YAYASAN Belantara

CACAO 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.

CACAO
HISTORY & FACTS

Cacao (Theobroma cacao) is not a native plant of Indonesia but originated in Mesoamerica (now Central America) where it was used by the Aztecs and Mayans by crushing the cacao beans and mixing it with spices and water as offerings to elders, gods, and important ceremonies. Cacao was brought to Indonesia by the Spanish to Minahasa, North Sulawesi in 1560. Then in 1880, the Dutch experimented planting cacaos in their coffee plantations in Central Java Province and East Java Province. The initiation of cacao cultivation in Java Island at that time was done because of the Hemileia vastatrix epidemic attacks on existing coffee plantations.

In addition to palm oil and rubber, cacao has become one of Indonesia's leading plantation commodity and non-petroleum and non-natural gas product. Indonesia is the third largest cacao producer in the world after Ivory Coast and Ghana. Cacao plantations in Indonesia have contributed nationally as a source of employment and sources of foreign exchange. In 2002, cacao plantations were the source of income for 900 farmers in eastern Indonesia. Cacao is the nation's largest foreign exchange source after rubber and palm oil, valued at US $ 701 million. In the last 20 years, cacao plantations have grown rapidly, especially in the cacao production centers in South Sulawesi Province, Southeast Sulawesi Province, Central Sulawesi Province, and state plantations in East Java Province and Central Java Province. Nevertheless, Indonesian cacao agribusiness is still experiencing various complex difficulties such as low productivity due to pest attacks, low product quality and the development of cacao downstream products that are not yet optimum (Ministry of Industry, 2007).

As one of the world's three largest cacao producers after Ivory Coast and Ghana, the government is focusing on downstream industry prospects for cacao-based product development and is no longer exporting raw cacao materials as cacao export commodities. In addition, Indonesia has also implemented a Customs Export Policy of Cacao Beans to support the downstream industry. An indication of the cacao industries response in the implementation of this policy is attested by the growth of cacao processing industries in the country and the entry of foreign investors into Indonesia.

THE ECONOMICS OF INDONESIAN CACAO PRODUCTION

The increase of productive cacao plantation areas in the last ten years is an indicator of the cacao commodities growth in Indonesia, at which point the area of cacao plantations was 914,051 hectares in 2012, and grew to 1,701,351 hectares in 2015 and is still progressing for future development and expansion. According to the Ministry of Industry of Indonesia, the area of cacao plantations in Indonesia in 2007 was 992,448 hectares, and the cacao bean production per year that year reached 456,000 tons, with an average productivity of 0.9 tons per hectare.

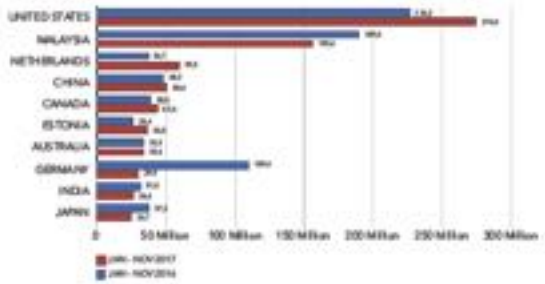
Indonesia also imports cacao for its national needs. Although data from The Directorate General of Plantation showed a decrease of cacao plantation areas in 2014, (1.727.437 ha, with a total production of 728,414 tons) compared to 2015 (1,701,351 ha with a total production of 593,331), Indonesia has also managed to decrease it's cacao import from 139,990 tons valued at $ 469.005 million to 84,438 tons valued at US $ 293,780,000 in the following year (2015). Besides that, cacao exports also increased the following year, from 333,679 tons worthing US $ 1.244,530 billion in 2014 to 355,321 tons, valued at US $ 1.307,771 billion in 2015. This shows that the increase in export did not correlate to the number of cacao plantation areas, but was possible by improving the export quality of cacaos. (Processed from The Plantation Statistics of Indonesia, Cacao Commodity 2015-2017, Directorate General of Estate Crops 2015-2017)

Cacao has the best export revenue percentage throughout 1980-2010 (+ 20%) compared to palm oil (+ 15%) and coffee (+ 1%). If comparing potential net income, cacao ranks second after coffee and better than palm oil. The net income potential of cacao is between US $ 750 - US $ 1,120 per ha/year in the 3-5 years stage of planting to harvesting and achieves a positive cash flow (Indonesia Business Case for a Sustainable Coffee Program, 2014).

Cacao producing areas in Indonesia are South Sulawesi Province (28.26%), Central Sulawesi Province (21.04%), Southeast Sulawesi Province (17.05%), North Sumatra Province (7.85%), East Kalimantan Province (3.84%), Lampung Province (3.23%) and other areas (18.74%).

Based on ownership/management, the types of cacao plantations in Indonesia are smallholders (887,735 ha), state plantations (49,976 ha) or private plantations (54,737 ha).

According to data from the Ministry of Commerce below, along the January-November 2016 and January-November 2017 period, Indonesia exported cacaos to 10 destination countries, which are the United States, Malaysia, Canada, Australia, Netherlands, Estonia, China, Mexico, Germany, and India.



CACAO
CLIMATE AND TYPES

Climate

Cacao grows well at an altitude of 0-600 meters above sea level and is suitable within the 10th parallel north - 10th parallel south of the equator. Cacao requires rainfall of 1500-2500 mm/year with three months of dry month (<60 mm). The maximum temperature for productivity and growth is between 30-32 ° C, with a minimum temperature of 18-21 ° C. The type of soil required to plant cacoa is mineral soil, with the slope being <45% and a tillage depth of 150 cm.

TYPES OF CACAOS

1.CRIOLLO

Criollo Cacaos are first-class cacaos and are considered to be the highest quality cacaos. Criollos cacaos are also known as noble cacaos, choice cacaos, edel cacaos and fine flavor cacaos. They are known for their rich and intricate aromas. Even so, Criollo cacaos have several weaknesses in its growth. They are less robust, have lower production, low fruitful period and is sensitive to pest and disease attacks. The shape of a criollo's pod tip is pointy and slightly crooked. It contains 30-40 seeds that are somewhat rounded, and the endosperm is white. The color of the pod is red when young and becomes orange colored when ripe. The fermentation process is very brief, and the taste is not too bitter.

2.FORASTERO

Forastero cacaos are bulk cacaos and are considered to be low-quality cacaos. Forastero cacaos are capable of high production, resilient to pests and diseases, and have a shorter period of conception. The skin of the pod is quite hard with a somewhat smooth surface. The color of the endosperm is dark purple and it is flat shaped. Forastero cacaos require a more extended fermentation period to bring out its flavor. Forastero cacaos are mostly hybrid bred with other cacao varieties.

3.TRINITARIO

Trinitario cacaos are high-quality cacaos and produce fine flavor quality seeds. The Trinitario is produced by naturally cross-breeding Criollo and Forastero cacao varieties, because of this, the Trinitario is genetically heterogeneous. The growth of Trinitaro cacaos is fast and has a brief fermentation period. It provides the best characteristics of the Criollo and the Forastero variety; the high-quality flavor that comes from Criollo and the high production and resistant against the Vascular Streak Dieback (VSD) disease that come from Forestero. The pod of Trinitario cacaos vary in shape and are mostly red or yellow colored.

GEOGRAPHIC AND CLIMATE INFORMATION

5 PROVINCES WHERE THE ECOSYSTEMS ARE SPREAD

GEOGRAPHIC 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

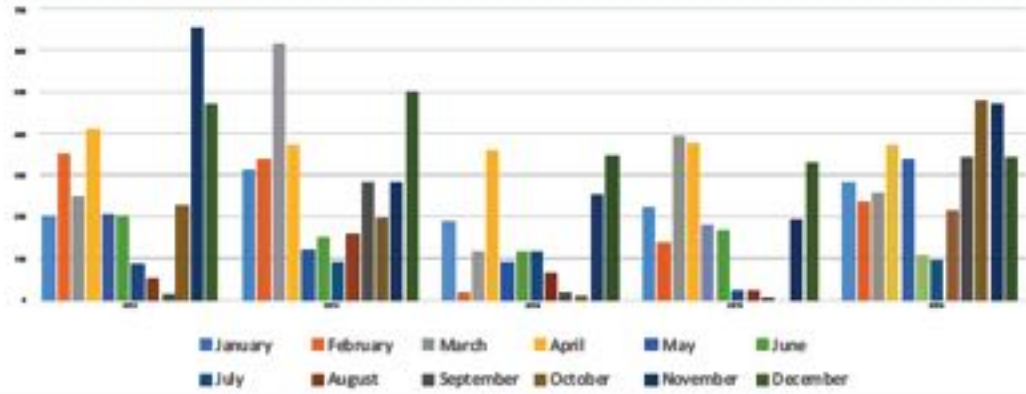
South Sumatra consists of eleven types of soils, namely:

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

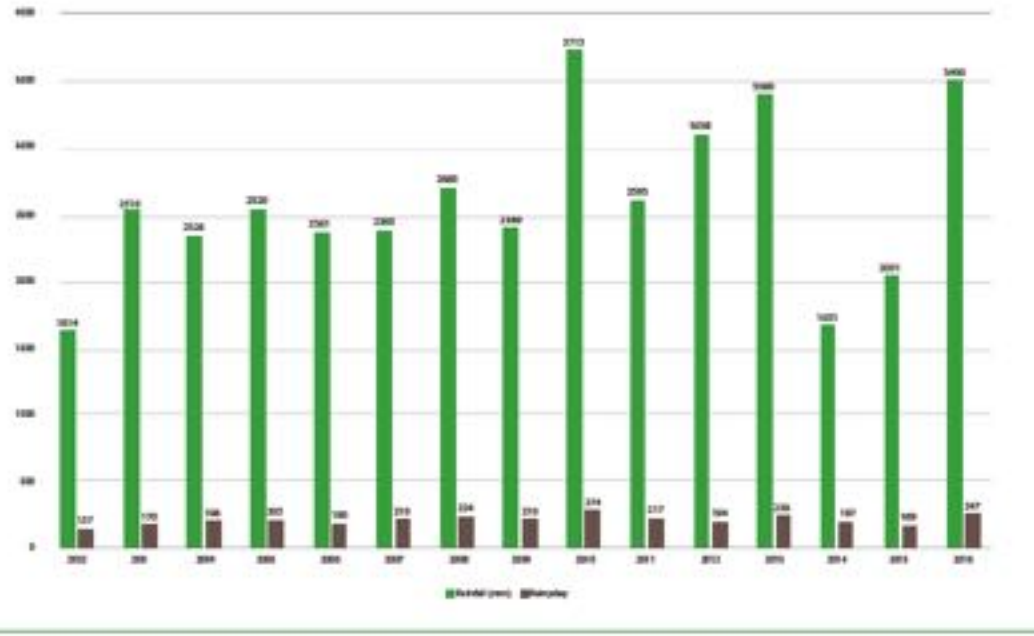
The annual rainfall graph of the last 5 years

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



GEOGRAPHIC 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.

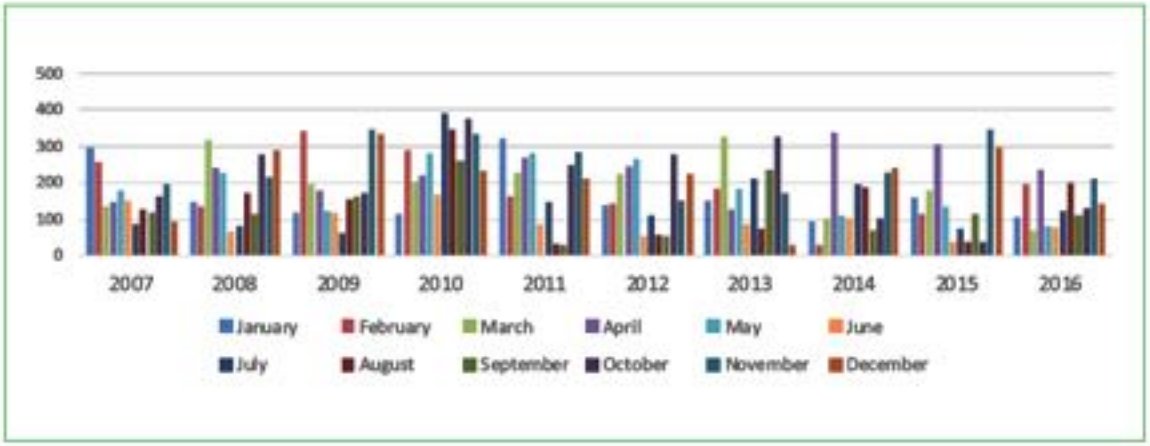
c. Highland : Dry highland that is dominant with plateus on the western part. Fertile alluvial soil could be found in the central parts of Kerinci Regency.

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**

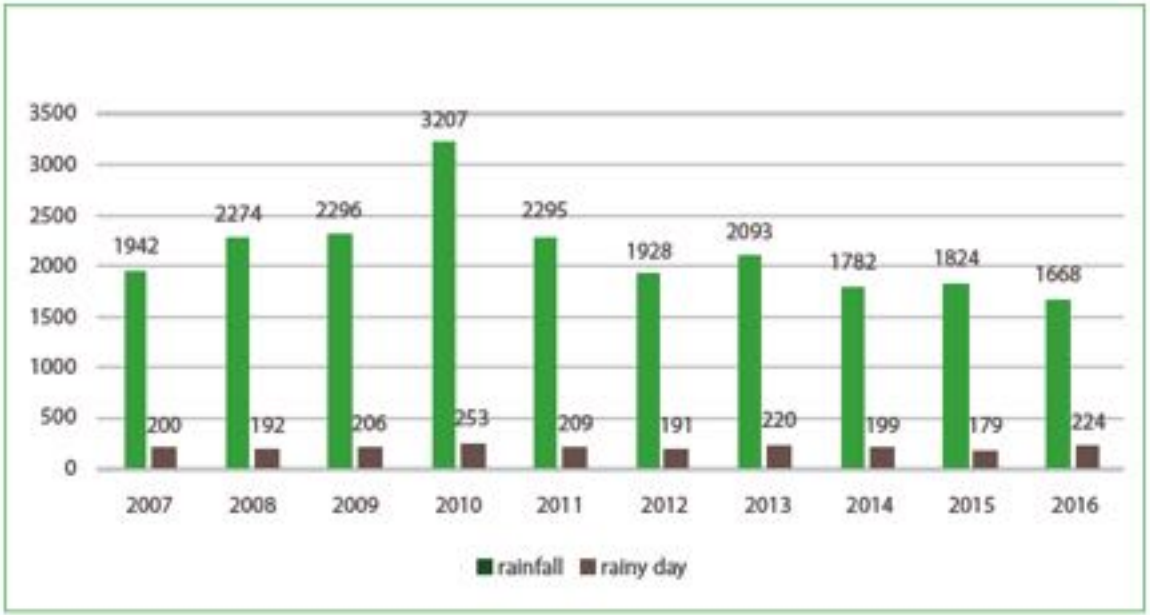
Source: RTRW of Jambi City Cit RPJMP Jambi 2011-2015

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

GEOGRAPHIC 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.

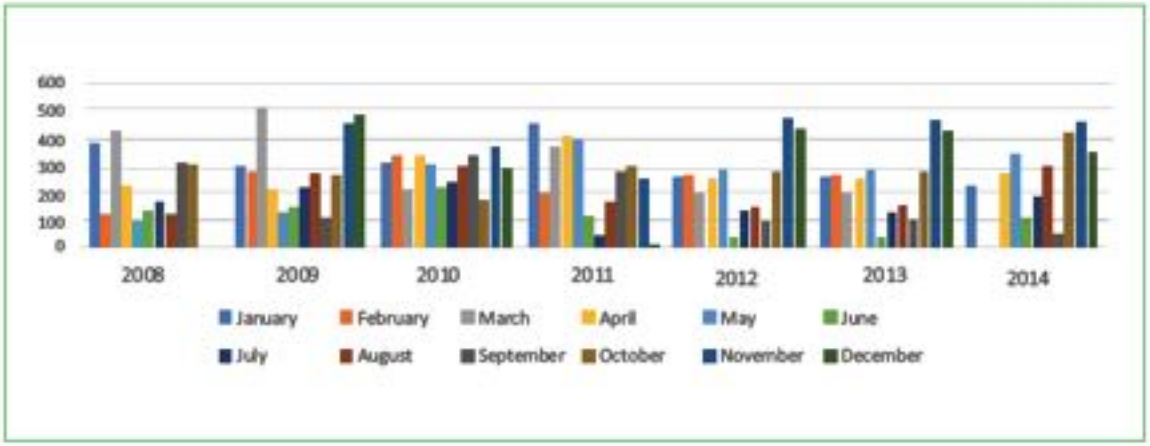
a. 1. Lowlands

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

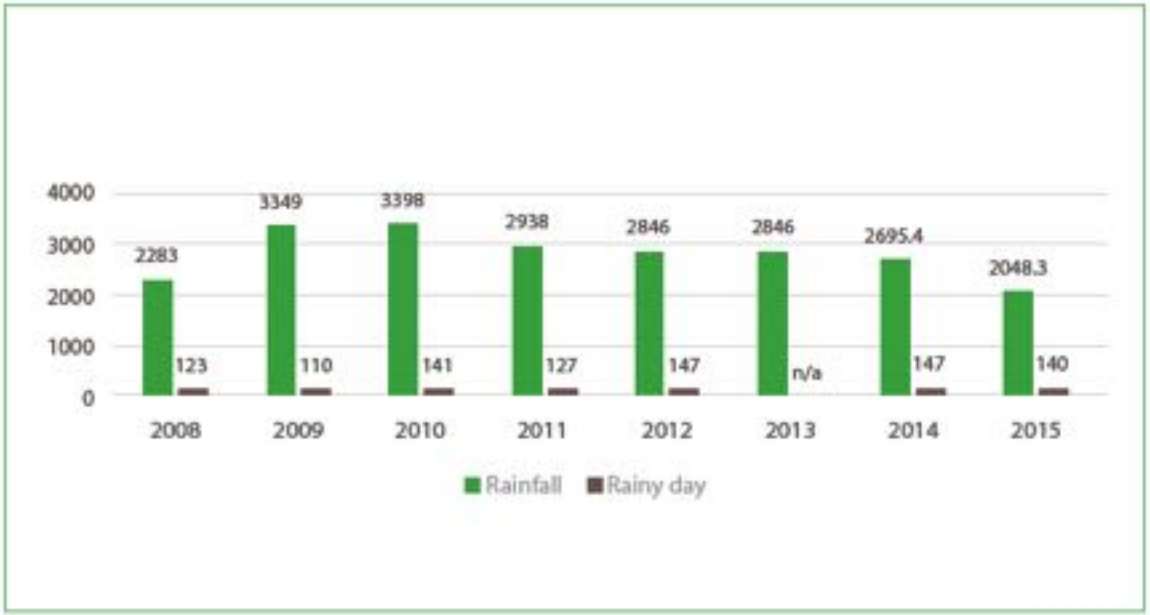
No.	Soil Type	Area	Rock Form	Physiography
1	Podzol	209,600	Sedimentary rock	Flatland
2	Red-Yellow Podzolic	-	Sedimentary Rocks dan Igneous Rocks	Foldland
3	Red-Yellow Podzolic (Complex)	218,200	Igneous Rocks	Intrusion
4	Red-Yellow Podzolic Latosol and Litosol	94,800	Igneous Sedimentary Rocks and Metamorphic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

GEOGRAPHIC 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

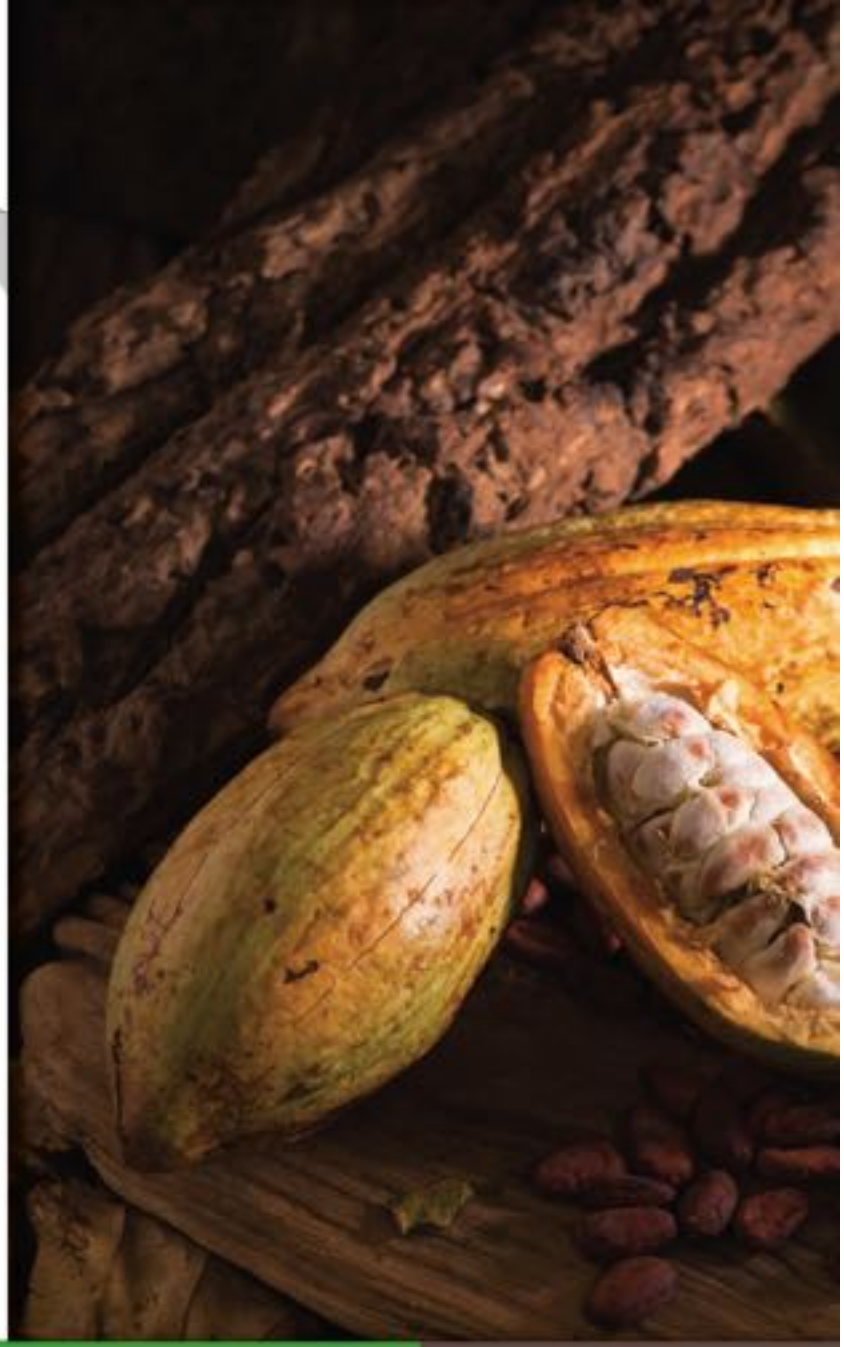
Based on its soil texture most of West Kalimantan Province consist of red-yellow podzolic soil (RYP), which spread over 10,5 million hectares or 71.28% of West Kalimantan Province. Furthermore, its soil also consists of OGH soil (organosol, gley humus) and alluvial soils, which amounts to 10.29% of West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

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

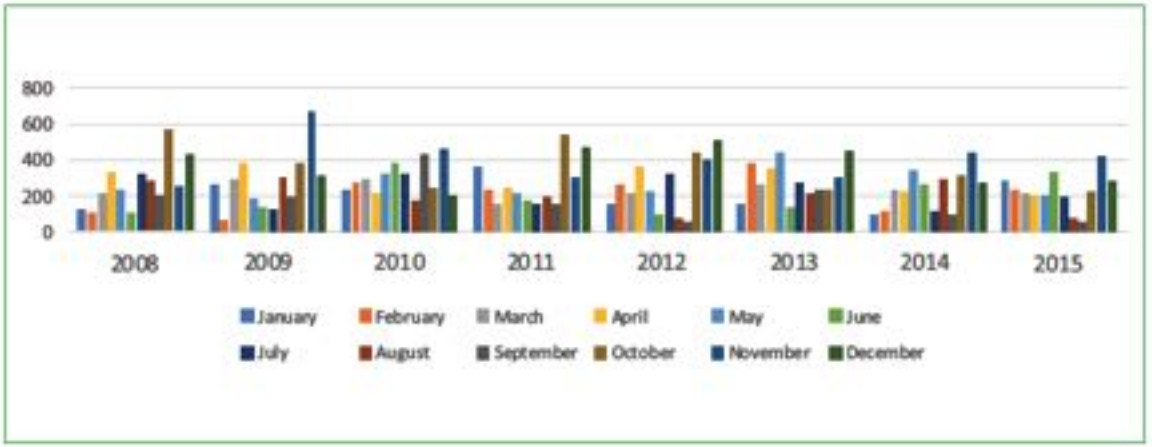
No.	Regency/City	OGH	Alluvial	Regosol	PMK	Podzol	Latosol
1	Landak Regency	138,152	323	0	761,014	49,621	41,600
2	Pontianak Regency	3,140	56,703	0	36,148	32,329	0
3	Kubu Raya Regency	170,584	462,437	0	33,765	25,468	6,266
4	North Kayong Regency	127,840	197,966	0	57,803	73,217	0
5	Pontianak City	3,600	7,180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

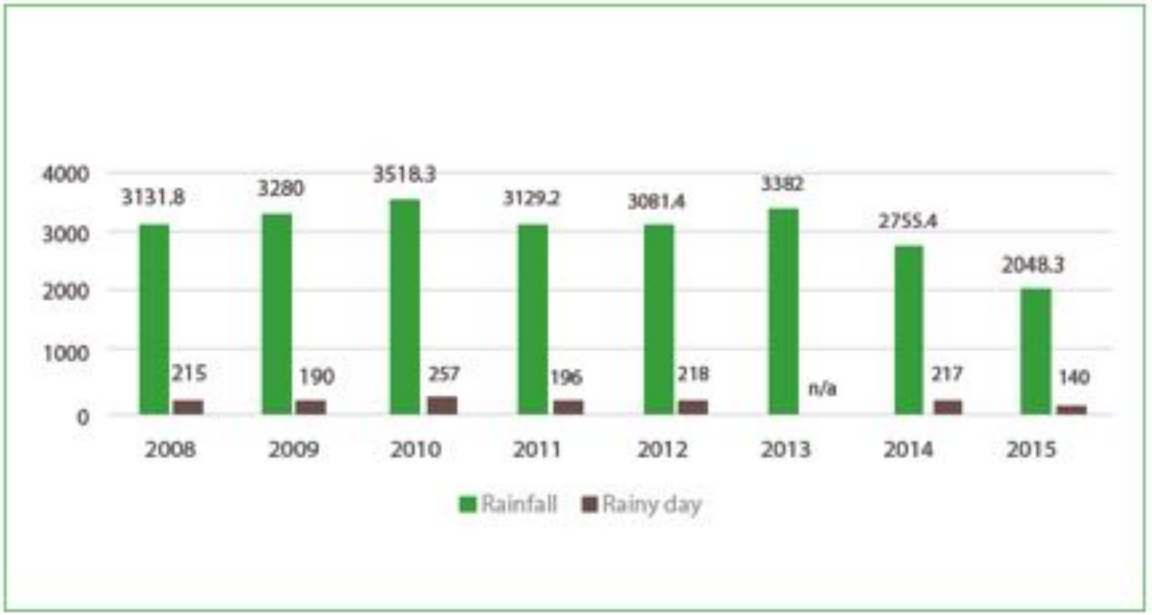


b. Climate



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

GEOGRAPHIC AND CLIMATE INFORMATION OF EAST KALIMANTAN PROVINCE

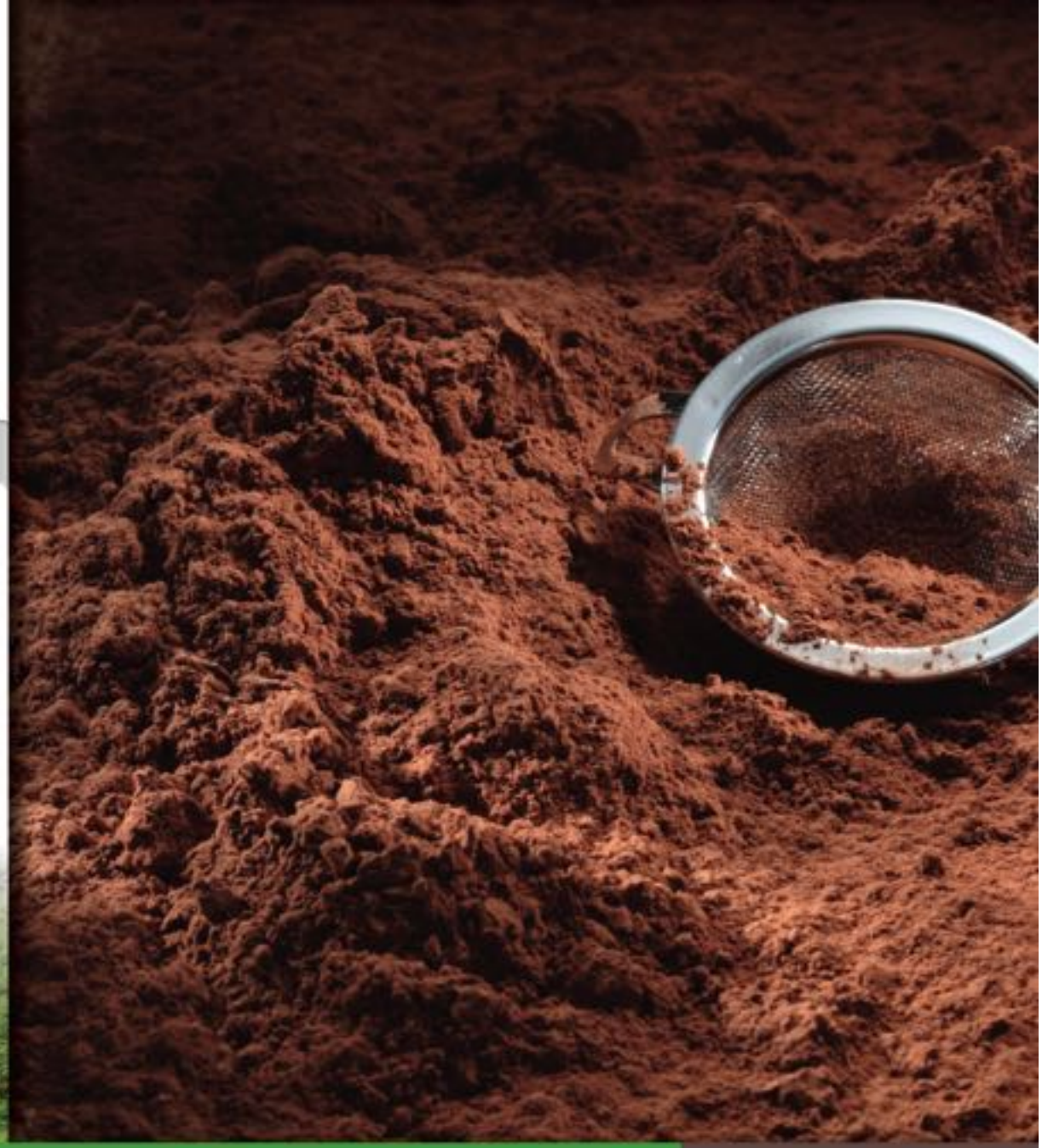
Source: Central Bureau of Statistics, East Kalimantan Province (2009-2016)

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

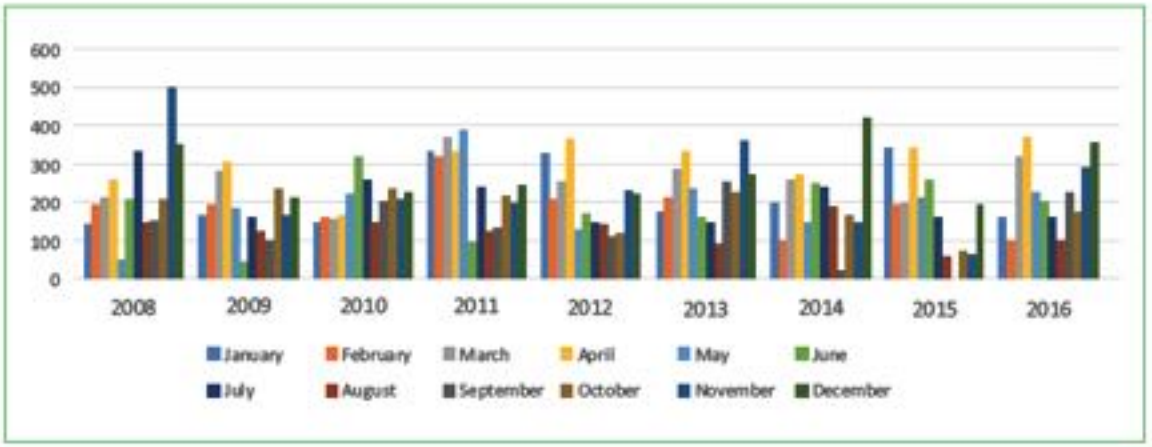
Land condition of East Kalimantan Province

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 CACAO

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

1. The Padang Sugihan Ecosystem (Suitable for Cacao Plantations)

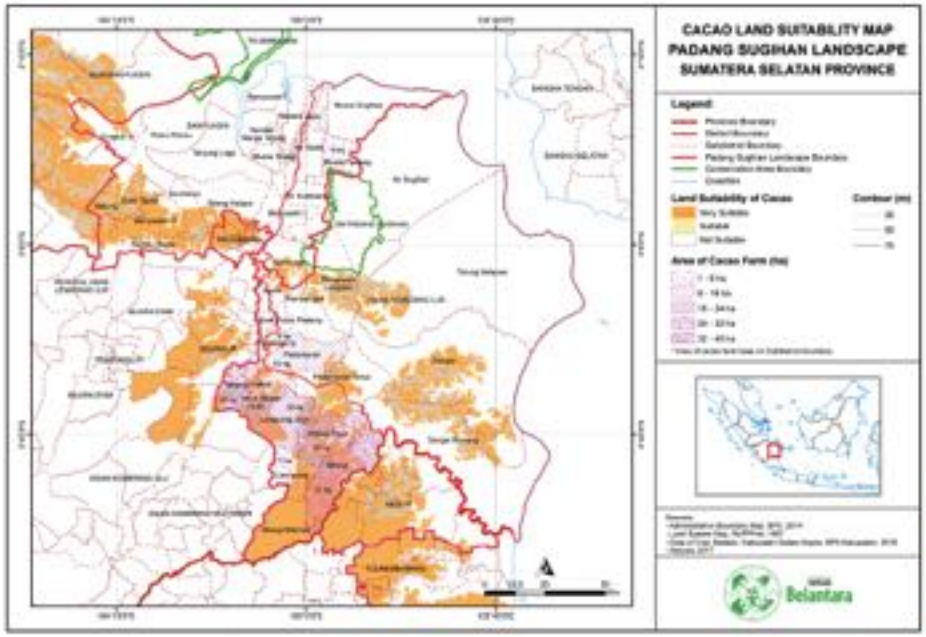


Figure 1. The Map of Land Suitability for Cacao and Areas of Cacao Farms in the Padang Sugihan Ecosystem

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

In the Padang Sugihan Ecosystem, cacaos are one of the companion plants that a farmer cultivates in their yard and on the peripheries of the rubber and palm oil plantations. Farmers are reluctant to plant cacaos as their primary crop because cacao plants require intensive care to produce the best cacao beans. The culture of South Sumatran farmers that let their crop be and only tend as necessary is one of the leading obstacles to the spread cacao crops in South Sumatra Province, as it will affect the health of vulnerable plants, such as cacaos to be susceptible to pests and diseases. Cacao crops in the Padang Sugihan Ecosystem are only companion crops to the primary commodities and are likely planted by transmigrant settlers.

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: Through intensive assistance and monitoring, the Padang Sugihan Ecosystem has the potential to plant cacaos outside of the protected wildlife reserve area. It will be a challenge to provide assistance and guidance for existing cacao plants, and the best way would be to start with planting from scratch to provide a model that can be followed by the champions of the community.

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 - (Suitable for Cacao Plantations)

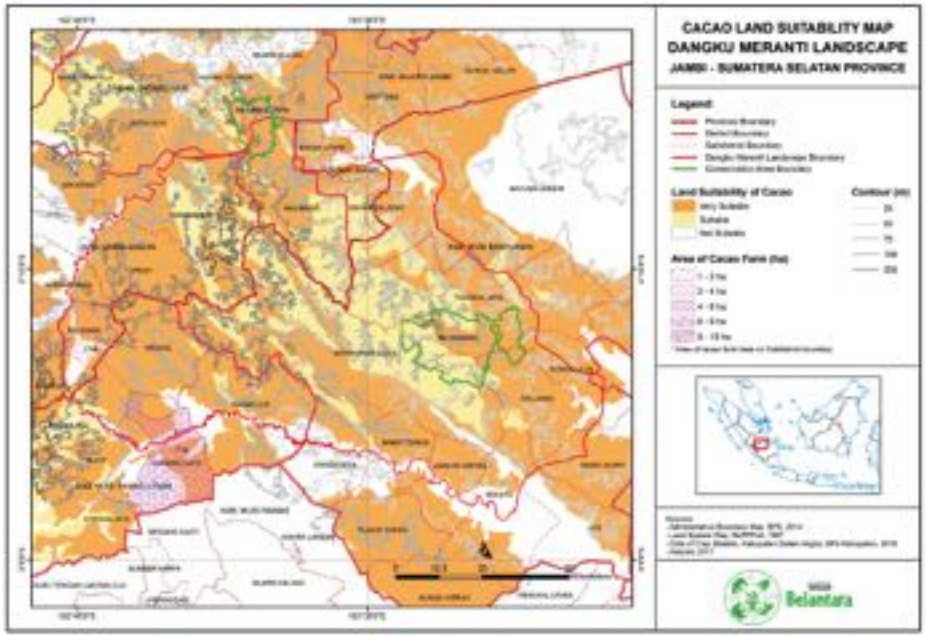


Figure 2. The Map of Land Suitability for Cacao and Areas of Cacao Farms in the Dangku Meranti Ecosystem

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

Areas around the Dangku Meranti Ecosystem are the central rubber and palm plantations of South Sumatra Province. Cacaos are only companion crops in this ecosystem. Each farmer group, as well as villages, only plant 2 - 50 cacao plants on the sidelines of their rubber trees. Although based on its microclimate and soil condition this ecosystem is very suitable to plant cacaos, the development of new cacao plantations in this ecosystem will be coming more from new land clearings or existing crop conversions.

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: As the average population grow rubber plants, the Dangku Meranti Ecosystem is one of the largest rubber commodity suppliers in South Sumatra Province. Although the land suitability analysis says that this ecosystem is suitable for cacaos, cacaos are not the main commodity grown in this ecosystem.

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 Cacao Plantations)

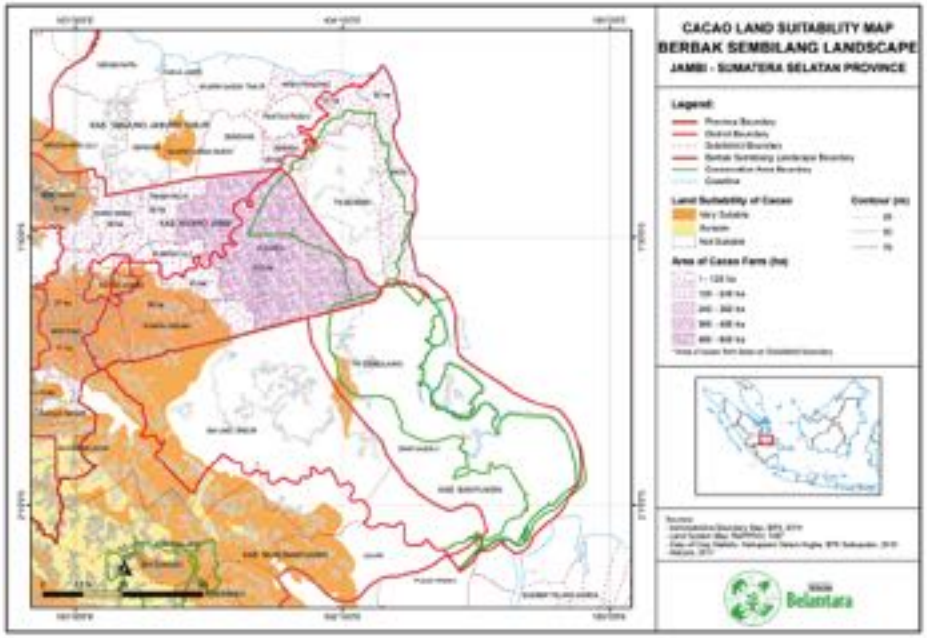


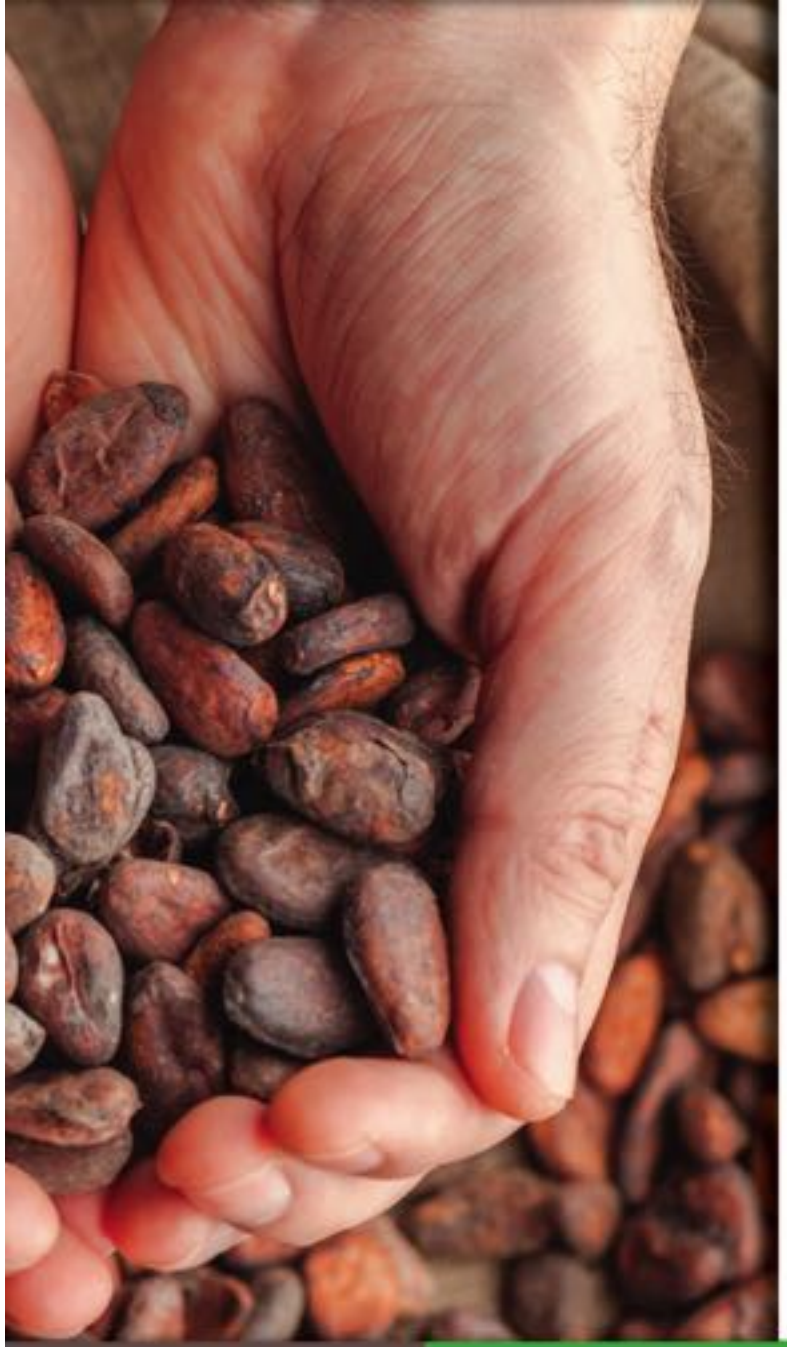
Figure 3. The Map of Land Suitability for Cacao and Areas of Cacao Farms in the Berbak Sembilang Ecosystem

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

The Berbak Sembilang Ecosystem is spread across South Sumatra Province and Jambi Province. Developing smallholder cacao farmers in the South Sumatra Province part of the Berbak Sembilang Ecosystem will be met with significant challenges because most areas in this part of the ecosystem are already planted with HTI (Industrial Forest Plantations) and rubber plantations.

In contrast to the South Sumatra Province Part of this ecosystem, the potential in developing to increase the capacity of smallholder cacao farmers in the Jambi Province part of this ecosystem, is still very viable, especially in Muaro Jambi Regency, specifically either in Sungai Gelam Sub-district or Kumpeh Sub-district. Even though the yield of cacaos in Kumpeh Sub-district per hectare is quite low (below 1 ton per ha), farmers in this district have made cacao their primary source of income.

Cacao plants in this ecosystem are mostly planted in Kumpeh Sub-district and are Forastero cacaos. The average age of cacao plants in Kumpeh Sub-district is 6-8 years.



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 South Sumatra Province part of the Berbak Sembilang has a more complex challange than the Jambi province part. The jambi Province part of this ecosystem has more potential in developing either new cacao plantations or for growing the capacity of exsisting cacao farmers.

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 Cacao Plantations)

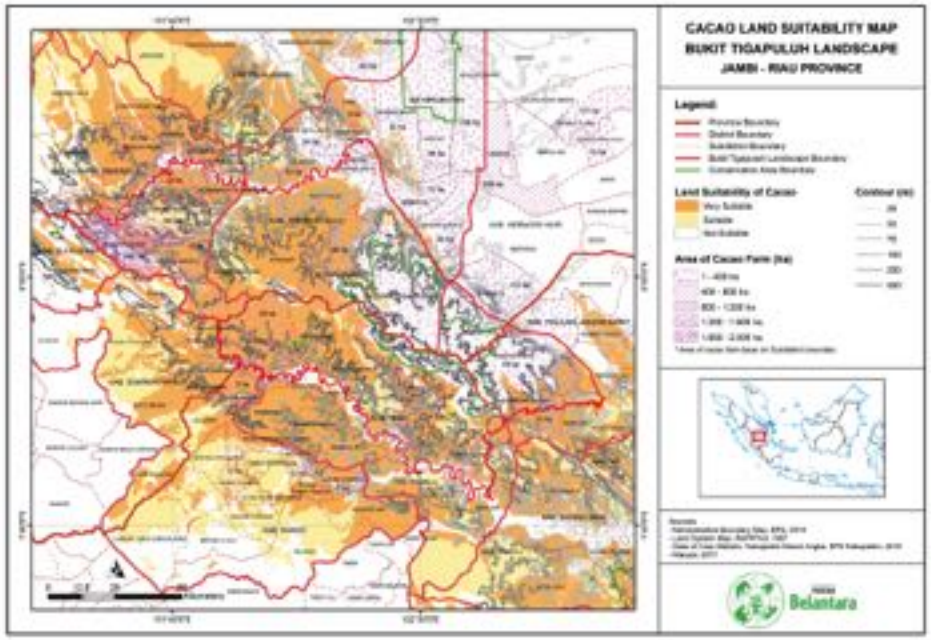


Figure 4. The Map of Land Suitability for Cacao and Areas of Cacao Farms in the Bukit Tigapuluh Ecosystem

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

Cacaos in the surrounding areas of Bukit Tigapuluh National Park both in Jambi Province and Riau Province has its history and own developmental characteristics. Investors have come and built integrated plantations, both in Riau Province and Jambi Province, such as PT. Tri Baktimas Sarimas's zero waste integrated palm oil, cacao and coconut plantation in Kuantan Singingi Regency, Riau Province.

In Jambi Province, cacaos are also planted among coconut plantations as intercrops by smallholder farmers. The sub-districts that are suitable for cacao plantations are Sinyerang Sub-district and Seberang Kota Sub-district (both in Jambi Province), where these two sub-districts do not experience floods that threaten the health of cacao crops.

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 (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: There is an oppurtunity to develop the cacao industry in the Bukit Tiga Puluh Ecosystem as a place for processing cacaos. Since, cacao plantations around the Bukit Tiga Puluh Ecosystem are currently scattered and not widely cultivated by smallholders compared to rubber and palm oil, the existence of downstream industries will stimulate the economic value chain of cacao within the ecosystem of Bukit Tiga Puluh and its surrounding areas.

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	47,825.25	36,668.14	288	10.15	0.05	8.62	0.13	0
Indragiri Hulu	0.26	533.94	46,810.77	79,434.38	262.05	14.94	0.01	183.84	0	0.5
Indragiri Hilir	5.3	93.1	3,939.32	91,178.64	210,107.10	468.58	0.17	10,055.61	1,108.09	18.89
Tanjung Jabung Barat	0	77.22	8,754.04	54,711.50	35,587.47	3,792.77	3.18	16,712.97	0	0
Tebo	0.77	317.52	109,203_3	28,019.47	189.31	27.17	0.18	7.16	0	0
Bungo	6.27	214.69	70,753.80	34,655.78	134.2	488.63	0	10.48	0	0
Total areas (ha)	19.61	1,385.74	296,386.90	294,468.91	246,568.54	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)

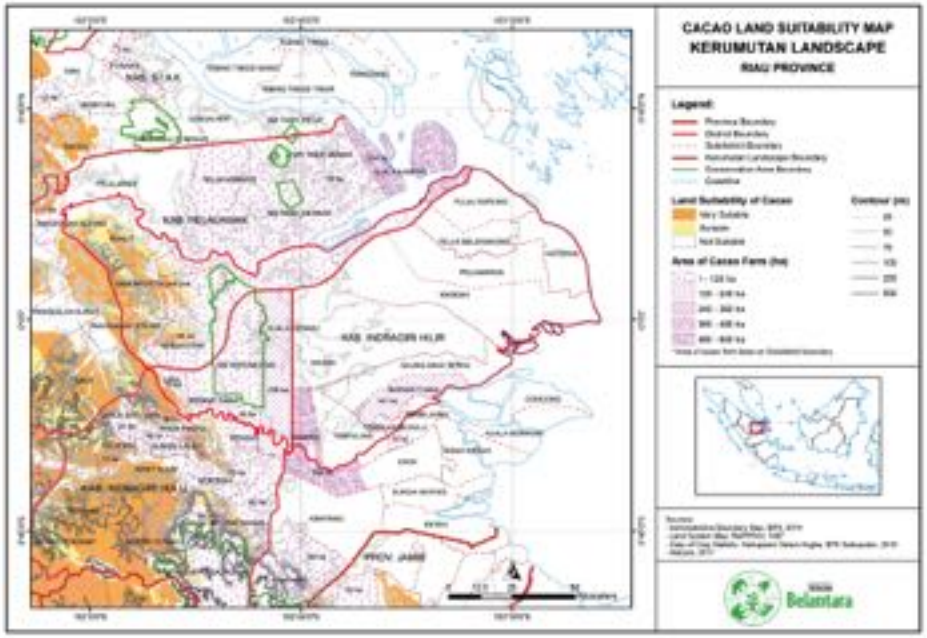


Figure 5. The Map of Land Suitability for Cacao and Areas of Cacao Farms in the Kerumutan Ecosystem

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

Cacao plants around the Kerumutan Ecosystem grow and compete with rubber, coconut and palm plantations. However, in some regencies, cacaos have become the commodity of choice because of its stable price and its tendency to rise in price. For example in Indragiri Hilir Regency, because of the fluctuating prices of their primary commodity, coconuts, and the steady rates of cacaos, farmers also grow cacaos as their primary commodity after coconuts as a buffer when coconut prices are low.

Capacity building, such as the development of GAP (Good Agriculture Practice), simple fermentation technologies, simple greenhouses, and downstream processing are some of the initiatives that can be done to develop the community's capacity to increase the income of cacao farmers in the Kerumutan Ecosystem

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: Even though cacaos around the Kerumutan Ecosystem has become one of the primary commodities, the community around this ecosystem has not cultivated cacao as their main commodity. Increasing the capacity of post-harvest knowledge and facilities is essential for cacaos in this ecosystem can compete for quality.

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 – (Not Suitable for Cacao Plantations)

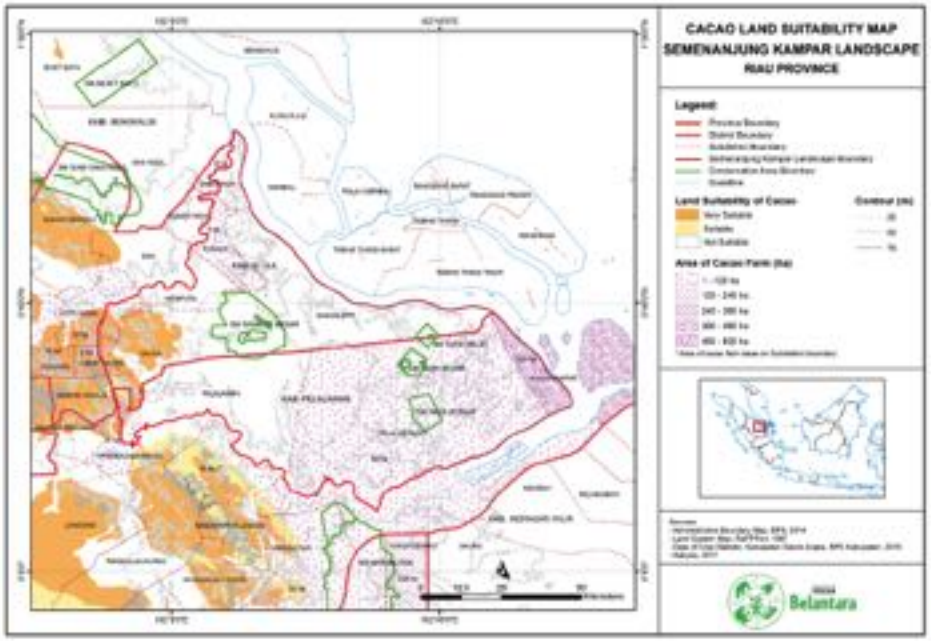


Figure 6. The Map of Land Suitability for Cacao and Areas of Cacao Farms in the Kampar Peninsula Ecosystem

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

Even with imperfect land conditions, the existence of cacao plants in the Kampar Peninsula Ecosystem is inseparable from the extensive regional support for cacao and coffee commodities. This is evident from the development of cacao and coffee plantations in Kuala Kampar Sub-district where the aid given for coconut rejuvenation in the farmer's plantations is also accompanied with the provision of cacao saplings. In Pelalawan Regency there are also farmers growing cacaos independently and plant the cacaos alongside with coconuts.

Although the land conditions are not ideal for farming cacaos, the farmers are quite helped by cacao harvests when the cocoa prices are low, even though some are harvesting cacaos below 1 ton per hectare..

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: Despite the unsuitable land conditions, the development of cacao plantations in the Kampar Peninsula Ecosystem flourishes thanks to the support given by Pelalawan Regency's government. In Kuala Kampar Sub-district, farmers that plant cacaos along with their primary commodity (coconuts) helps them financially and acts as a buffer when the voilatile prices of coconuts fall.

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 Cacao Plantations)

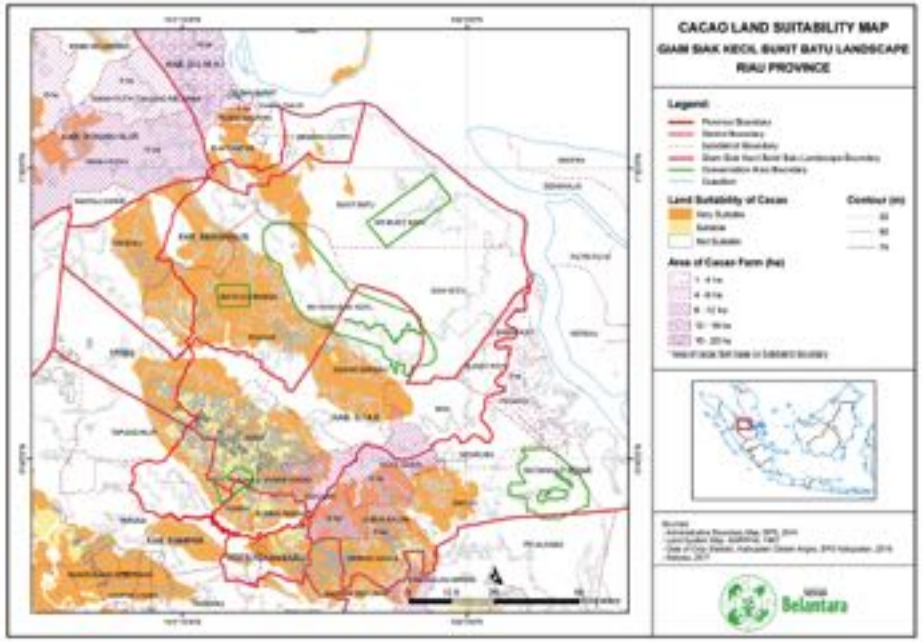


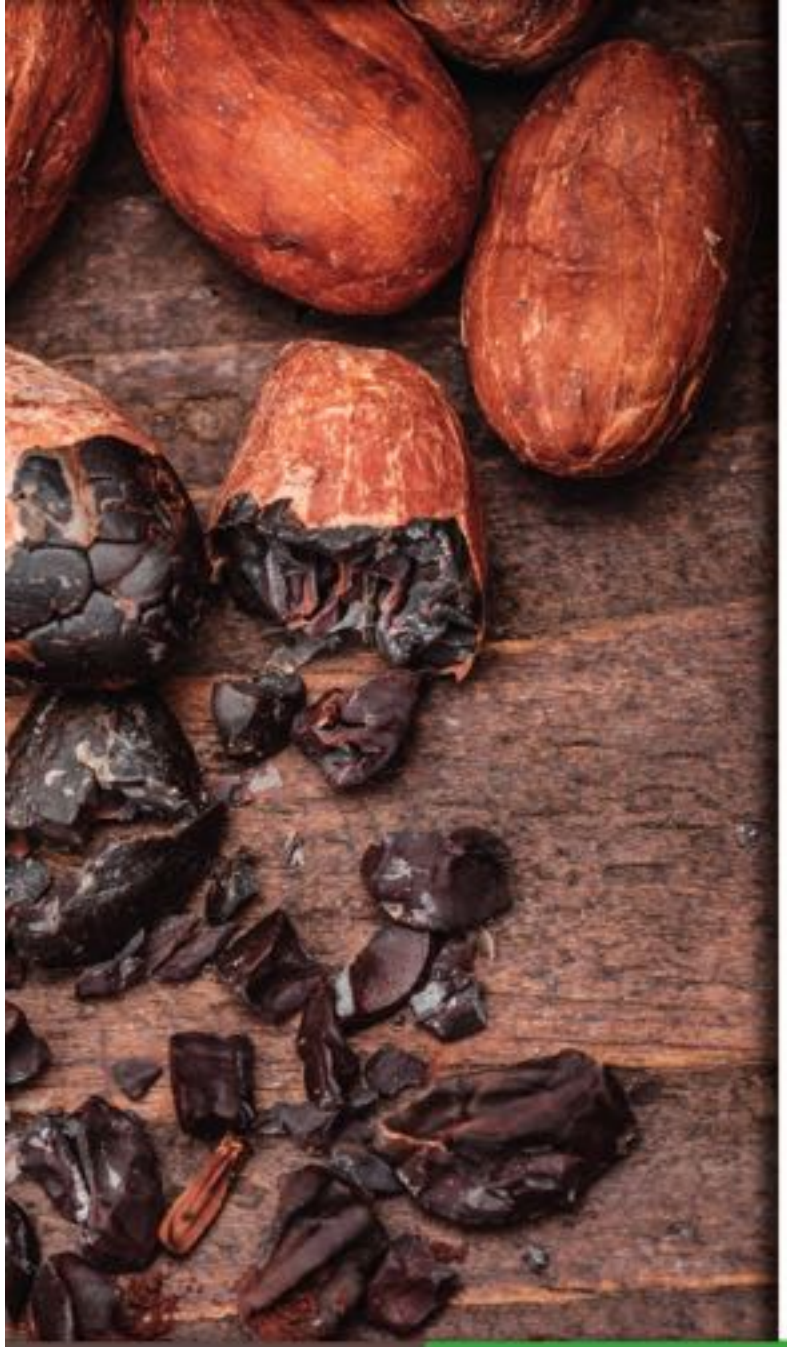
Figure 7. The Map of Land Suitability for Cacao and Areas of Cacao Farms in the Giam Siak Kecil Bukit Batu Ecosystem

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

There are only a few areas of cacao plantations in the Giam Siak Kecil Bukit Batu (GSKBB) Ecosystem. Both the communities who live within and outside of the protected areas of this ecosystem prefer to grow palm oil rather than cacao. The dominance of palm oil plantations is due to its suitability and ability to produce maximum yields in this ecosystem. There are pressures into the protected areas of this ecosystem that is caused by increasing revenues from palm oil plantations and has been a particular concern in the monitoring of protected areas. Although cacaos can potentially be planted in Bengkalis Regency and Kampar Regency, it would be a challenge to convince the communities in these regencies to plant cacaos as a viable alternative to palm oil or grow the cacao crops as intercrops or alongside palm oils in their plantations.

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: There will be several constraining factors in finding and developing existing cacao plantations in the GSKBB ecosystem. such as the small amount of cacao plantations areas and the communites perception that cacaos are not yet considered as a viable commodity compared to palm oils. These factors can potentially increase the cost of investment for development programs.

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 Cacao Plantations)

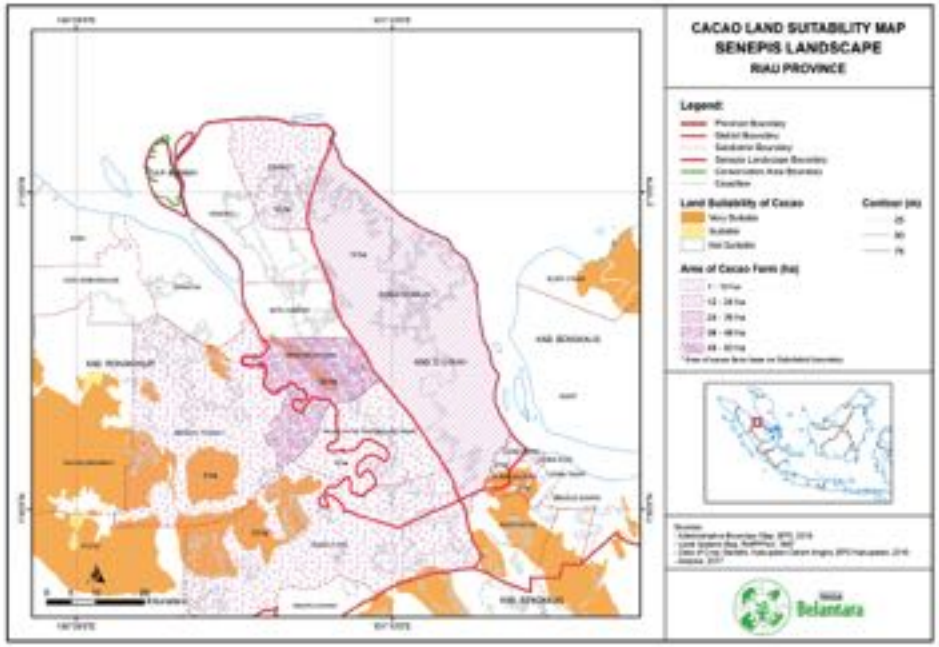


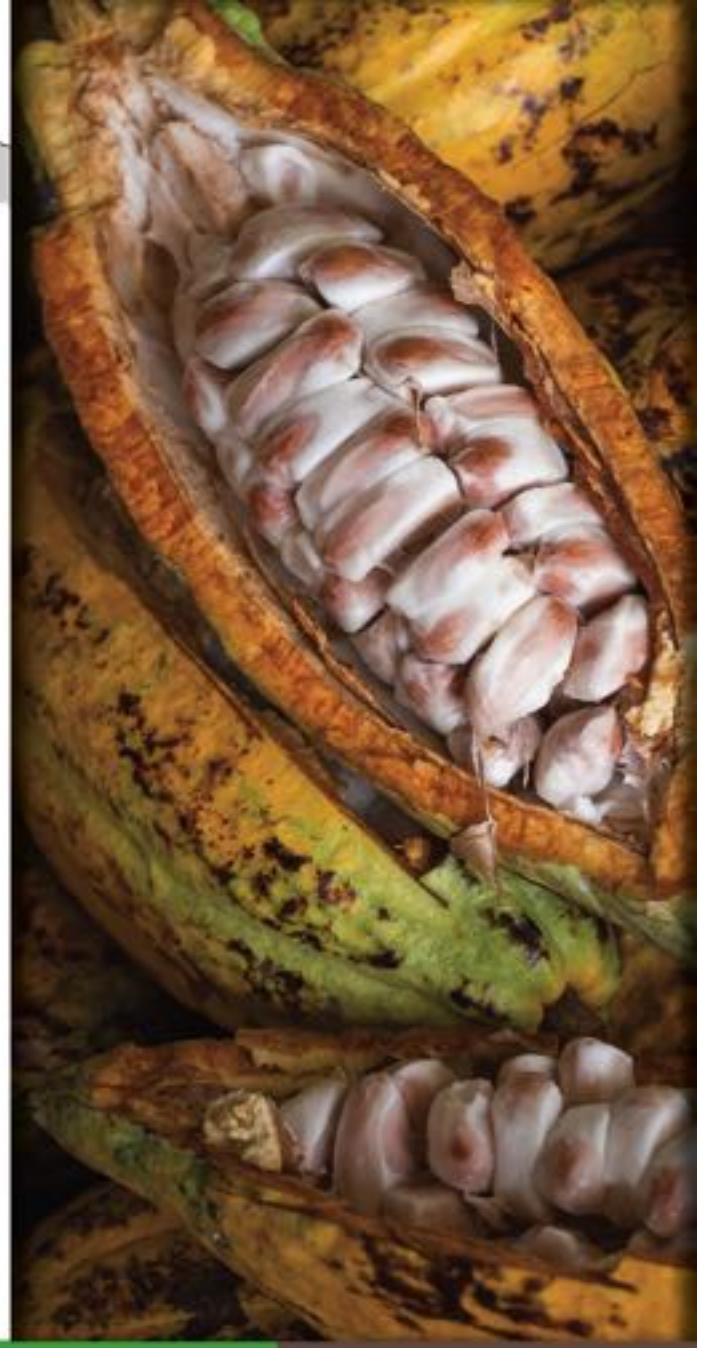
Figure 8. The Map of Land Suitability for Cacao and Areas of Cacao Farms in the Senepis Ecosystem

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

In the Senepis Ecosystem, palm oil is the primary commodity and is reflected by the many palm oil plantations that exist in this ecosystem. Besides just growing palm oils, the community also grows companion crops, such as coarse grains, pulses, and roots and tuber crops as intercrops alongside their palm oil plantation. Some farmers also open rice fields on unused land and plant it with coconuts for its copra along with other companion crops.

The continuous demand for coconuts by intermediaries and collectors that supply the coconut industry is the reason that for the people in this ecosystem to keep maintaining their coconut trees. Although cacao is not the primary crop in this ecosystem, there are quite a lot of cacao plantations in Rimba Melintang Sub-district, an area suitable for cacaos.

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: Cacao is not the primary crop grown in the Senepis Ecosystem. However, there is an opportunity to grow cacaos in Rimba Melintang Sub-district, an area with suitable land conditions and where much of the cacao trees in this ecosystem are planted.

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)

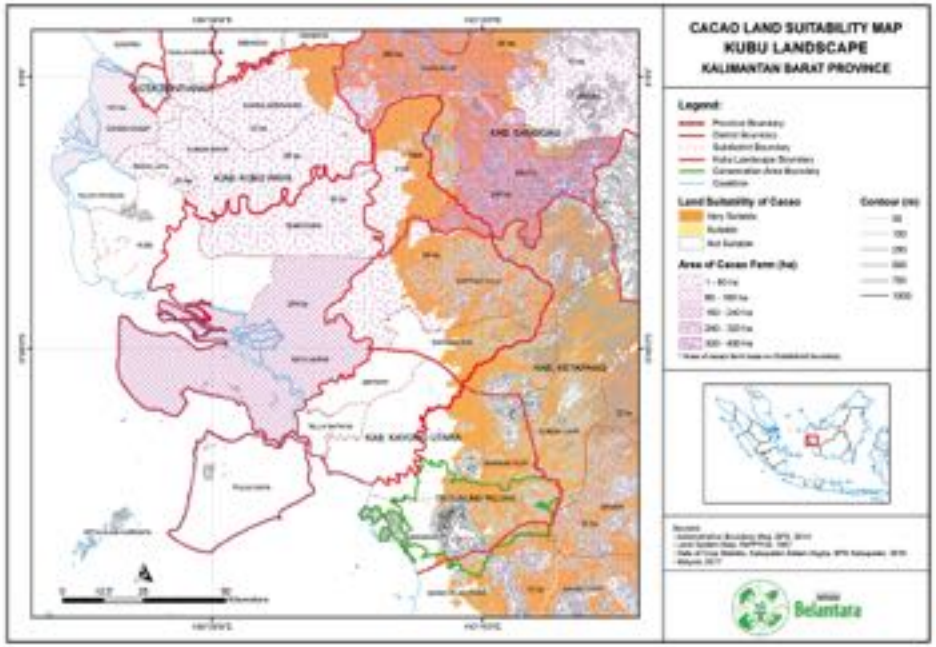


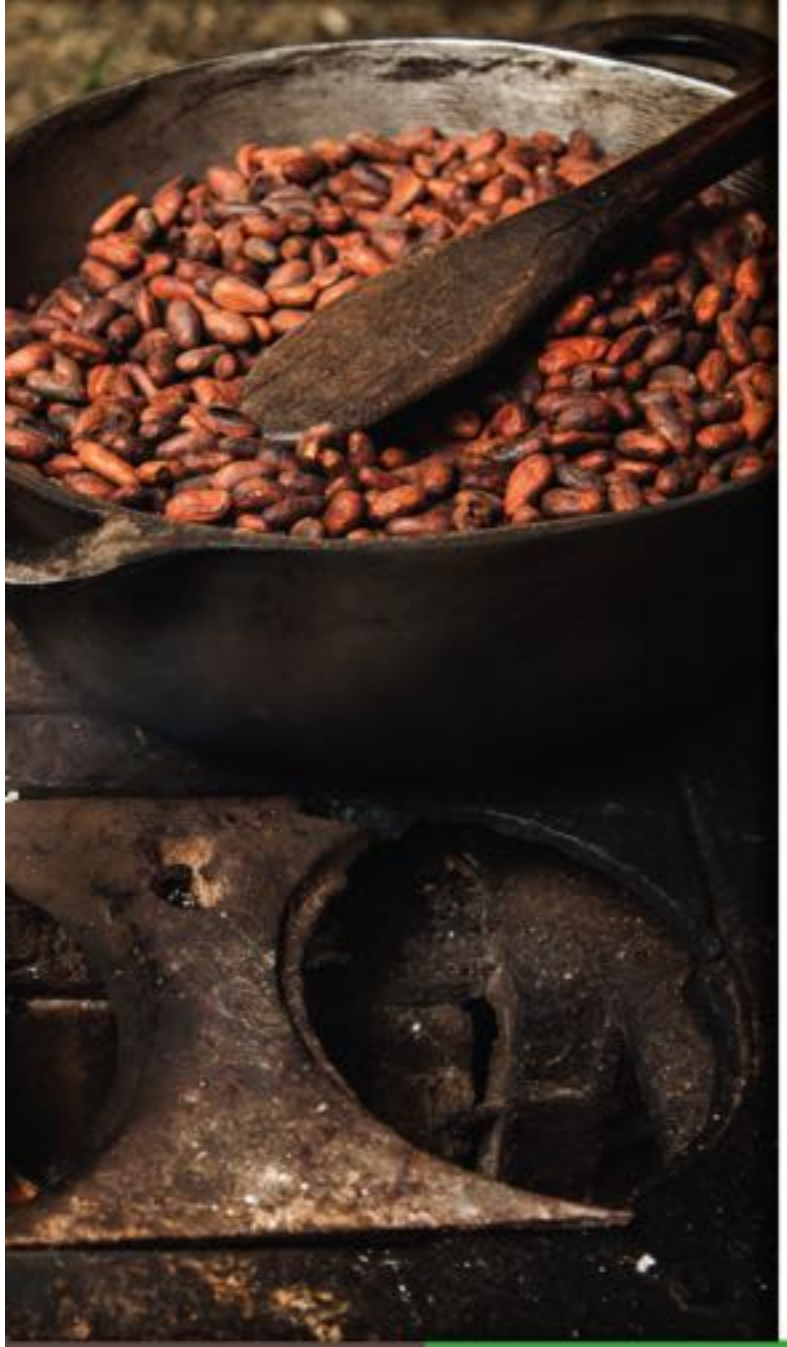
Figure 9. The Map of Land Suitability for Cacao and Areas of Cacao Farms in Kubu Raya Ecosystem

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

The Kubu Raya Ecosystem is potential for smallholder cacao plantations. In 2010, many cacao plants in Sanggau Regency were rejuvenated, covering an area of approximately 150 hectares. The rejuvenation replaced old cacao trees originated from Malaysia. Cacao plantations around the Kubu Raya Ecosystem, especially the ones in Sanggau Sub-district is prospective and very suitable for developing an increase in income for cacao smallholders, as well as expanding the small cacao processing industries capacity.

In West Kalimantan, there is a program called Gernas Kakao (a movement to increase the national production and quality of cacaos) by the government that aims at stimulating smallholder cacao farmers to improve their productivity with high-quality cacao seeds.

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: Not only is the Kubu Raya Ecosystem suitable for cacao plantations, the cacaos planted by smallholder farmers are also quite developed as a result of excellent government support by a cacoa rejuvenating program that replaces old cacao trees, and best agricultural practices.

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 Cacao Plantations)

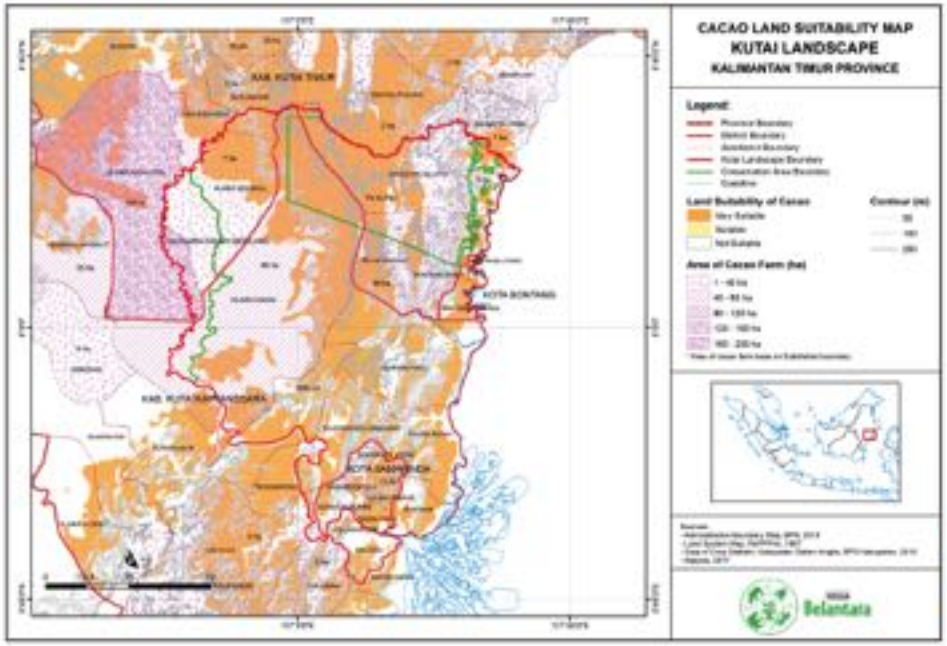


Figure 10. The Map of Land Suitability for Cacao and Areas of Cacao Farms in Kutai Ecosystem

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

Many cacao plantations in the Kutai Ecosystem, are cultivated in Teluk Pandan Sub-district, South Sangatta Sub-district, Muara Ancalong Sub-District, Rantau Pulung Sub-District, Muara Bengkal Sub-District, North Sangatta Sub-District and Batu Ampar Sub-district. There is also a large cacao plantation in Busang Sub-district, but that is outside of this ecosystem. The chocolate characteristics of cacaos around the Kutai Ecosystem is that it doesn't melt easily, because of this it can be used as a blending material.

Developing the potential of smallholders in East Kutai Province as a whole and the Kutai Ecosystem can be done through increasing awareness of cacao pest and disease and how to manage it; optimization of cultivation techniques with prime seeds; and also downstream cacao development by providing fermentation sites and downstream processing of cacaos. Furthermore, East Kutai Province is also included in the government's Gernas Kakao program (a movement to increase the national production and quality of cacaos).

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: The cacao plantations in the Kutai Ecosystem are one of the mainstay of farming in Kutai Province. The distinguished characteristic of its chocolate that does not easily melt, makes cacao one of main cultivated commodities in this ecosystem other than rubber, and palm oil.

Plantation commodities in Kutai Ecosystem

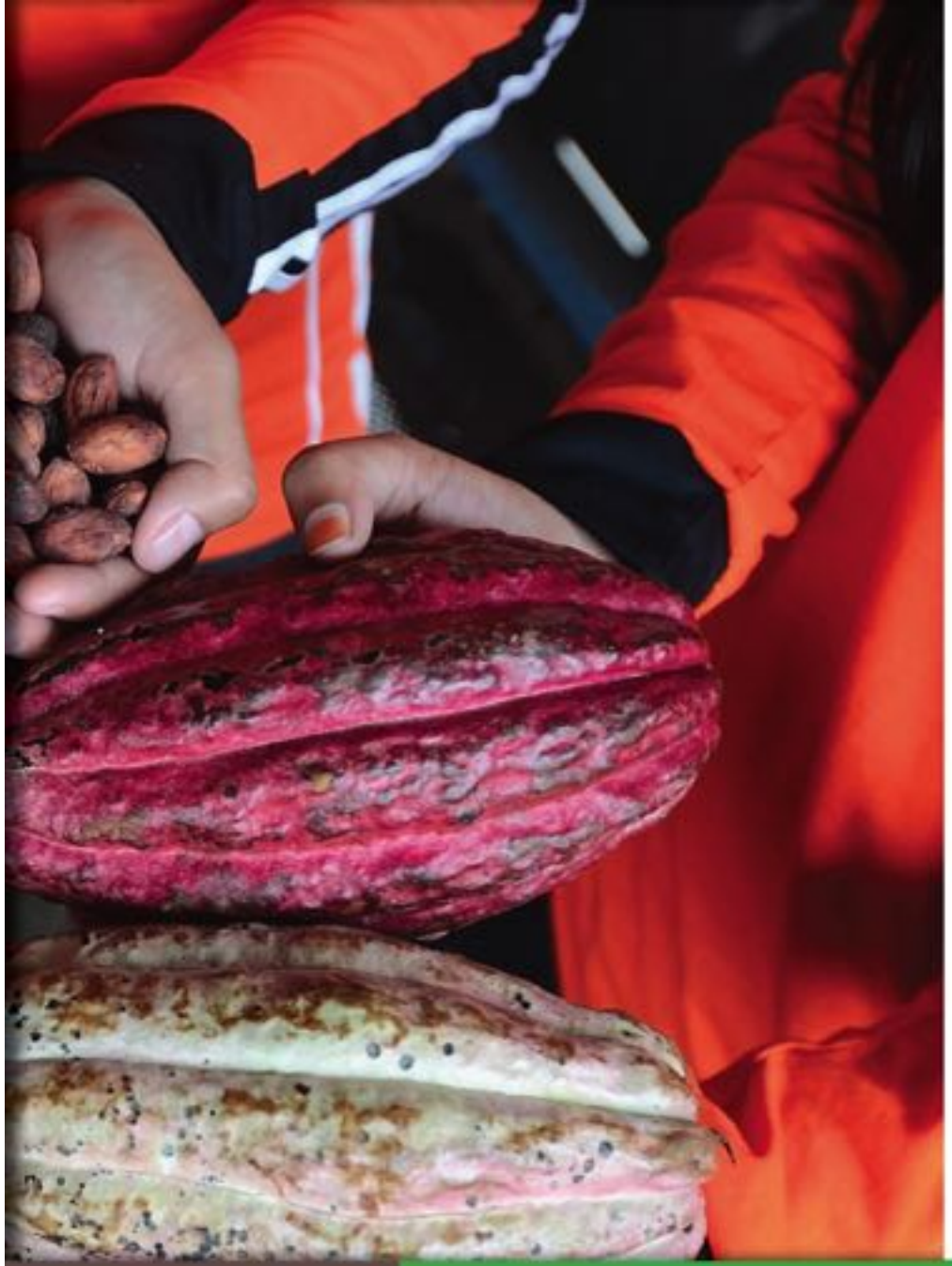
Regencies/cities	Plantation areas and type of crops managed/cultivated by smallholders									
	Sugar Palm	Clove	Cacao	Rubber	Palm Oil	Coconut	Candlenut	Coffee	Pepper	Others
Kutai Kartanegara	42	28	1,000	26,167	18,849	2,884	48	172	1,423	6
East Kutai	34	27	2,746	10,472	17,111	1,031	259	172	303	5
Samarinda	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 CACAO 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. Support program for agricultural and downstream cacao processing machines US $ 11,270 per site (small industries/cooperatives).
5. Management program, US $ 1,700 per month.
6. Cacao replanting program, US $ 8,386 per hectare (1100 seeds).



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