.48	13.51
Muaro Jambi	-	1,821.72	48,658.52	56,070.80	542.43	6.87	93.41
Kota Jambi	-	95.47	2,370.59	7,731.47	461.69	6.50	79.08
Total	108,25	2,826.55	520,313.14	203,874.90	4,533.70	2,352.33	196.17

Source: 2013 Agricultural Census of South Sumatra Province, 2014 Agricultural Census of Jambi Province (South Sumatra Province's Central Bureau of Statistics, Jambi Province's Central Bureau of Statistics)

3. Berbak Sembilang Ecosystem – (Suitable for a Rubber Plantations)

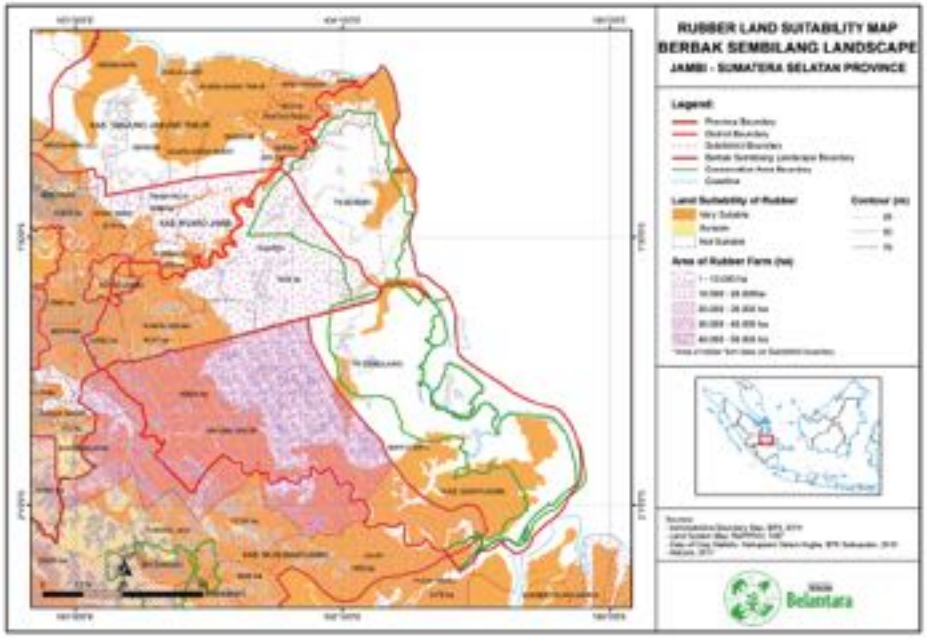


Figure 3. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Berbak Sembilang Ecosystem

Map Analysis: Refer to Figure 3. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Berbak Sembilang Ecosystem.

The Berbak Sembilang Ecosystem is within Jambi Province and South Sumatra Province. The Rubber plantations in this ecosystem are in Musi Banyuasin Regency (South Sumatera Province) and Muaro Jambi Regency (Jambi Province). Muaro Jambi Regency is one of the regencies that is going to benefit from the rubber plantation rejuvenations. The target for rubber rejuvenation in Muaro Jambi Regency is 300 hectares, while Jambi Province itself there are 125,000 hectares of land that require rejuvenation/replanting.

Provinces around the Berbak Sembilang Ecosystem has grown to become Sumatras Islands leading foreign exchange earnings from the rubber commodity.

The Social-Economic Profile of the Berbak Sembilang Ecosystem: The percentage of Berbak Sembilang Ecosystem's population that has not completed primary school is 20.56%, 31.59% graduated primary school, 16.71% graduated

middle school, 18.93% graduated high school, less than 5% achieved higher education. Of the 272,208 working aged people, 29.10% works in the plantation sector, 16.88% works cultivating rice and companion crops, 4.10% works in the fisheries sector, 16.25% works in the trade sector, 8.57% works in the public service sector, 5.76 works in construction, 4.08% in transportation and warehousing, 3.67% works in education, and 3.05% works in the processing industry.

The prominent plantations in the Berback Sembilang Ecosystem are coconuts, rubber, and palm oils. Transmigrants, utilizing two hectares of land granted by the government initially planted coconuts; by time, with palm oil and rubber companies coming in, and with the development of their plantations, coconut plants were later replaced by palm oil and rubber (Belantara, 2017).

Conclusion: The Berbak Sembilang Ecosystem's potential for rubber plantations are almost similar to the ecosystem of Dangku Meranti's. The communities in South Sumatra Province and Jambi Province depend on the of rubber trade for their livelihood.

Plantation commodity in the Berbak Sembilang Ecosystem

Plantation Crops	Plantation areas by farming household (hectare)					Total area (ha)
	Muaro Jambi	East Tanjung Jabung	Jambi City	Musi Banyuasin	Banyuasin	
Rubber	48,658.52	104.24	2,370.59	145,655.74	71,522.90	276,312.00
Palm Oil	56,070.80	41,977.70	7,731.47	60,829.44	26,518.28	193,127.69
Areca nut	93.41	15,060.69	79.08	4.44	7.03	15,244.64
Coconut	542.43	39,734.57	461.69	3,128.60	24,234.15	68,101.43
Cacao	1,821.72	96.67	95.47	295.59	216.21	2,525.67
Coffee	6.87	407.06	6.50	21.53	470.36	912.32
Gambir	-	-	-	108.25	-	108.25
Cinnamon	21.05	-	2.50	-	0.01	23.56
Clove	0.09	-	0.88	12.50	12.70	26.17
Candlenut	0.71	16.00	-	1.00	0.11	17.81
Pepper	0.60	2.47	1.02	0.06	4.76	8.89
Others	0.83	0.50	3.13	2.61	10.10	17.17

Source: 2013 Agricultural Census of South Sumatra Province, 2014 Agricultural Census of Jambi Province (South Sumatra Province's Central Bureau of Statistics, Jambi's Province Central Bureau of Statistcs.

4. Bukit Tigapuluh Ecosystem – (Very Suitable for Rubber Plantations)

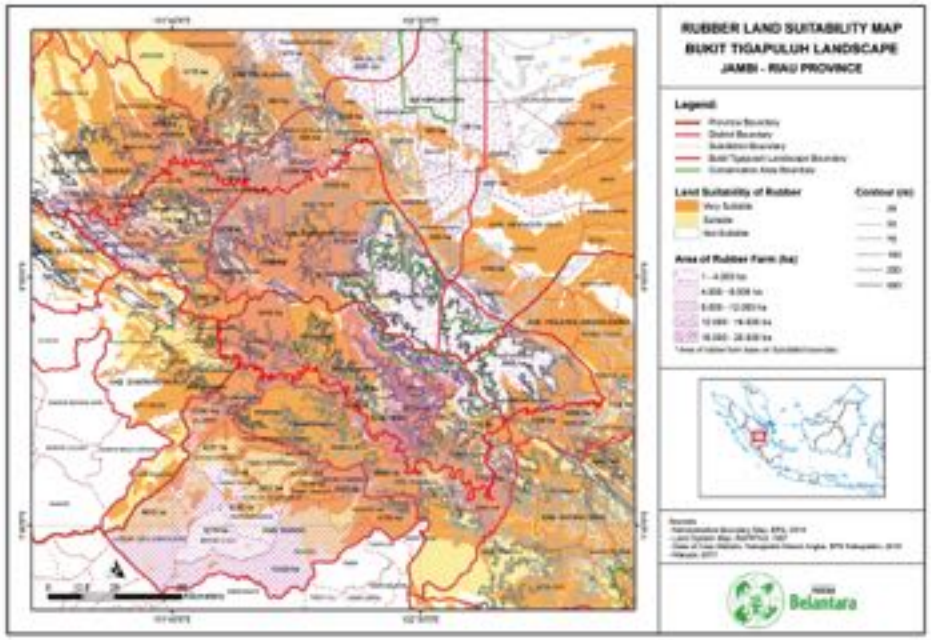


Figure 4. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Bukit Tigapuluh Ecosystem

Map Analysis: Refer to the Figure 4. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Bukit Tigapuluh Ecosystem.

Rubber plants have a long history in the surrounding areas of the Bukit Tiga Puluh Ecosystem, Jambi Province. It all started from the active trade of spices around Malacca in the 17th century AD by Jambi merchants, who brought gold, rattan, animal skin, pepper, and other agricultural goods from Jambi to trade in Malacca. Returning from Malacca, they brought a lot of trade in the form of cloth, rice, and goods considered to be commodities back to Jambi. Then, in 19 century AD, the rubber plantations in Malacca went through an extensive production phase and absorbed a lot of labor from Jambi. These labors returned to Jambi from Malacca and brought back the knowledge of rubber planting, and rubber seeds back home.

Tebo Regency is a regency in the Bukit Tiga Puluh Ecosystem with the most extensive rubber plantation area around. Tebo Regency has also received a replanting fund from the Jambi Local Government Fund (APBN-P) to replant 100 hectares of rubber plants that have entered the replanting age.

The Social-Economic Profile of the Bukit Tigapuluh Ecosystem: The total population of all the sub-districts in the Bukit Tigapuluh is 754,485. The religious makeup of this ecosystem are Muslims (94.82%), Catholics (4.24%), and the rest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(0.94%) are Protestants, Hindus, Buddhists, Confucians and other religions and beliefs. Most of the population that is five years and older graduated primary school (32%), and about 23% did not or have not graduated primary school. 18% of the population graduated middle school, and 15% of them graduated Highschool. There are only about 2.1% bachelors or postgraduates.

There are about 303,170 of productive aged people. The majority of them work in plantations (62.37% or 189,102 people), which far exceeds other sectors, such as trade (11.31%), community services (6.66%), and education (4.82%). The percentage of those working in agriculture (rice or companion crops) is tiny, 5.22% (15,204). The significant amount of workers in the plantation sector shows that this sector can absorb labor, especially smallholder farmers.

Based on the Agricultural Census of 2013 it is seen that the smallholder farmers in and around the landscape rely on three primary commodities, which are rubber, palm oil and coconut (Belantara, 2017).

Conclusion: The areas around the Bukit Tiga Puluh Ecosystem has a long history in smallholding rubber plantation. Starting from trade and the returning of labors from Malacca, the smallholder rubber plantations grew despite facing many challenges. In 2017, Tebo Regency, which is included in the Bukit Tiga Puluh Ecosystem, has received funding from the Jambi local Government Funds (APBN-P) to replant 100 hectares of rubber plants.

Plantation Commodities in the Bukit Tigapuluh Ecosystem

Regency/City	Plantation Areas (hectares)									
	Clove	Cacao	Rubber	Palm Oil	Coconut	Coffee	Pepper	Areca nut	Sago	Others
Kuantan Singingi	7.01	149.26	47,925.23	36,469.14	288	10.15	0.05	8.62	0.13	0
Indragiri Hulu	0.26	588.94	46,810.77	79,484.88	262.05	54.94	0.01	182.84	0	0.5
Indragiri Hilir	7.3	85.1	3,959.32	61,178.64	210,107.10	468.58	0.17	10,095.61	1,108.09	13.89
Tanjung Jabung Barat	0	77.22	9,754.04	54,711.50	83,587.47	3,792.77	3.18	16,712.97	0	0
Tebo	0.77	317.32	109,203..3	28,019.47	189.31	27.17	0.18	7.16	0	0
Bungo	6.27	214.69	78,759.80	34,855.78	134.2	489.63	0	10.49	0	0
Total areas (Ha)	19.61	1,385.74	296,386.90	294,468.91	248,568.14	4,803.25	3.57	26,977.69	1,108.15	14.39

Source: 2013 Agriculture Census of Riau Province (Riau Province's Central Bureau of Statistics, 2014)

5. Kerumutan Ecosystem – (Suitable for Rubber Plantations)

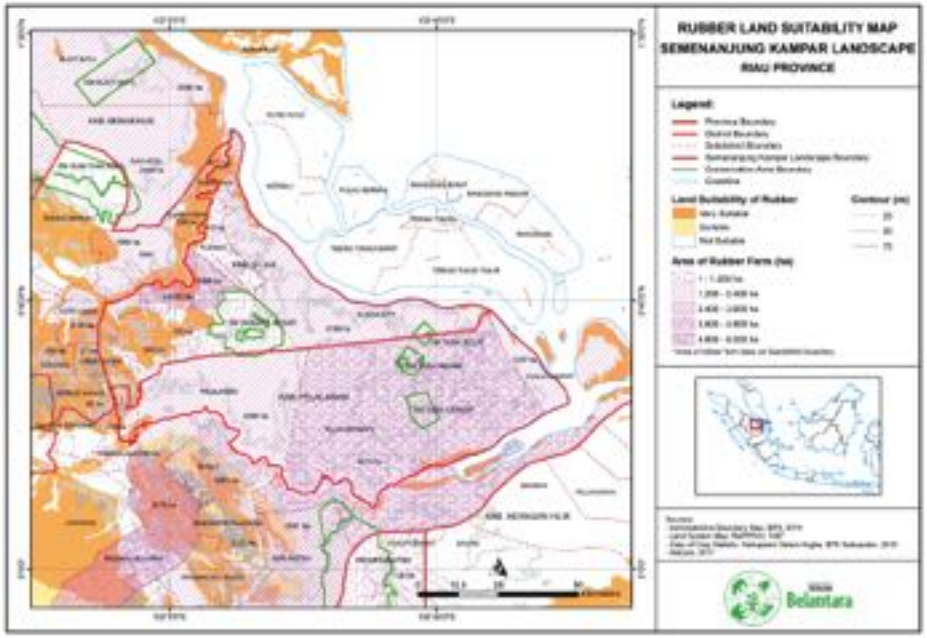
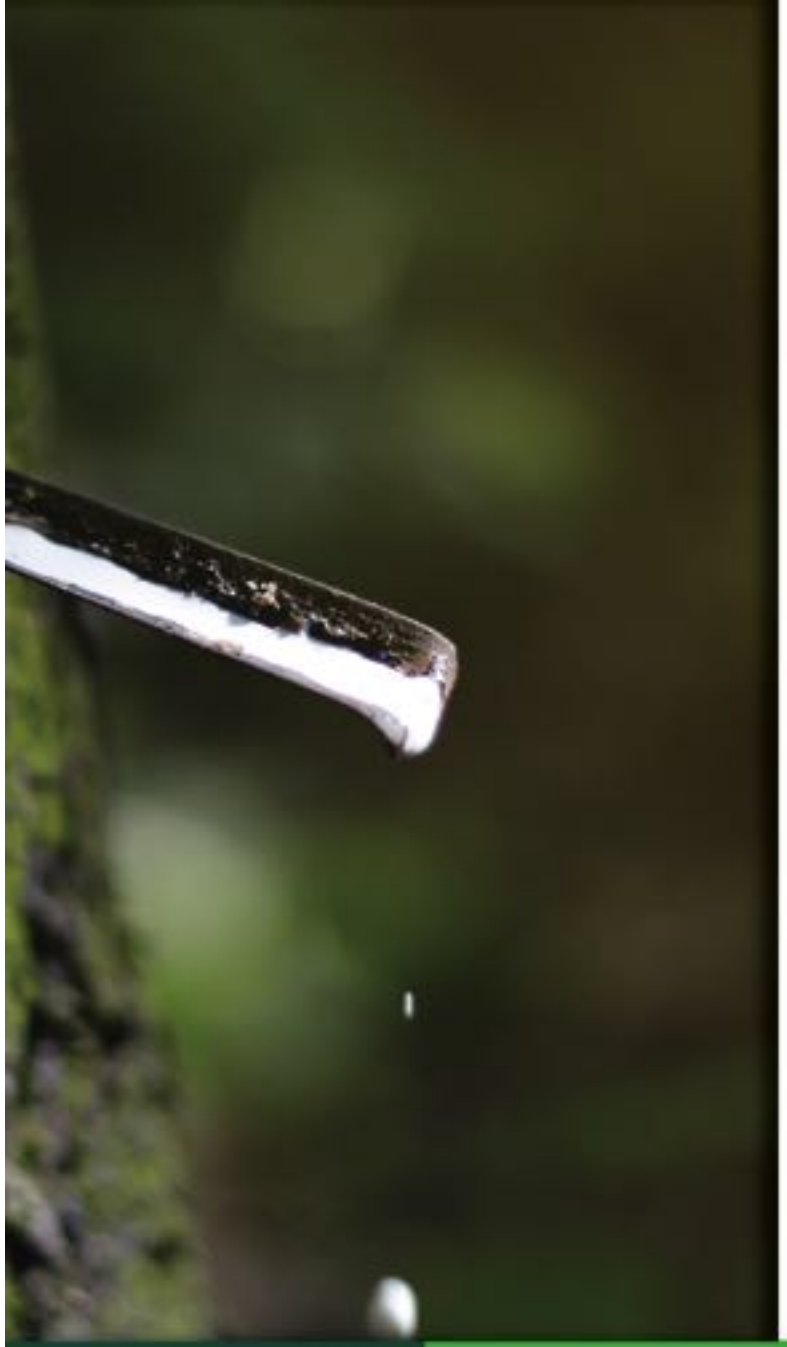


Figure 5. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Kerumutan Ecosystem

Map Analysis: Refer to Figure 5. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Kerumutan Ecosystem.

Rubber is not the primary commodity cultivated by the Kerumutan Ecosystem's society. The community grows more coconut plants than rubber trees. Rubber plantations around the Kerumutan Ecosystem are in Indragiri Hulu Regency and Pelalawan Regency. But the aging rubber plantations has decreased the quality of the rubber latex. According to the head section of Promotion and Marketing of Plantation Products of Ilir Regency, Aswin Bovita, although the majority of plantations are coconut plantations, rubber plantations in this area showed an increase in production for 3 years, namely in 2011 (1,327 tons), 2012 (1,598 tons) and in 2013 (3,552 tons) (Alby, 2016).

The Social-Economic Profile of the Kerumutan Ecosystem: The majority of the population are Muslims, while the ethnicity includes Malay, Javanese, Minang, and some Sulawesi tribes. There are two indigenous minorities in this Ecosystem, namely the Petalangan Tribe and the Duanu Tribe. There are also 29 "Pebatinan" and "Kepenghuluan" in this Ecosystem, which originated from the Pelalawan Kingdom.



The population of productive aged people in the Kerumutan Ecosystem is about 323,924 people, with the majority working in plantations (45.30%); the rest work in the trade sector (11.27%), community services (9.22%), and rice and companion crops (9.09%). Besides those, the percentage of workers in other sectors is not very prominent, the processing industry (5.55%), construction (3.39%), fishery (2.04%), and forestry (1.04%).

The majority of people aged five years and over have completed primary school (33.91%), although 21.93% have not or did not finish primary school. More than half of the Kerumutan Ecosystem educational level is primary education. Those who have graduated middle school or it's equivalent is as much as 17.16 %; high school/equivalent graduates are 16.22%.

Based on the dedicated land area and the type of plant, plantation commodities are the mainstay of the population in the Kerumutan Ecosystem, especially palm oils, with a land area of 546,094 hectares, and coconuts with the land area of 461,031 hectares. The most massive coconut plantation is located in Indragiri Hilir Regency, whereas many palm oils are grown in Indragiri Hilir Regency and Pelalawan Regency (Belantara, 2017).

Conclusion: Rubber plantations are not the primary commodities around the Kerumutan Ecosystem. The condition of rubber plantations are also quite old and needs a replanting program and an income differentiation program.

Plantation Commodities in the Kerumutan Ecosystem

Regency/City	Plantation areas and type of crops (hectares)				
	Rubber	Coconut	Palm Oil	Coffee	Areca nut
Indragiri Hulu	61,372	1,828	11,897	348	383
Indragiri Hilir	5,369	442,335	228,052	1,237	16,384
Pelalawan	29,074	16,868	306,145	1,289	53
Total	95,815	461,031	546,094	2,874	16,820

Source: 2013 Agricultural Census of South Sumatra Province, and 2014 Agricultural Census of Jambi Province (South Sumatra Province's Central Bureau of Statistics, Jambi Province's Central Bureau of Statistics)

6. Kampar Peninsula Ecosystem – (Suitable for Rubber Plantations)

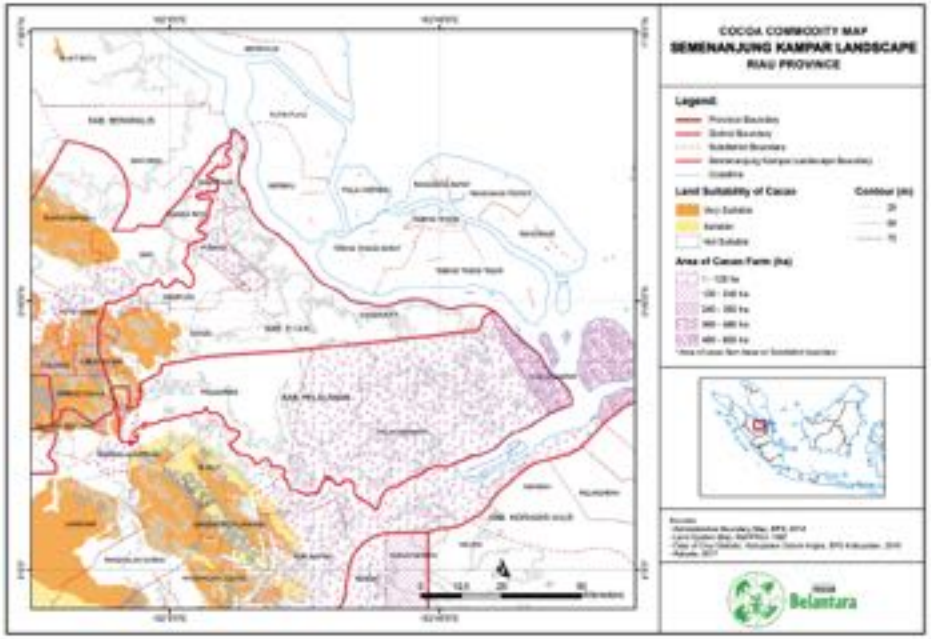


Figure 6. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Kampar Peninsula Ecosystem

Map Analysis: Refer to Figure 6. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Kampar Peninsula Ecosystem.

In the Kampar Peninsula Ecosystem, there are two regencies that are primarily dominated by palm oil commodities, and rubber commodities, with rubber commodities being the second most dominant. These regencies are Pelalawan Regency and Siak Regency.

In January 2017, the rubber commodity prices in Siak Regency rose to Rp. 7.200 - Rp. 9.600 per kilogram, where previously priced at Rp. 4,000 - Rp. 5,000 per kilogram (anonymous, 2017).

Pelalawan Regency has the most extensive rubber plantation in the Kampar Peninsula Ecosystem, covering 25,856.90 hectares of land, and is supported by Pangkalan Kuras Sub-district with 5,179 hectares of rubber plantation areas. Pelalawan Regency yielded a total production of 341,372 tons of rubber during 2013 (anonymous, 2017).

Rubber plants in Siak Regency have a long history of growth and development -since Sultan Syarif Kasim I, in the 1860s. At that time, the opening of rubber plantations was expansive and controlled the trade of Southeast Asia..

The Social-Economic Profile of the Kampar Peninsula Ecosystem: TAbout 85.69% of Kampar Peninsula Ecosystem's population are Muslims, while Protestants make up for around 11.7% of the population. The rest are Catholics, Hindus, Buddhists, and Confucians. The majority of people in this Ecosystem aged 15 years old and above have completed primary school (27.44%), although a lot of them have not (21.12%). The percentage of middle school graduates is 21.08%, while high school graduates are 18.06%. Only 6% have a higher education.

The number of productive workers in the Kampar Peninsula Ecosystem's is about 93,472 people. Most of them work in the plantation sub-sector (37.28%), the trade sector (12.28%) and social services (11.33%). There are about 7.8% employed in manufacturing, 5.49% in construction, and 5.31% in the education sector.

Population groups who work in the agricultural sector (rice and companion crops) only amount to 4.13%. The plantation sub-sector is the pillar of most people within the Kampar Peninsula ecosystem. Outside the number of people working in plantation companies, the 2013 Agricultural Census (Central Bureau of Statistics of Riau, 2014) show that at the smallholders level, palm oil has become the most widely planted commodity on their lands. The area of land planted with palm oil reached 171,191.86 hectares, which amounts to five times the area of land planted with rubber, about 34,102.14 hectares (Belantara, 2017).

Conclusion: The Siak ecosystem has an ancestral history that is familiar with rubber cultivation. Rubber plantations have become a culture of the society for economic income. Rubber prices are a significant factor in the booming rubber plantations in Riau. Even so, they still need to be supported by the development of downstream industries.

Plantation commodity in the Kampar Peninsula Ecosystem

Regency	Plantation/cultivation Areas (hectares) by small holders							
	Cacao	Rubber	Oil palm	Coconut	Candlenut	Coffee	Areca nut	Sago
Pelalawan	31.68	24,993.90	76,837.62	9,481.36	21.47	60.35	96.12	521.20
Siak	77.04	9,108.24	94,361.24	1,655.95	0.00	12.75	42.45	264.08
Total (Ha)	108.72	34,102.14	171,198.86	11,137.31	21.47	73.09	138.57	785.28

Source: 2013 Agricultural Census of Riau Province (Riau Province's Central Bureau of Statistics)

7. Giam Siak Kecil Bukit Batu Ecosystem – (Suitable for Rubber Plantations)

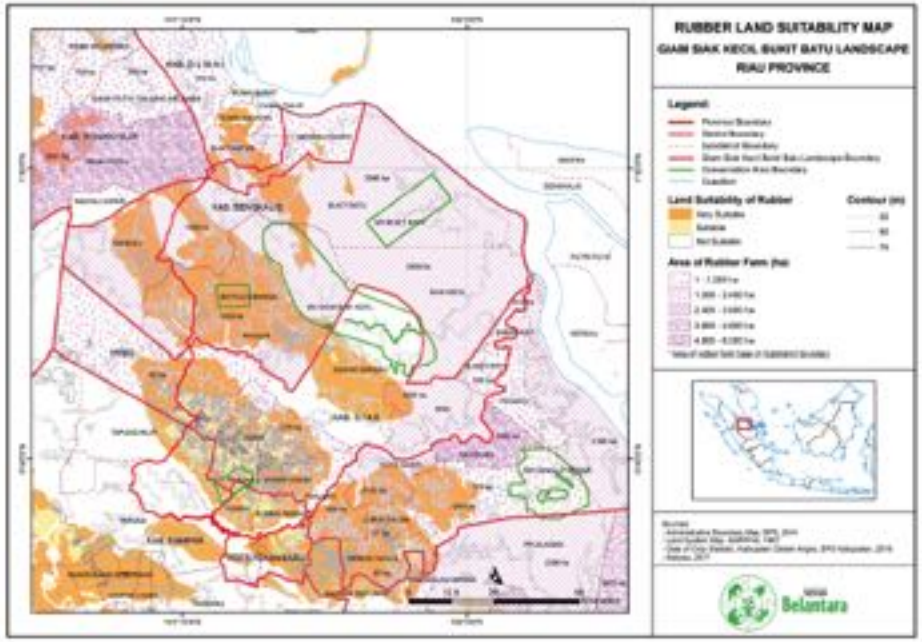


Figure 7. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Giam Siak Kecil Bukit Batu Ecosystem

Map Analysis: Refer to Figure 7. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Giam Siak Kecil Bukit Batu Ecosystem.

The Kampar Regency is one of the regencies around the Giam Siak Kecil Bukit Batu Ecosystem which has the most extensive rubber plantation in this ecosystem. For generations, rubber plantations in Kampar have been a source of economic income for its people. And, because of it's economic resources, the rubber plant is viewed as a source of prosperity by the people of Riau and has become one of the symbols of Riau Province.

The conditions of rubber plants in the six regencies that surround the ecosystem of Giam Siak Kecil Bukit Batu is currently in critical condition. In addition to the aging rubber plants, the price of rubber is still low and cannot provide the farmers with a decent life. Rubber farmers around this ecosystem need assistance in livelihood development through income differentiation by livestock training, farming companion crops that are suitable for rubber plants, and help develop household businesses through creative economy methods by empowering resources that exist in their environment. Providing aid by mentoring and facilitating production tools for business empowerment is an essential issue in helping creative endeavors.

The Social-Economic Profile of the Giam Siak Kecil Bukit Batu Ecosystem: The Giam Siak Kecil-Bukit Batu (GSKBB) Ecosystem is adjacent to the Senepis Ecosystem and Kampar Ecosystem, in fact, there are two regencies/cities in the Senepis Ecosystem that are part of the GSKBB Ecosystem.

The majority of the population are Muslims with native Malay culture. The transmigrants from Java Island, Kalimantan Island, Sulawesi Island and the Riau's surrounding areas make up for the diverse ethnic population of the GSKBB Ecosystem.

Based on the level of education, people aged five years and over have had a high school education or equivalent. From about 438,030 people, the percentage of people aged 15 years and above: 26.02% work in the plantation sector, 17.23% work in trade, 12.51% in community service, 7.66% in construction and 7.14% work in the manufacturing industry. People who work in agriculture, livestock, or fishery is only about 1-3% of the total workforce.

The 2013 Agriculture Census shows that the largest amount of planted commodities are palm oil, rubber, and coconut; a contrast from areas planted with crops such as rice, companion crops, and horticulture crops. In the same year, the total of rice fields in the GSKBB Ecosystem only amounts to 37,601 hectares of rice fields and agricultural fields. While, the total area planted with maize and cassava is only about 15,611 hectares (Belantara, 2017).

Conclusion: Surveys are needed to get enough data to operate around the ecosystem of Giam Siak Kecil Bukit Batu. Selecting smallholders around the Giam Siak Kecil Bukit Batu ecosystem requires consideration with stakeholders regarding area owners. Capacity building that can be done and are quite significant are legal awareness, the legality of things, farmers organization and the GAP (Good Agriculture Practice) with palm oil companies that are the off-takers.

Plantation commodities in the GSKBB Ecosystem

Regency/City	Plantation Areas (Ha)					
	Rubber	Coconut	Palm Oil	Areca	Coffee	Cacao
Siak	16,129	1,657	287,782	259	140	66
Kampar	101,966	1,806	387,263	99	17	286
Bengkalis	3,786	12,684	198,642	1,005	343	-
Rokan Hilir	2,639	5,469	273,145	117	20	260
Pekanbaru	2,926	6	10,745	-	-	13
Dumai	2,355	1,929	36,345	103	29	26
Total	129,801	23,551	1,193,922	1,583	549	651

Source: 2013 Agricultural Census of Riau Province (Riau Province's Central Bureau of Statistics, 2014)

8. Senepis Ecosystem – (Not Suitable for Rubber Plantations)

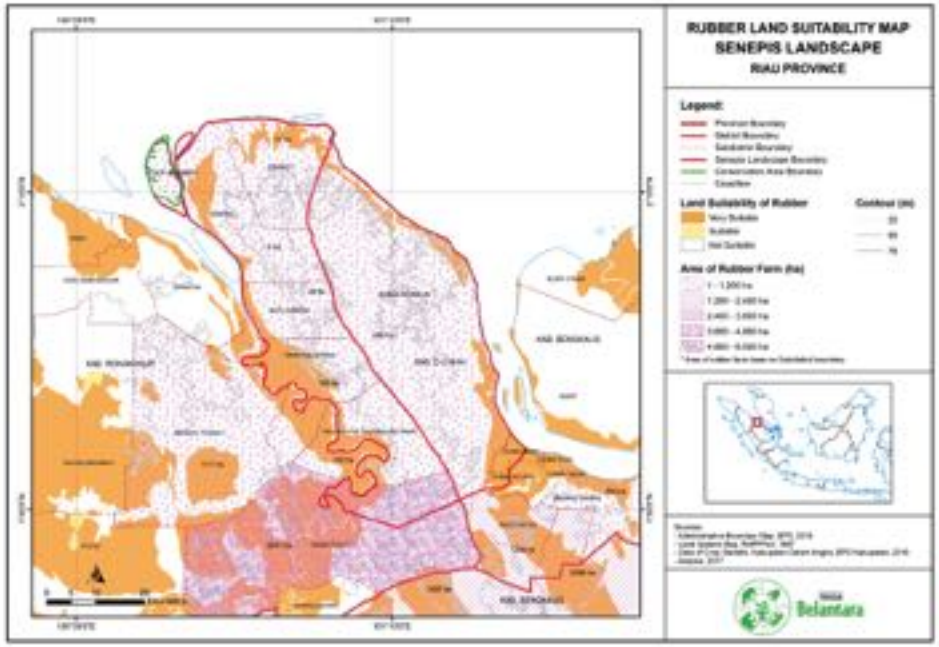


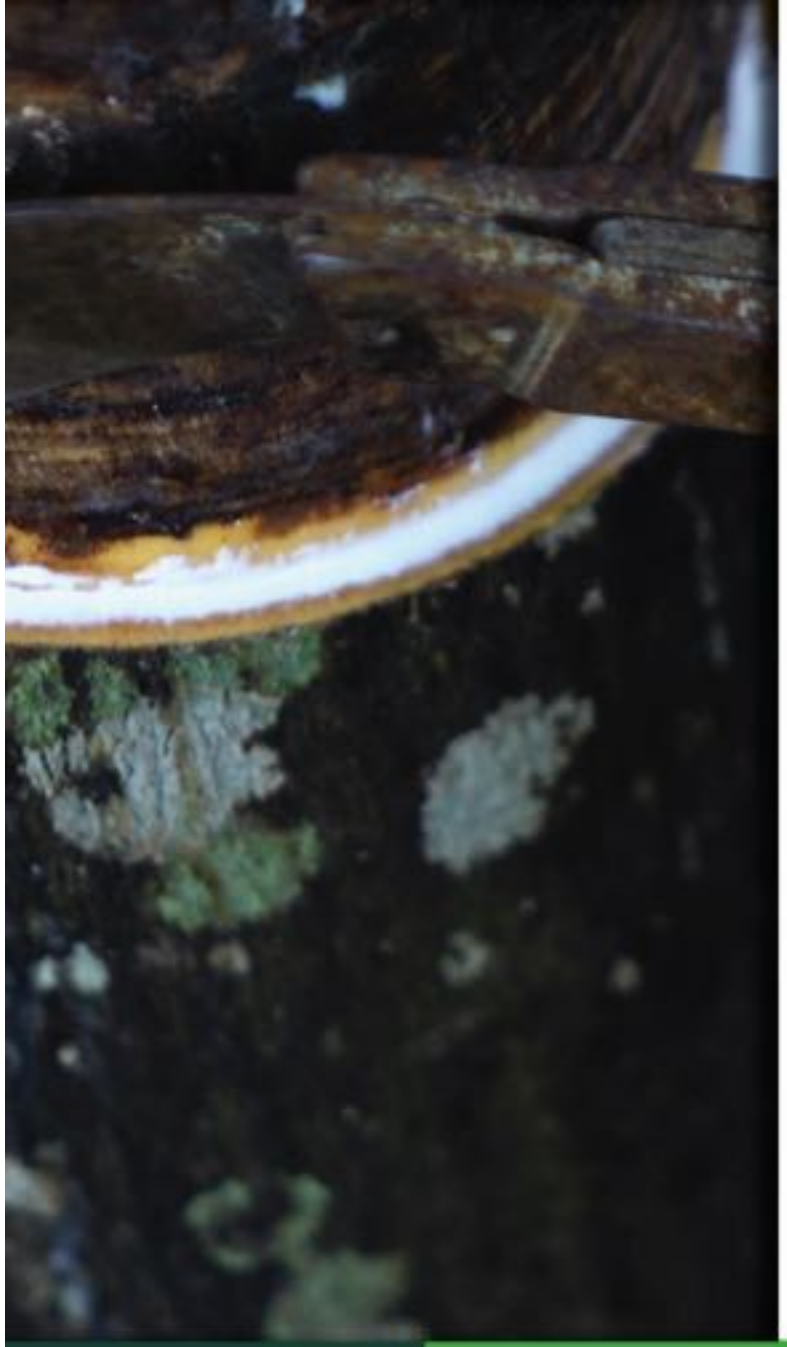
Figure 8. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Senepis Ecosystem

Map Analysis: Refer to Figure 8. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Senepis Ecosystem.

Rubber is not the primary commodity grown in the Senepis Ecosystem. Palm oil has become the primary source of income of its people, particularly in the two regencies around the Senepis Ecosystem: Rokan Hilir Regency, and Dumai Regency. Massive palm oil plantation investments in this area have made rubber crops replaced by palm oils. Because of that, palm oil is now the primary employment sector for those working in private plantations as well as private palm oil plantations (plasma) owners. Smallholder plantations that were initially from transmigrant lands are now planted with palm oil because the residents are now able to join the Palm Oil Processing Factory supply chain (PPKS).

The Social-Economic Profile of the Senepis Ecosystem: The total population of all the sub-districts in the Senepis Ecosystem is 371,701. The largest population is Dumai Barat Sub-district (89,978 inhabitants), and the least populated area is Batu Hampar Sub-district (7,213 inhabitants).

The majority of the population are Muslims, while the ethnicity is quite diverse. The natives of the Senepis Ecosystem are Malay. Tribes that have inhabited this region for years are the Minang tribe, Javanese, Bugis, and Chinese. The economic



development of Rokan Hilir Regency and Dumai City has encouraged the entry of migrant communities to work in various business sectors.

The majority (106,768) of the population have graduated primary school or its equivalent. People of over 15 years old and working is 126,889. They mostly work in the plantation sector (32.58%), growing rice crops and companion crops (12.91%), trade (12.88%) and community services (13.91%). The percentage of the people working in forestry, fishery, and mining as a whole is around 6.1%.

By comparison, more areas are planted with plantation crops than agricultural crops, such as rice or horticulture. Palm oil is the most popular commodity and has more plantation areas compared to rubber, coconut or cacao in the Senepis Ecosystem (Belantara, 2017).

Conclusion: The communities around the Senepis Ecosystem depend on palm oil for their livelihoods. Investment by the private palm oil plantations in this area is one of the factors that drove the transition from rubber plantations to palm oil plantations.

Plantation commodities in Senepis Ecosystem

Type of crops	Plantation areas (ha)		
	Rokan Hilir Regency	Dumai City	Total
Farming			
Wet rice field	12,271	244	12,515
Dry rice field	14	194	208
Corn	510	41	551
Cassava	316	223	539
Plantation			
Rubber	2,926	2355	5,281
Coconut	5,469	1,929	7,398
Palm Oil	273,145	36,345	309,490
Cacao	260	26	286

Source: 2013 Agricultural Census of Riau Province (Riau Province's Central Bureau of Statistics, 2014)

9. Kubu Raya Ecosystem – (Suitable for Rubber Plantations)

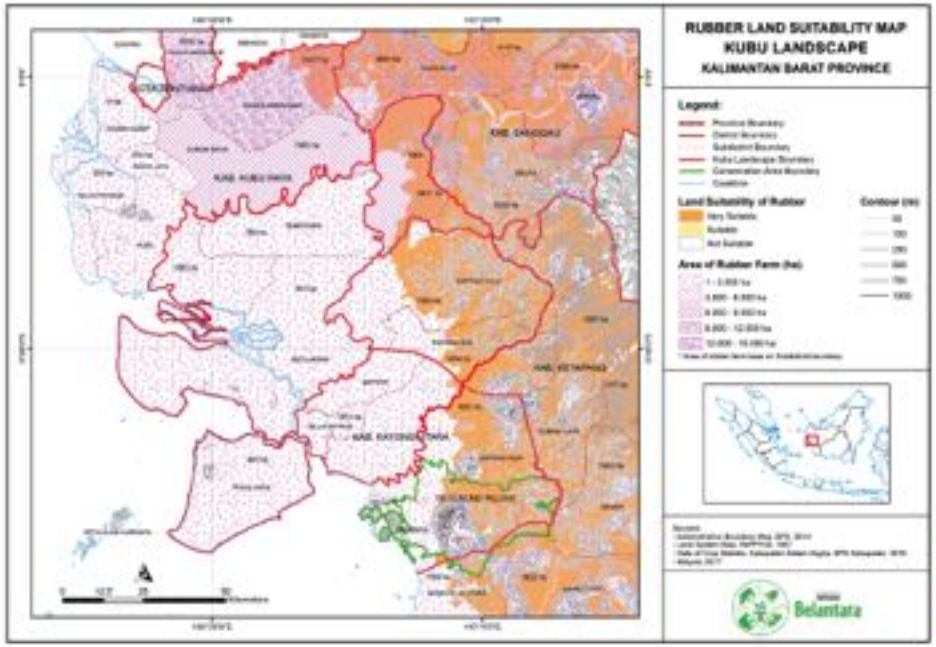


Figure 9. The Map of Land Suitability for Rubber and Areas of Rubber Farms in Kubu Raya Ecosystem

Map Analysis: Refer to Figure 9. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Kubu Raya Ecosystem.

The Kubu Raya Ecosystem is surrounded by four regencies, which are the Kubu Raya Regency, the North Kayong Regency, the Sanggau Regency, and the Ketapang Regency. On average, the condition of smallholder rubber plantations in Kubu Raya's Ecosystem has aged. For example in Terentang Sub-district in Kubu Raya Regency, since being planted in 1963, the age of rubber plants are now 65 years old. While in North Kayong Regency, the price of rubber in 2017 was too low and caused people not to maintain and neglect their rubber plantations, which caused it to burn. Their awareness of fire disasters is now little due to the previously active farming activities that were also used to monitor the presence of fire spots are no longer active due to the low rubber prices. The low prices of the rubber commodity have also impacted rubber farmers access to health and education due to their primary income that relies on the rubber plantations is practically only enough to make ends meet.

With the richness of tropical forests and coastal areas, the Kubu Raya Ecosystem has the potential for income differentiation. By increasing the capacity and supplying the farmers with production equipment to derive revenue from the coastal

potential of the ecosystem, it can be a buffer for rubber farmers when the rubber prices are low.

The Social-Economic Profile of the Kubu Raya Ecosystem: The total population in the Kubu Raya Ecosystem is 285,920 people or about 6.5% of the total population of West Kalimantan, which is 4,395,983.

According to the Indonesia Central Bureau of Statistics's 2014 data of West Kalimantan, about 46.5% of the Kubu Raya Ecosystem's population work in the plantation sector, a majority compared to other industries. Even so, there are also many of who work in the agricultural sector of rice and companion crops. The percentage of the people who work in construction, transportation, forestry, and mining sectors is below 10%. Besides those, the sectors of finance, transportation, electricity and gas, education services, and social services constitute 8.7% of the population's work sector.

Based on the educational level, the average people in the Kubu Raya Ecosystem have a basic level of education. In essence, there are those who have or are in the process of completing primary school (32%) and those who have completed primary school (30%). Middle school/equivalent graduates are 11%, while High School/equivalent is about 7%. The percentage of people with higher education (diploma, undergraduate, postgraduate) are still below 2%.

Based on the type of crops grown, rubber and palm oil are the most cultivated commodity by smallholder farmers. Based on the 2013 Agricultural Census of 2013 (West Kalimantan Central Bureau of Statistic, 2014), the amount of land planted with rubber reached 254,096.97 hectares, while the total land areas planted with palm oil reached 101,090.45 hectares. The types of crops grown by the people in Sanggau Regency are mostly palm oil and rubber, while in Kubu and North Kayong, it is rubber, coconut, and coffee. (Belantara, 2017).

Conclusion: The Kubu Ecosystem is a challenge in developing the palm oil smallholders; and because it is a peat-dominated ecosystem, the fastest route of transportation is by using waterways to reach the sites. Communities are in great need of assistance to improve their GAP (Good Agriculture Practice) capacity and require diversification of products to be planted on their land.

Plantation commodities in Kubu Raya Ecosystem

Regencies	Plantation areas /cultivation (ha)								
	Clove	Cacao	Rubber	Palm Oil	Coconut	Coffee	Pepper	Areca	Sago
North Kayong	11.74	4.63	8,218.00	252.21	3,382.50	1,020.94	22.43	6.26	-
Kubu Raya	52.31	62.50	30,392.37	3,999.41	23,209.28	4,053.33	223.10	592.04	296.97
Sanggau	48.65	951.43	121,213.67	67,400.43	670.73	10.42	1,168.20	0.02	1.44
Ketapang	3.50	94.02	94,272.93	29,438.39	1,278.97	372.00	4.79	0.98	0.34
Total (ha)	116.19	1,112.58	254,096.97	101,090.45	28,541.49	5,456.69	1,418.51	599.30	298.75

Sources: Regencies in Figures 2014 (Central Bureau of Statistics of Sanggau, Kubu, Ketapang, and North Kayong Regencies)

10. Kutai Ecosystem – (Suitable for Rubber Plantations)

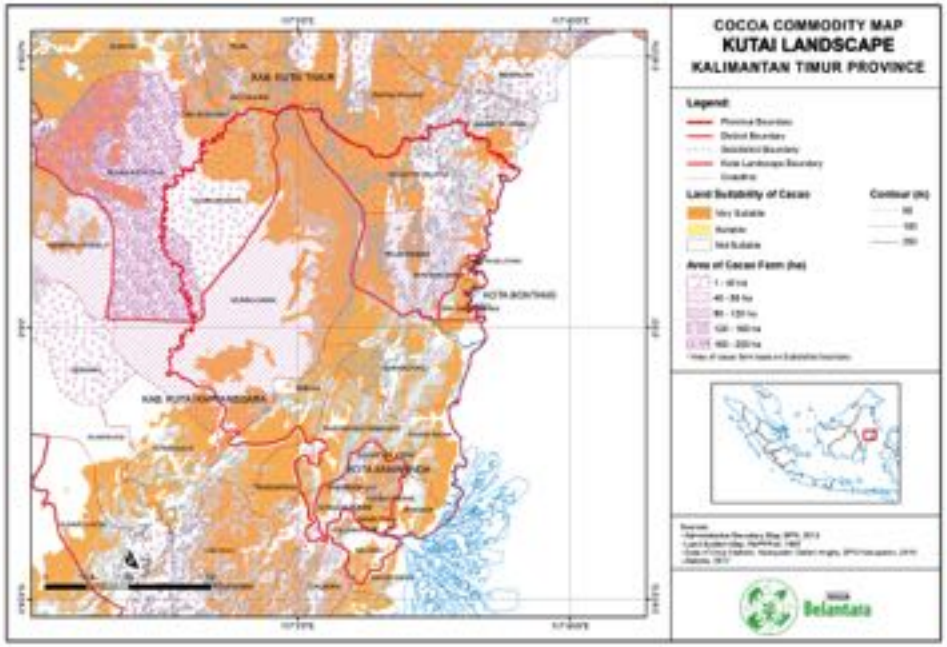


Figure 10. The Map of Land Suitability for Rubber and Areas of Rubber Farms in Kutai Ecosystem

Map Analysis: Refer to Figure 10. The Map of Land Suitability for Rubber and Areas of Rubber Farms in the Kutai Ecosystem.

There is exciting news regarding rubber development around the Kutai Ecosystem in 2017. Kutai Kertanegara Regency's government is granting aids to conduct extensification of rubber seedlings with as much as 20 hectares of land and 10 thousand rubber seeds. The development fund is derived from the National Budget (APBN) and is allocated for the sustainable plantations development program. While East Kutai Regency's government has encouraged farmers in its regency to maintain and rejuvenate with the PB 206 rubber clones that are proved to be superior in producing latex. With the rise of rubber prices in Q1 2017 and Q2 2017, it is hoped that the farmers can utilize this opportunity by increasing production by doing intensive care of their rubber plantations.

The Social-Economic Profile of the Kutai Ecosystem: The population of the sub-districts within the Kutai Ecosystem is 1,287,853 people and are predominantly Muslim (91.35%). The highest population density is in Samarinda Seberang Sub-district (9,142 inhabitants/km2), while the lowest population density is in Muara Ancalong Sub-district, which is 4.6 people/km2.

Based on ethnicity, people in the Kutai Ecosystem come from the native ethnicities in the region, i.e., Kutai and some Dayak sub-ethnic groups, such as the Kenyah. However, many residents are also of Bugis and Javanese tribes, which came from transmigration programs since the 1970s.

Based on a person's last level of education, the percentage of the population aged five years and over who has graduated high school/equivalent is 29.1%, those with only primary school/equivalent education is 22.9%, middle school/equivalent is 18.2%, and those who did or have not finished primary school amounts to 17.8%. While the percentage of people with bachelor degrees or higher is higher than people with I-III diplomas.

There are approximately 561,082 productive-aged people in this Ecosystem. The majority work in trading (17.6%), community services (12.6%), mining and quarrying (10.1%), construction (7.4%), and rice cultivation and companion crops (7.1%). Approximately 8.9% of workers work in the hospitality and restaurants, financial services and insurance, and educational services. In contrast to other Ecosystems, the plantation business in the Kutai landscape is low (3.6%). Based on the 2013 Agricultural Census, the area of plantation cultivated by smallholder farmers in the regencies/cities in the Kutai Ecosystem is not much, including the East Kutai Regency and Kutai Kartanegara Regency where most of the people work in agriculture and plantation sectors. Rubber and palm oils as a whole have the largest planting area in this Ecosystem, rubber reaching 38,942 hectares and palm oil reaching 38,938 hectares. Even so, the total area is far above the areas of land planted with coconut, cacao or pepper (Belantara, 2017).

Conclusion: Regency governments around the Kutai Ecosystem are quite active in encouraging the rubber farmers to rejuvenate their rubber trees with the superior PB 260 clone. Other forms of support from regency governments are also demonstrated by the provision of superior seeds for extensification.

Plantation commodities in Kutai Ecosystem

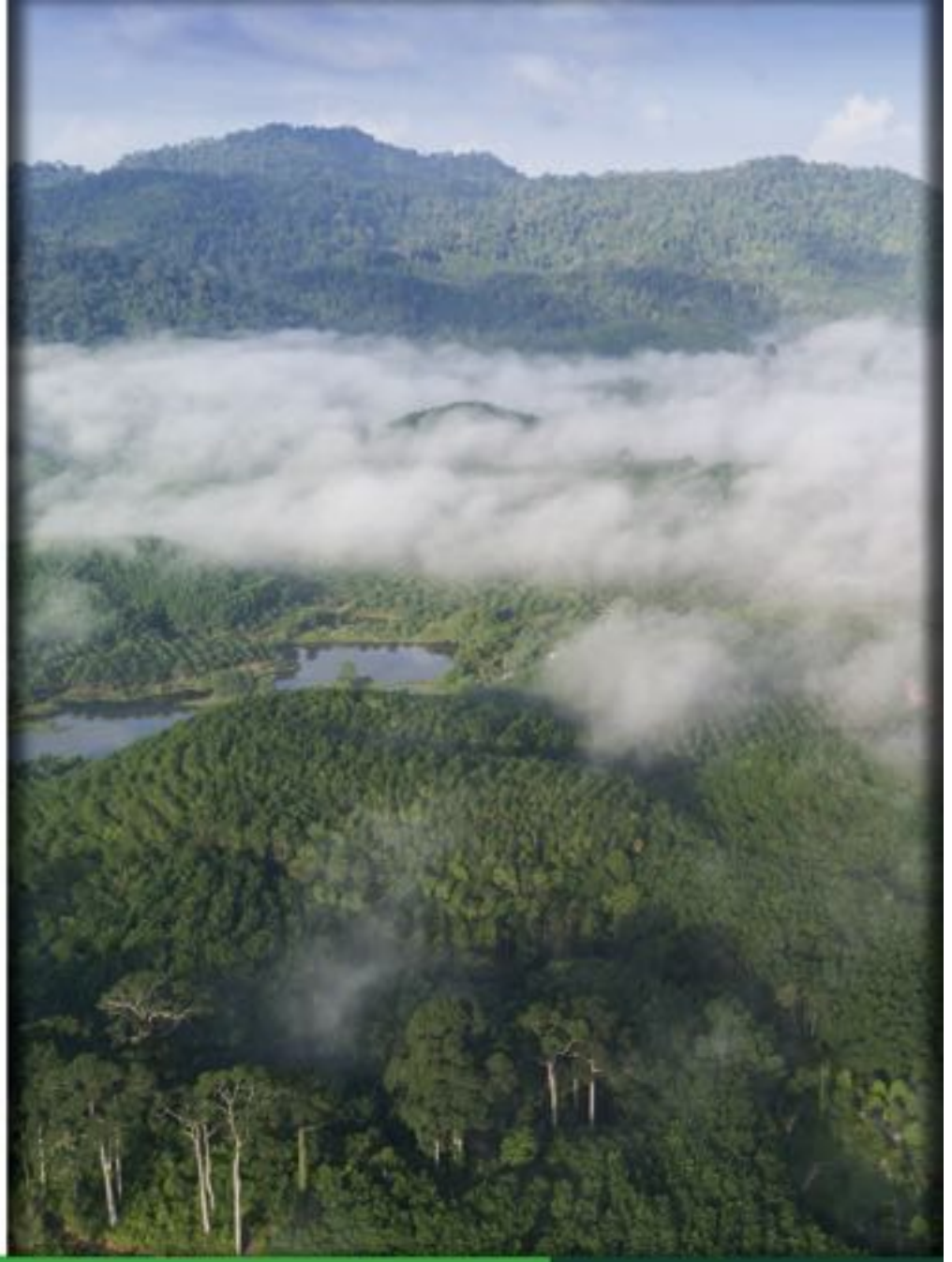
Regencies/cities	Plantation areas and type of crops managed/cultivated by smallholders									
	Sugar Palm	Clove	Cacao	Rubber	Palm Oil	Coconut	Candlenut	Coffee	Pepper	Others
Kutai Kartanegara	42	28	1,000	26,167	18,849	2,884	48	172	1,423	6
East Kutai	34	27	2,746	10,472	17,111	1,031	259	172	303	5
Samarinda	22	0	47	1,715	1,833	113	296	46	31	4
Bontang	9	1	53	589	1,145	175	35	27	9	3
TOTAL	107	56	3,845	38,942	38,938	4,202	638	417	1,766	18

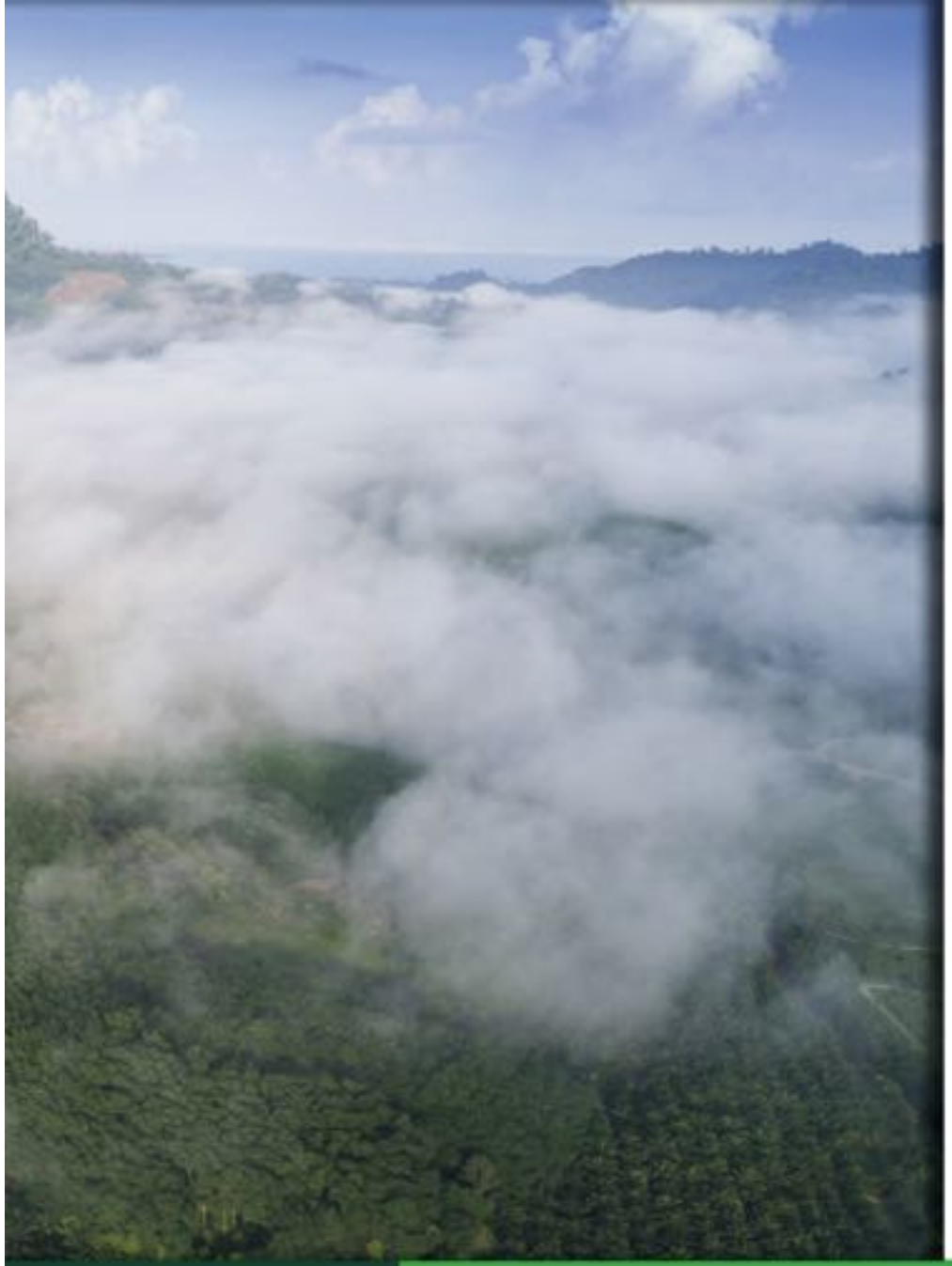
Source: Agricultual Census of East Kalimantan Province 2013 (Statistic of East Kalimantan 2014)

COST FOR A RUBBER PLANTATION PER YEAR

The Cost Estimate of Commodity Development Programs (Optional)

1. Farmer awareness for GAP (Good Agricultural Practices), US $ 120 per person per year
2. Construction of an urban farming demonstration plot for the differentiation of agricultural products, US $ 80 per person per year.
3. Integrated Farming Program (farming and fishery), US $ 650 per person per year.
4. Management program, US $ 1,700 per month.
5. Rubber replanting program, US $ 3,209 per hectare (50 seeds).





REFERENCES

Anonim.2018. Inilah 10 Negara Utama Tujuan Ekspor Karet Indonesia. https://databoks.katadata.co.id /datapublish/2017/11/30/inilah-10-negara-utama- tujuan –ekspor -karet-indonesia. Diakses 01-02-18 13:59

Anonymous.2017. Sektor Perkebunan, Salah Satu Program Bupati Menuju Pelalawan Emas. http://klikriau.com/m/read-25325-2017-06-02-sektor-perkebunan-salah-satu-program-bupati-menuju--pelalawan-emas.html#sthash.QPew457K.EkQsyvW2.dpbs. Diakses 26-01-18 12:03

Alby, Syahroni.2016.Harga Karet di Indragiri Hilir Stabil. https://www.antarariau.com/berita/73925 / harga-karet-di-indragiri-hilir-stabi. Diakses 24-01-2018 09:54

Anonymous.2017. Ratusan Ribu Hektare Kebun Karet di Jambi Tidak Produktif. http://www.beritasatu.com/nasional/448834-ratusan-ribu-hektare-kebun-karet-di-jambi-tidak-produktif.html

Belantara, Yayasan.2017.Panduan Yayasan Belantara: Rencana Pengembangan Konservasi di Area Hibah Target di Sumatera dan Kalimantan. Yayasan Belantara. Jakarta Pusat.

BPS.2002-2017. Jambi dalam angka 2002-2017.Badan Pusat Statistik.Jambi

BPS.2002-2017. Sumatra Selatan dalam angka 2002-2017.Badan Pusat Statistik.Sumsel

BPS.2009-2017.Kalimantan Timur dalam angka 2009-2017.Badan Pusat Statistik.Kaltim

BPS.2008-2016. Kalimantan Barat dalam angka 2008-2016.Badan Pusat Statistik.Kalbar

BPS.2008-2015. Riau dalam angka 2008-2015.Badan Pusat Statistik.Riau

Ipteknesia.2013. Sejarah Tanaman Karet. http:// www.ipteknesia.com /ristek/index.php? option=com_content&view=article&id=179:stk&catid=96:karet2&Itemid=497 . diakses tanggal 27-09-2017, jam 13.19

Kemenper, Dirjen industri agro. 2013. 5 negara produsen karet terbesar dunia. http://agro.kemenperin. go.id/1567-Ini-5-Negara-Produsen-Karet-Terbesar-Di-Dunia. Diakses tanggal 27/9/17 jam 14.13

Kementrian Pertanian, Dirjen Perkebunan.2016. Buku Statistik Perkebunan Indonesia: Karet 2015-2017. Kementan. Jakarta

Kontan.2016. Sumsel Target Peremajaan 1.600 ha kebun karet. http://regional.kontan.co.id/news/sumsel-target-peremajaan-1600-ha- kebun-karet. Diakses tanggal 17-01-2018, jam 16.18.

Setyamidjaja, Djoehana.1993.Seri Budidaya Karet.Penerbit Kanisius.Yogyakarta.

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