



YAYASAN
Belantara



COFFEE CATALOGUE

ABOUT



YAYASAN
Belantara

Yayasan Bersama Lestarian 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.





COFFEE

HISTORY & FACTS



Coffee has a long history and development in Indonesia. The existence of coffee in Indonesia began in 1696, when the Dutch Governor of Malabar, India, sent Yemeni/Arabica coffee seedlings to be planted in the island of Java. At first, the seedlings were planted in Kadawung, Batavia (now Pondok Kopi, Jakarta), but unfortunately failed due to flooding. Three years later the Dutch brought back new coffee seedlings from Malabar, and this time coffee successfully grew on plantations in Java Island. Now, coffee grows well in the plantations in Java Island and has surpassed its place of origin, Yemen (Cecep, 2017).

Presently, coffee in Indonesia has developed exponentially with many varieties and clones and can be planted specifically on any soil conditions and topography in Indonesia. The government has been putting lots of efforts into making coffee as one of the primary plantation commodity. To a large extent, the spread of coffee crops in Indonesia averages on smallholder plantations, in which the ownership itself varies, with the average area of land ownership of 2 ha from transmigration programs and 0.5 ha from native land ownership in Java Island. Up to 2015, the area of coffee plantations in Indonesia has reached 1.18 million hectares, in which 2,509 ha are state coffee plantations, and 25,447 ha are private coffee plantations, with exports reaching 502,021 tons, valued at US \$ 1.197,735 billion (Ministry of Agriculture, 2016).

One of the Indonesian government's commitments, which is supported by several development institutions, donors and companies is the encouragement of SCOPI (Sustainable Coffee Platform of Indonesia), a non-profit association with objectives to improve the management of coffee commodities, maintain production quality, obtain better prices and access to global markets. An industry study for a sustainable coffee program conducted by Techno Serve concludes that Indonesia is the world's second largest exporter of Robusta coffee. The study also states that 7% of Indonesia's coffee export volume has been certified or verified as sustainable. Although the domestic consumption of coffee is increasing, the production, in general, is not; one of the reasons is low productivity, especially in traditional coffee plantations.

However, the problems are not only land ownership, cultivation techniques and the selection of coffee varieties or clones -a serious concern to the coffee plantations belonging to smallholders, the additional problems are the coffee crops that the smallholders grow on average follow their peer farmer, as well as information/instructions from collectors and middlemen who provide loans or buy agricultural commodities from them. This is evident by the amount of yields the smallholder coffee plantation only produce, an average of 0.5 tons/ha compared to 0.88 tons/ha of state plantation, and 0.71 tons/ha of private plantations.

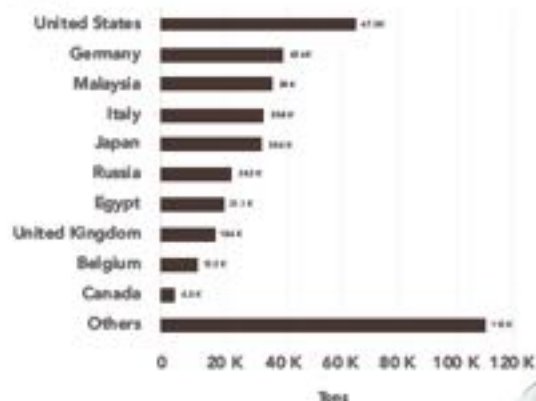
THE ECONOMICS OF INDONESIAN COFFEE PRODUCTION

According to an industry study for a sustainable coffee program released in March 2014, Indonesia's coffee production is supplied by 1.5 million smallholder groups with an average land holding of less than 1 ha per smallholder. Even so, it is estimated that only half a million of these coffee smallholders actively work on their plantations for commercial purposes. More than 60% of robusta coffee produced in Indonesia is based in South Sumatra Province.

Indonesia's coffee market is very free; local and international exporters can compete. Most coffee smallholders are not organized, and the role of the cooperatives is very weak, and is exploited by middlemen and collectors who sell green coffee beans to exporters. Exporters control the added value of processing and export standards preparation.

The low productivity of coffee-producing land per ha in Indonesia is an important issue for future improvement. Vietnam, with an area of 1 ha per farmer/household, is able to produce 3 times more than active coffee farmers in Indonesia and has successfully increased their coffee production significantly over the past 30 years, while Indonesia's coffee production has been experiencing a stagnating trend. A trend that is influenced by the aging coffee plants and the lack of smallholders who adopt Good Agricultural Practices (GAP) such as pruning and integrated pest control.

Indonesia is one of the largest coffee producers in the world with production reaching 639 thousand tons in 2016. Famous Indonesian coffees that are well known are Toraja coffee, Lampung coffee, Mandailing coffee, Aceh coffee, and especially Luwak coffee, with its delicious taste that demands a premium price to be served for the coffee connoisseur (Katadata, 2016).



COFFEE

CLIMATE AND TYPES

1. COFFEA ARABICA

Climate: Arabica coffee (*Coffea arabica*) is ideally grown with the altitude between 1000-2000 m asl and a required rainfall of 1250-2000 mm per year. Arabica coffee was the first coffee brought by the Dutch to Indonesia and planted on the island of Java. Arabica coffee was once a major coffee export commodity to the European countries.

Physical characteristics:



Arabica coffees can be physically identified from the form of its plants and its small-sized fruit. Arabica coffees are low in caffeine, and poses a fragrant aroma compared to the other two types of coffee. The leaves are smooth, and the wave and bone of the leaves are not clearly visible. Arabica coffees are mostly located on plateaus. Famous Arabica coffee producers in Indonesia are Aceh Province, Pagar Alam (in South Sumatra Province), throughout Java Island (Pangalengan Sub-district, Bogor Regency, Wonosobo Regency, through East Java Province).

Benefits: Arabica properties can stimulate the brain to prevent Alzheimer's, and Parkinson's, relieve stress due to work stress, increase the metabolic processes by stimulating the brain to stay active and increase arousal and mood.

2. COFFEA LIBERICA

Climate: The Liberica coffee (*Coffea liberica*) was planted in Indonesia after the attack of *Hemileia vastatrix* disease that destroyed the arabica coffee plantations in Java Island. Libericas can be grown in the lowlands between 10 - 900 m asl, especially on acidic-textured peatlands.

Physical Characteristics:



Liberica coffees can be identified by its large fruits and small seeds. The plant's physiology is almost similar to the jackfruit tree; therefore in some areas, they are also called as the jackfruit coffee.

Benefits: Liberica coffee is known to increase vitality, and prevent degenerative diseases.

2. COFFEA ROBUSTA

Climate: Robusta coffee (*Coffea canephora*) is the most type of coffee sold in the local market. It is the mainstay for the small cafes to serve affordable coffee to the masses. Robusta has many types of clones and varieties and grows well at an altitude between 100-800 m asl. Robustas requires 1-3 months of dry season or < 60 mm rainfall intensity to stimulate flowering and ensure the flowers do not fall out from the branches before becoming a proper and healthy coffee.

Physical Characteristics:



Robusta coffee can be identified by its flexible stem that extends downwards, large wavy leaves, leaf veins/bone that are clearly visible. Robustas have several variants of clones that are resistant to PBKo and nematodes (Choke Stalk Chocolate). Even so, some do not possess the same resistance to PBKo and nematodes. Robusta coffee are used as a substitute for arabica coffee in the lowlands due to its more resistance to *Hemileia vastatrix* disease or rust leaf.

Benefits: Robusta coffee is known to be able to neutralize poison of the bongkrek tempeh (a variety of tempeh from Central Jawa) and revive and increase stamina and concentration.

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

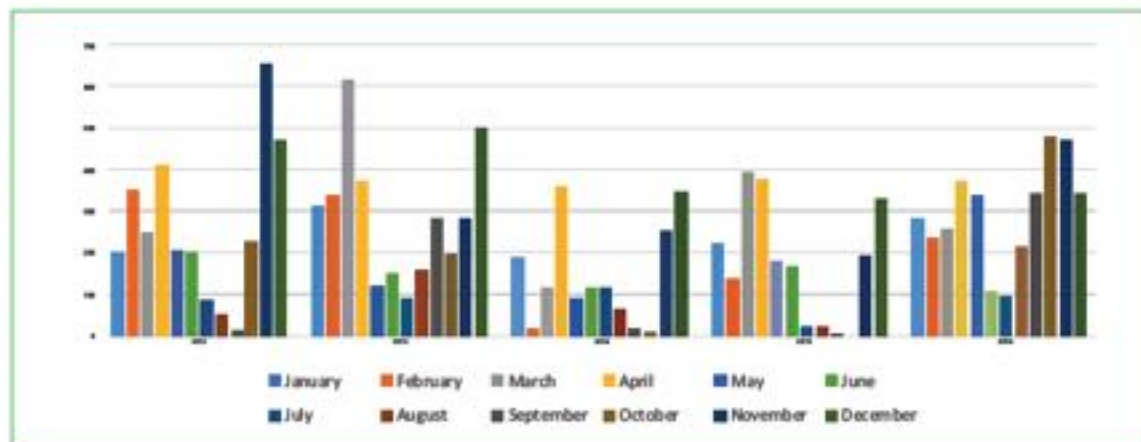
South Sumatra consists of eleven types of soils, namely:

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

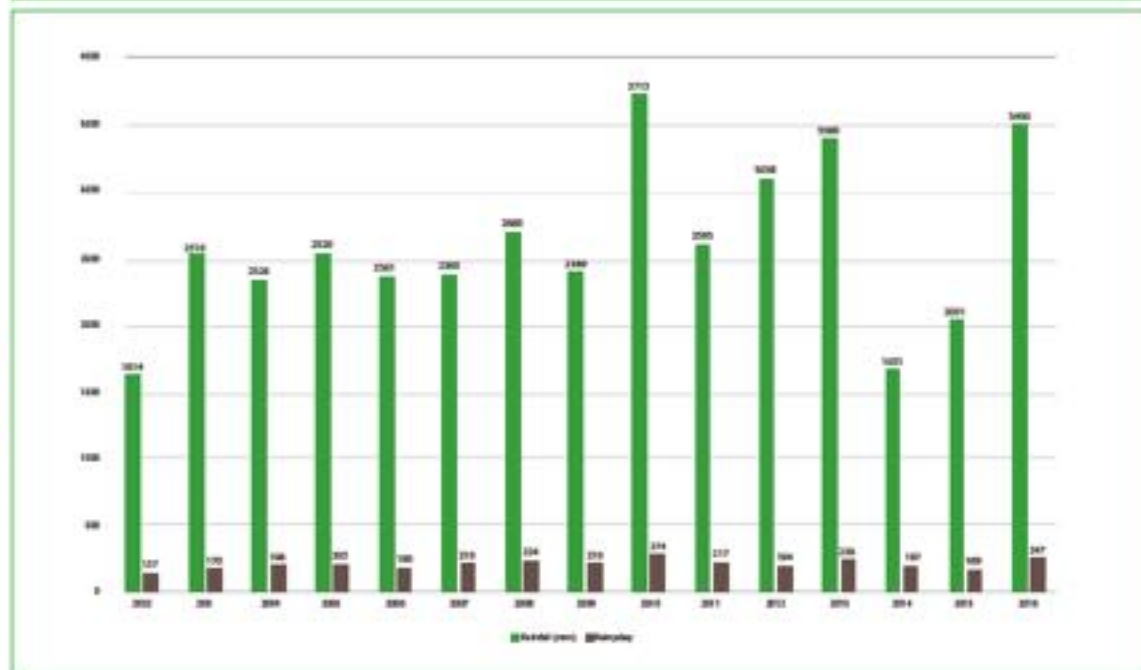
The annual rainfall graph of the last 5 years

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)

There 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.

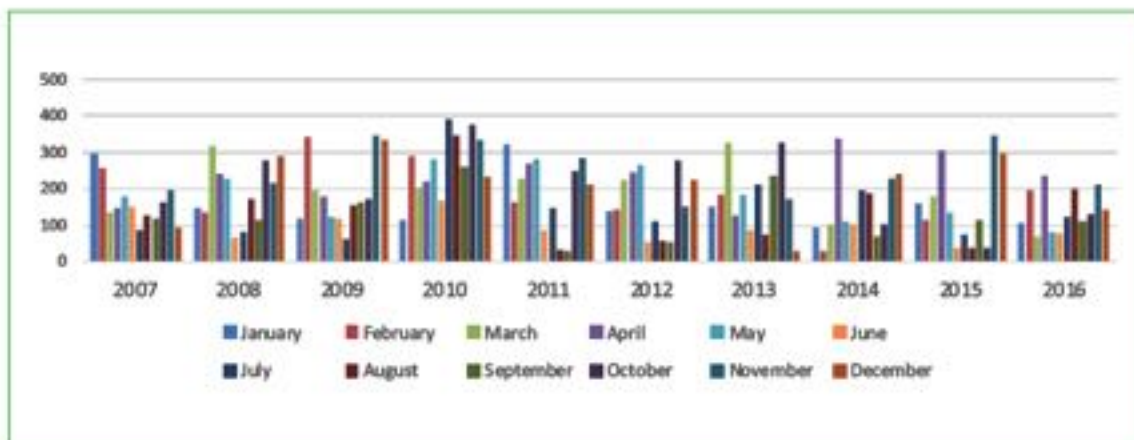
a. 1. The Types of Soil and it's Percentage

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 Hydromorphic	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

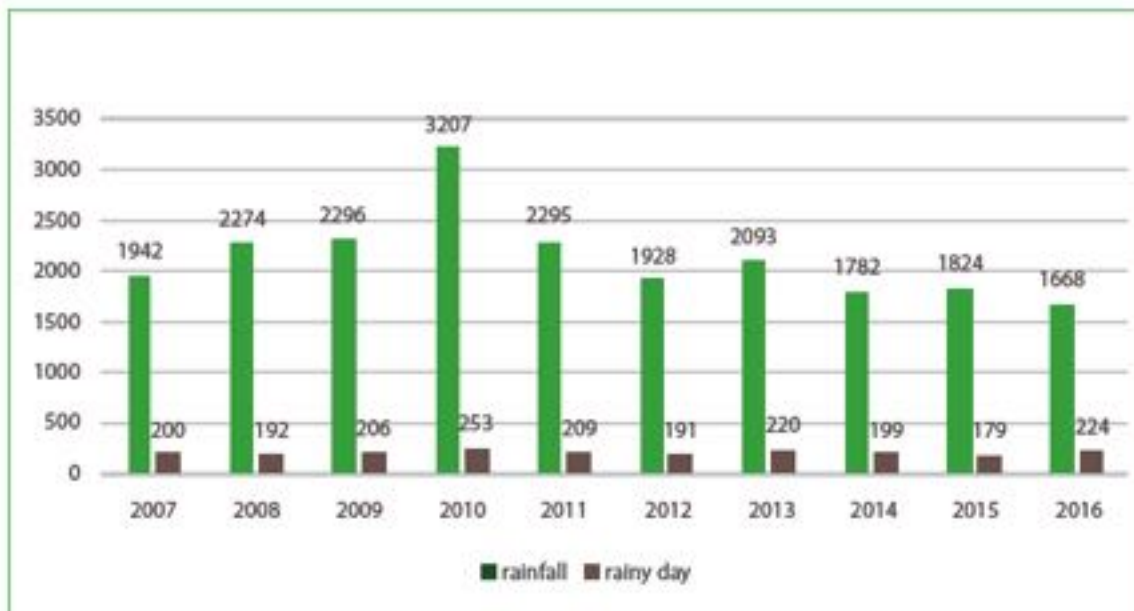


B. Climate



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

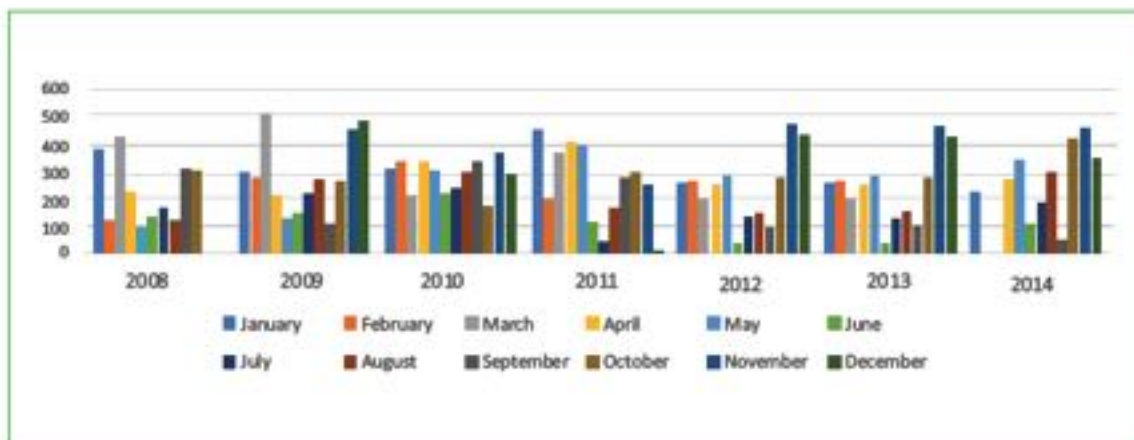
No.	Soil Type	Area	Rock Form	Physiography
1	Podzol	209,600	Sedimentary rock	Flatland
2	Red-Yellow Podzolic	-	Sedimentary Rocks dan Igneous Rocks	Foldland
3	Red-Yellow Podzolic (Complex)	218,200	Igneous Rocks	Intrusion
4	Red-Yellow Podzolic Latosol and Litosol	94,800	Igneous Sedimentary Rocks and Metamorphic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





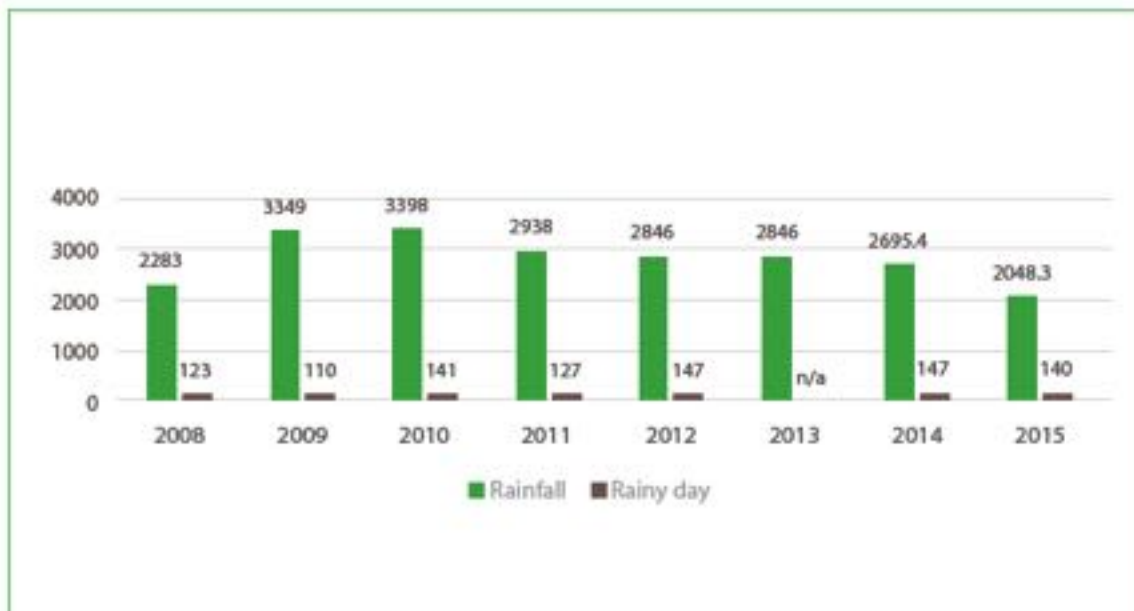
Photo Credit: © Choi Sir Mariani

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	Letosol
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



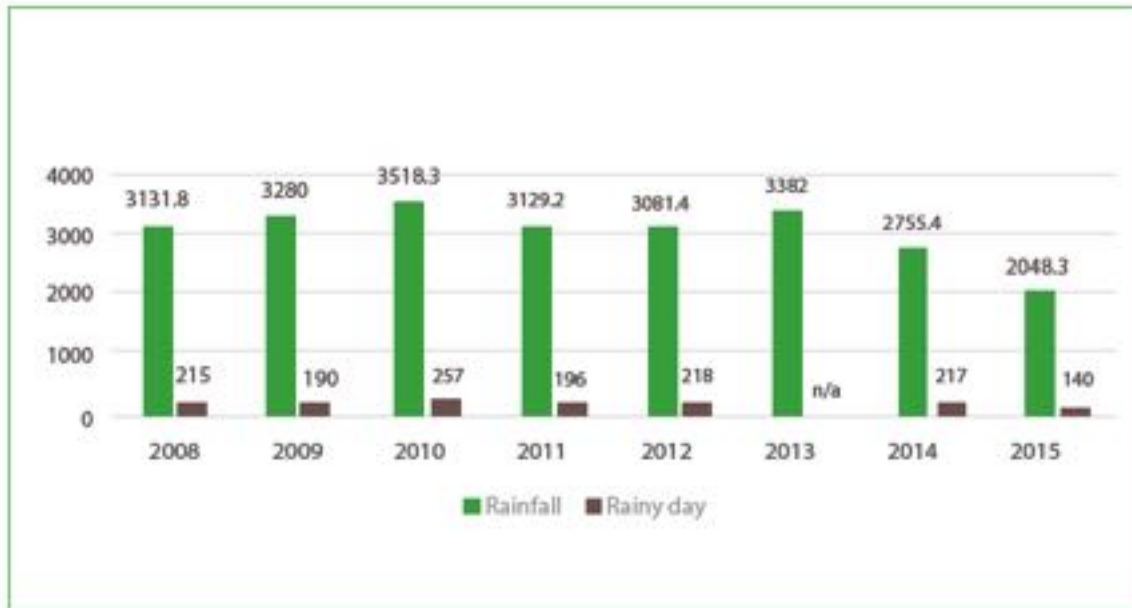


b. Climate



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

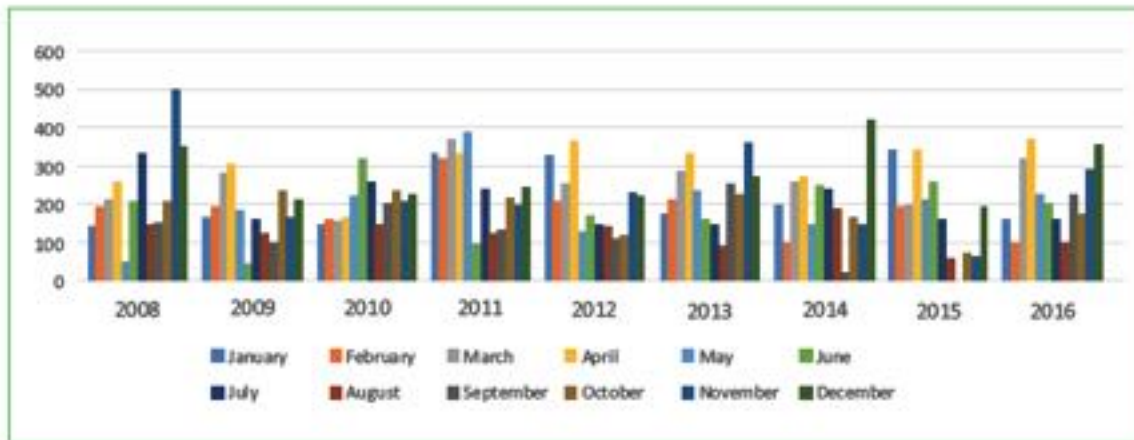
a. Soil State

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 podzolic with low fertility.



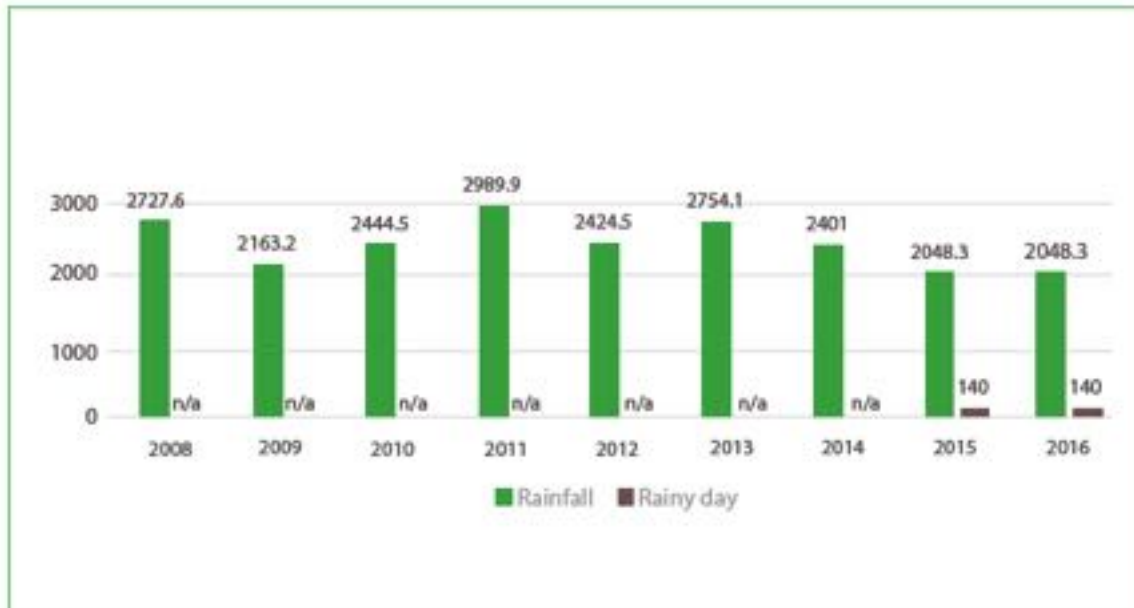


b. Climate



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



Liberica

Robusta

Arabica

ECOSYSTEMS

THE INDICATIVE MAP OF COFFEE

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



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

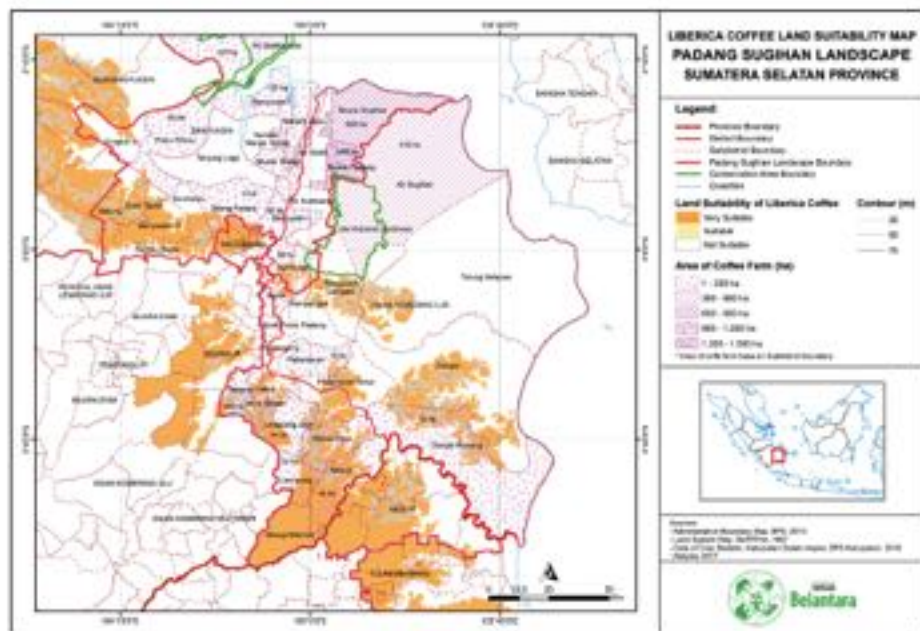


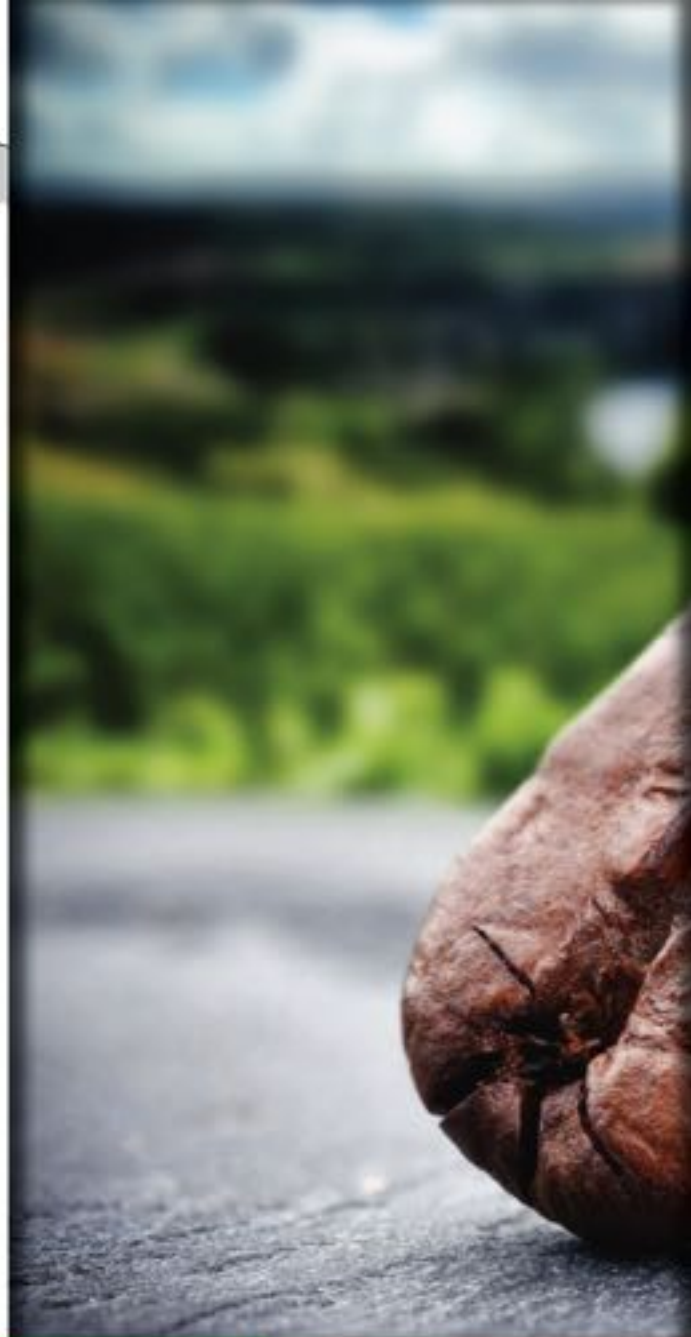
Figure 1. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Padang Sugihan Ecosystem

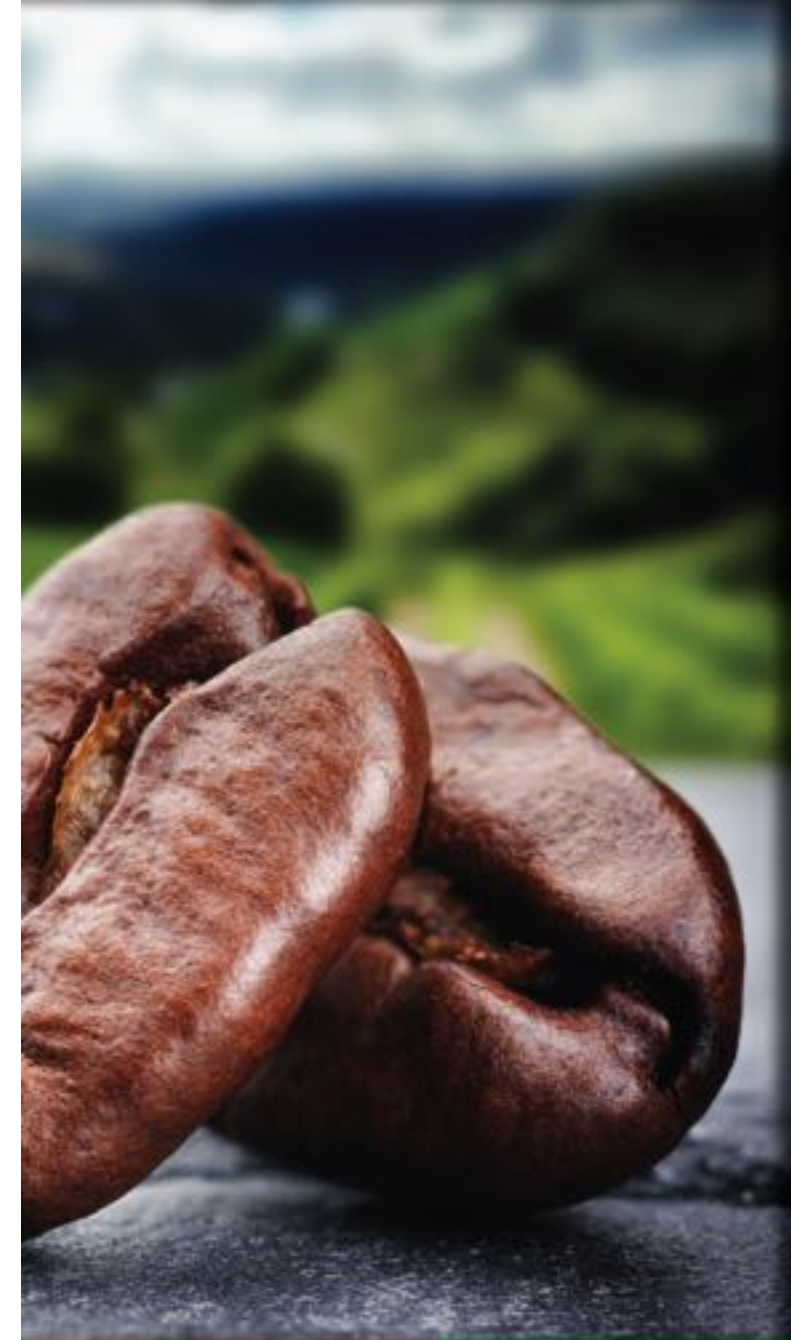
Map Analysis: Refer to Figure 1. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Padang Sugihan Ecosystem.

Based on the land conditions of the Padang Sugihan Ecosystem, the areas outside of the wildlife reserves in this ecosystem are suitable for Robusta coffee plantations, such as the three sub-districts of Ogan Komering Ilir Regency: Cengal Sub-district, Padamaran Timur Sub-district, and Lampam Sub-district. Additionally, Air Sugihan Sub-district in Ogan Komering Ilir Regency and Muara Padang Sub-district in Banyuasin (outside of the Padang Sugihan Ecosystem) are suitable for Liberica coffee plantations.

Besides rubber and palm oil, coffee plants grown by the rural communities have become one of their primary source of income. Even so, there are improvements needed for the coffee farmers in Air Sugihan Sub-district and Muara Padang Sub-district in GAP (Good Agricultural Practices) and GMP (Good Manufacturing Practices).

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 ecosystem of Padang Sugihan is potential for cultivating Liberica and Robusta coffees. Even so, besides GAP (Good Agricultural Practices) improvement, finding a captive market and a lean supply chain to be connected to the farmers is needed to increase their interest in planting coffee as their primary commodity.

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, Ogan Komering Ilir Regency's, and Banyuasin Regency's Central Bureau of Statistics)

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

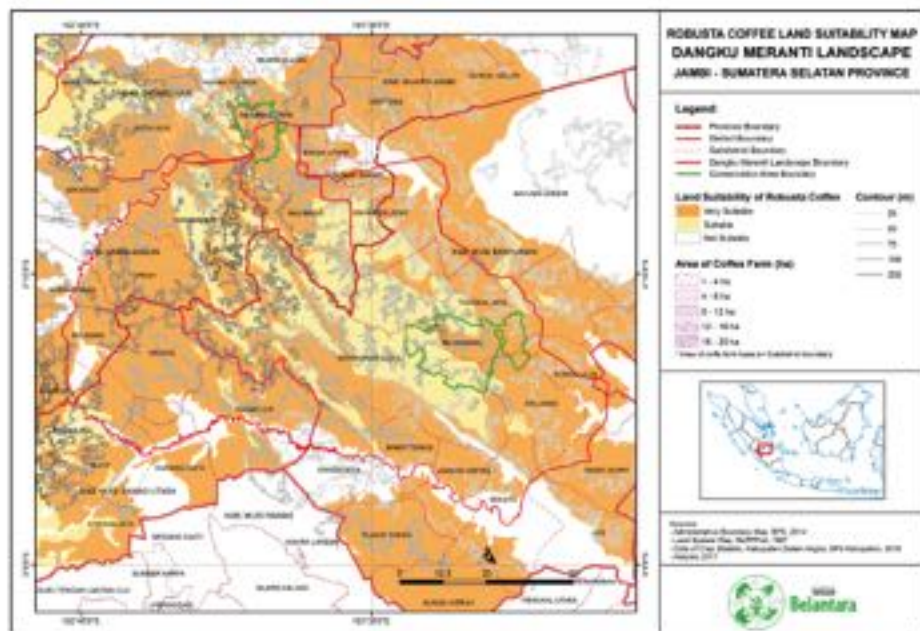


Figure 2. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Dangku Meranti Ecosystem

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

The Dangku Meranti Ecosystem is very suitable for coffee cultivation, both within and outside of the protected areas. However, almost all the farmers in this ecosystem plant rubber, palm oils, or coconut (for copras). This is due to the growth of supporting industries, such as rubber and palm oil mills near the ecosystem of Dangku Meranti.

In this Ecosystem, besides traditional farming, many rubber and palm oil plantations in this area are built by plasma factories. The existence of intermediaries around this region also contributes to the growth of the rubber commodity supply chain.

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: Although the land conditions of the Dangku Meranti Ecosystem is very suitable for planting coffee, it is not the primary crop grown. The average smallholder in this ecosystem grows rubber crops. Consequently, the Dangku Meranti Ecosystem is the largest rubber commodity supplier in South Sumatra Province.

The plantation commodities 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 – (Not Suitable for a Coffee Plantations)

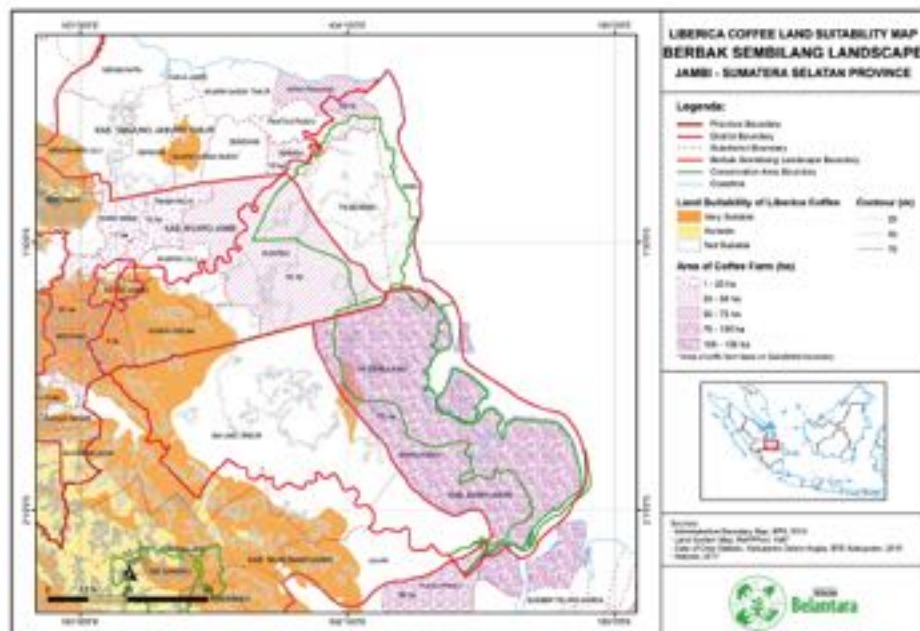


Figure 3. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Berbak Sembilang Ecosystem

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

Coffee is not the primary commodity grown in the ecosystem of Berbak Sembilang, but is planted as a companion crop or a seasonal crop. The location of the plantations in this ecosystem is in the peat areas, which is directly affected by sea water. The population in this ecosystem tend to rely on coastal and sea-based products, such as shrimp paste, shrimp, and shrimp crackers.

The Berbak Ecosystem is surrounded by HTI (Industrial Forest Plantation) concessions, therefore obtaining land for coffee plantations, either for planting coffee from the initial stage as well as seeking farmers who focus on coffee as their primary crop is quite difficult.

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 Berbak 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: Coffee in the Berbak Sembilang Ecosystem is only suited to be planted in the peatlands. However, with coastal residents who depend their lives on the coastal and sea, HTIs surrounding the ecosystem, as well as the geographics of the Berbak Sembilang Ecosystem, coffee is not planted widely in this ecosystem and would require considerable effort, and would be less profitable to cultivate.

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 Statistics).

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

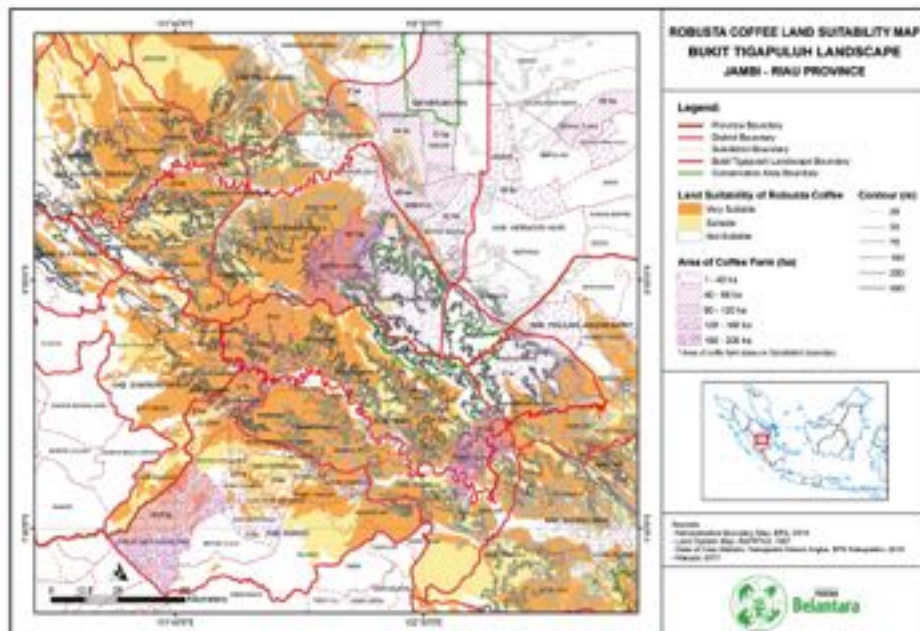


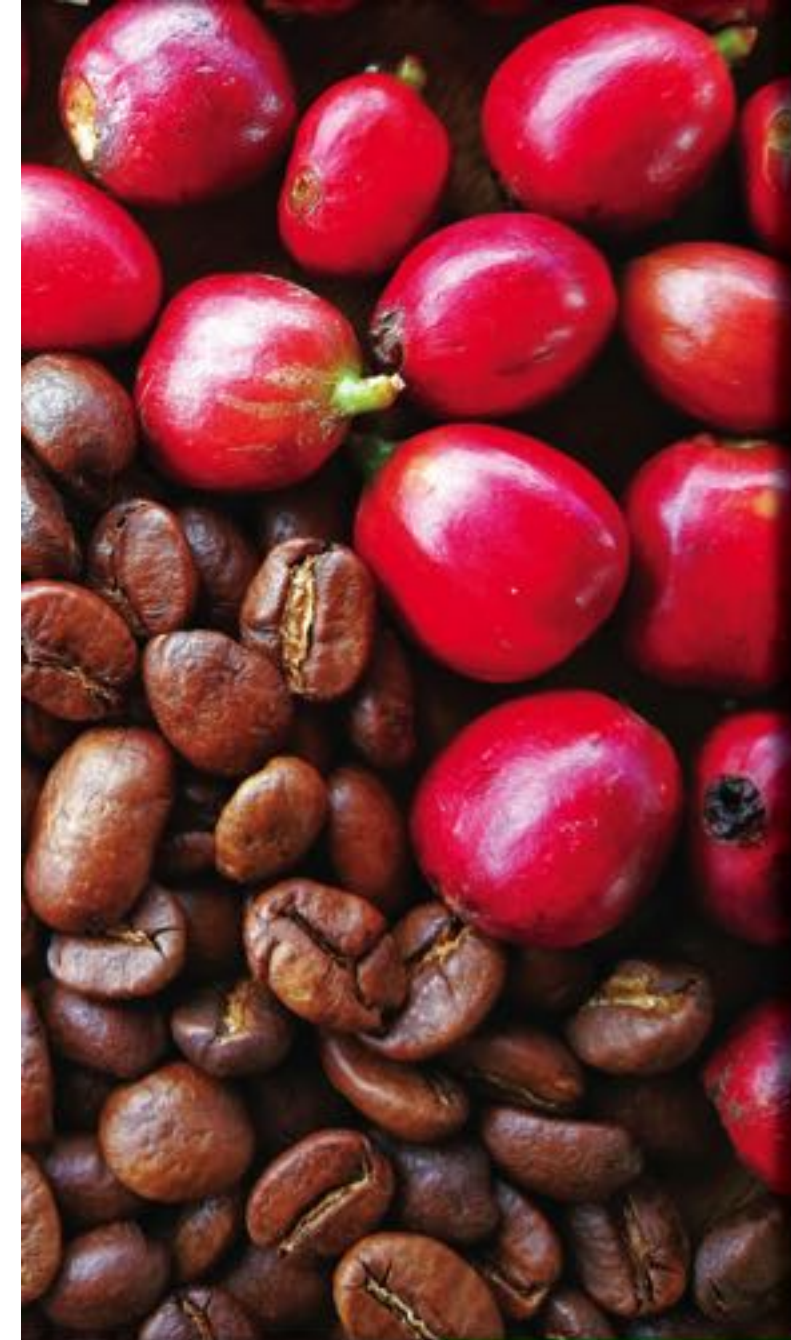
Figure 4. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Bukit Tigapuluh Ecosystem

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

Rubber, palm oil, and coconut plantations dominate the Bukit Tiga Puluh Ecosystem and are the primary source of income for the farmers in this ecosystem. Besides the primary commodities of rubber, palm oil and coconut, farmers also grow companion crops, such as coffee, cacao, areca nuts, and various types of companion crops. Even so, Tabung Jabung Regency has its own uniqueness, the farmers in this area have arranged a geographically based farmer group that produces a unique blend of coffee, which is called the Kuala Tangkal Liberica Coffee or the Kuala Tangkal Peat Coffee. The coffee farmers in this ecosystem also plant companion trees as shades for the coffee plants and areca palms.

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: The Bukit Tiga Puluh Ecosystem has an excellent liberica coffee product from Tanjung Jabung Regency. However, since most coffee farmers in this ecosystem intercrop coffee and areca nuts together, assistance in GAP (Good Agricultural Practices) is needed. Additionally, assistance for GMP (Good Manufacturing Practices) to ensure that the farmer's product can compete in the downstream industry is highly recommended.

Plantation Commodities in the Bukit Tigapuluh Ecosystem

Regency/City	Plantation Areas (hectares)									
	Clove	Cacao	Rubber	Palm Oil	Coconut	Coffee	Pepper	Areca nut	Sago	Others
Buntan Singingi	7.06	149.26	47,923.23	36,469.54	288	10.13	0.05	8.62	0.13	0
Indragiri Hulu	0.38	593.94	46,810.77	79,434.38	262.05	14.94	0.01	282.94	0	0.5
Indragiri Hilir	3.3	89.1	3,939.32	61,578.64	230,307.10	469.78	0.17	10,073.81	1,109.09	13.89
Tanjung Jabung Barat	0	77.23	9,734.04	34,711.30	83,587.47	3,792.77	3.18	18,712.97	0	0
Tebis	0.77	317.32	109,203.3	28,019.47	189.31	27.17	0.16	7.16	0	0
Bungo	6.27	214.89	76,759.80	34,653.78	134.2	489.83	0	10.49	0	0
Total areas (ha)	19.61	1,325.74	296,309.90	294,468.91	246,769.14	4,803.25	3.57	26,977.69	1,109.19	14.39

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

5. Kerumutan Ecosystem – (Suitable for Liberica Coffee Plantations)

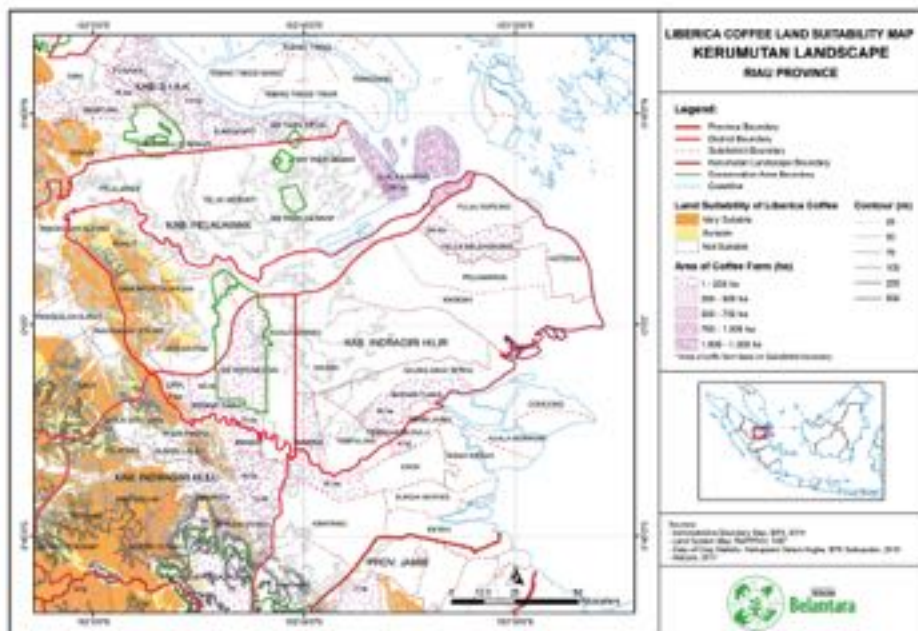


Figure 5. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Kerumutan Ecosystem

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

Palm oil and coconut plantations encompass the ecosystem of Kerumutan. Riau Province is one of the major palm oil (CPO) and packaged coconut milk producing provinces, with Indragiri Hilir Sub-district being the center of Indonesia's coconut commodity that is supported by the local government to make coconuts a primary focus for the downstream processing industry. Besides the prolific palm oil and coconut plantations, the coffee commodity in this ecosystem is also quite developed as there are many liberica coffee plantations near Kuala Kampar Sub-district.

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 its 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: Coffee crops in the Kerumutan Ecosystem is mostly cultivated around Rangsang Island Sub-district, Meranti Island Regency. However, the the liberica coffee in this ecosystem experiences fluctuating production capacity and needs GAP (Good Agricultural Practices) inputs and modifications. Also, there need to be improvements in supply chain and marketing.

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 Coffee Plantations)

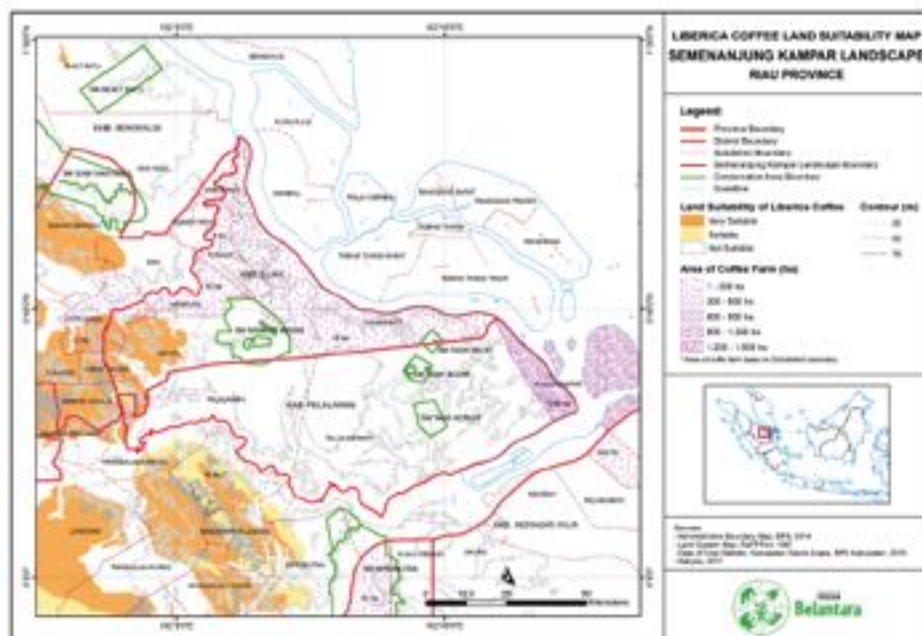


Figure 6. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Kampar Peninsula Ecosystem

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

A look at the Land Suitability Map for Coffee in the Kampar Peninsula Ecosystem it is seen that it is mostly white and only a few hotspots for coffee exist. It is because the land is unsuitable for planting coffee. Palm oil and rubber plantations dominate this area as most of the inhabitants depend on palm oil plantations, either by becoming plasma farmers, plantation workers, freelancers, factory workers, or transporters of palm oil yields.

The residents of the Kampar Peninsula Ecosystem receives GAP (Good Agricultural Practices) knowledge from training initiated factories through its CSR (Corporate Social Responsibility) and core programs. Similar to the coffee in Kerumutan's Ecosystem, the coffee grown in this ecosystem are liberica coffees and are grown around Sungai Apit Sub-district and areas near Kala Kampar Sub-district and Rangsang Sub-district, outside of the ecosystem's boundaries. The Rangsang Sub-district has had an influence on the distribution of liberica coffee to its surrounding areas.

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: Coffee is not the primary crop cultivated in the ecosystem of Kampar Peninsula. This ecosystem is enduring a lot of pressure on its protected area and can be a potential for conflict to incur. There are only a few Coffee farmers in this ecosystem, some are farmers from Rangsang Sub-district, an area outside of the Kampar Peninsula Ecosystem boundary. The farmers from Rangsang Sub-district were influential in making liberica coffee as the main coffee variety grown in this ecosystem.

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 Coffee Plantations)

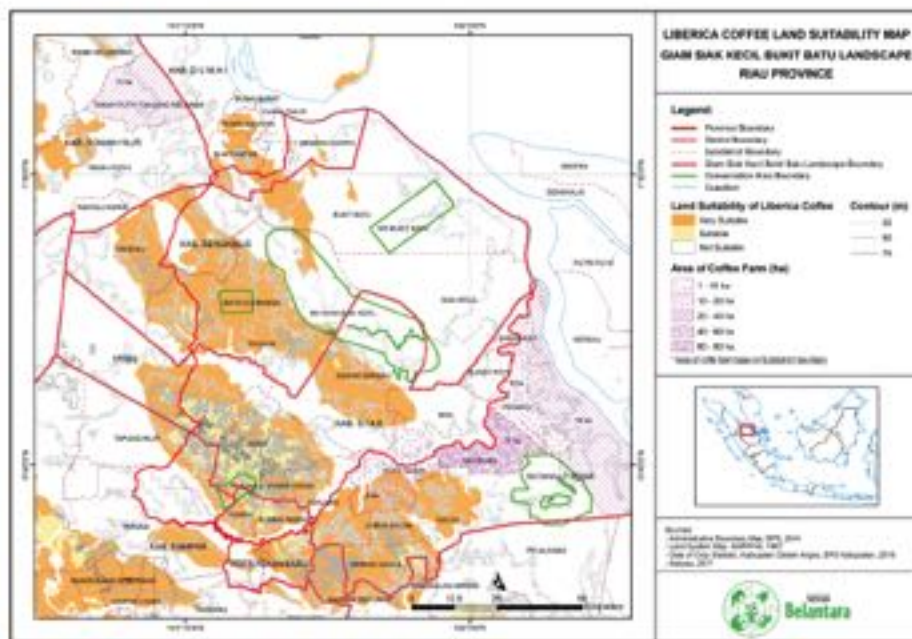


Figure 7. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Giam Siak Kecil Bukit Batu Ecosystem

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

The Giam Siak Kecil Bukit Batu (GSKBB) Ecosystem is encompassed by rubber, palm oil, and coconut plantations. Although suitable for coffee, palm oil plantations have been dominating this ecosystem and even tend to monoculture (planted with a single type of plant).

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: Coffee is not the primary commodity grown in the ecosystem of GSKBB. Communities that grow coffee plants are likely to be migrant/transmigrant communities and are planted to only meet their own needs or as a side commodity that can be sold to collectors or sell in the traditional markets. The commodity development programs in this area should prioritize in the development of the primary commodities to increase its quality and selling value.

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)



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

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

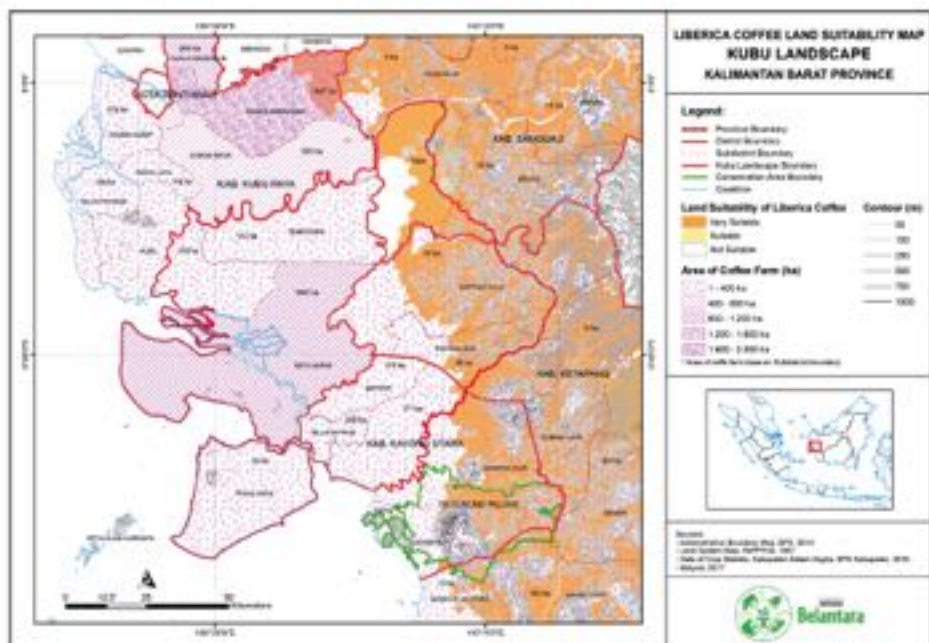


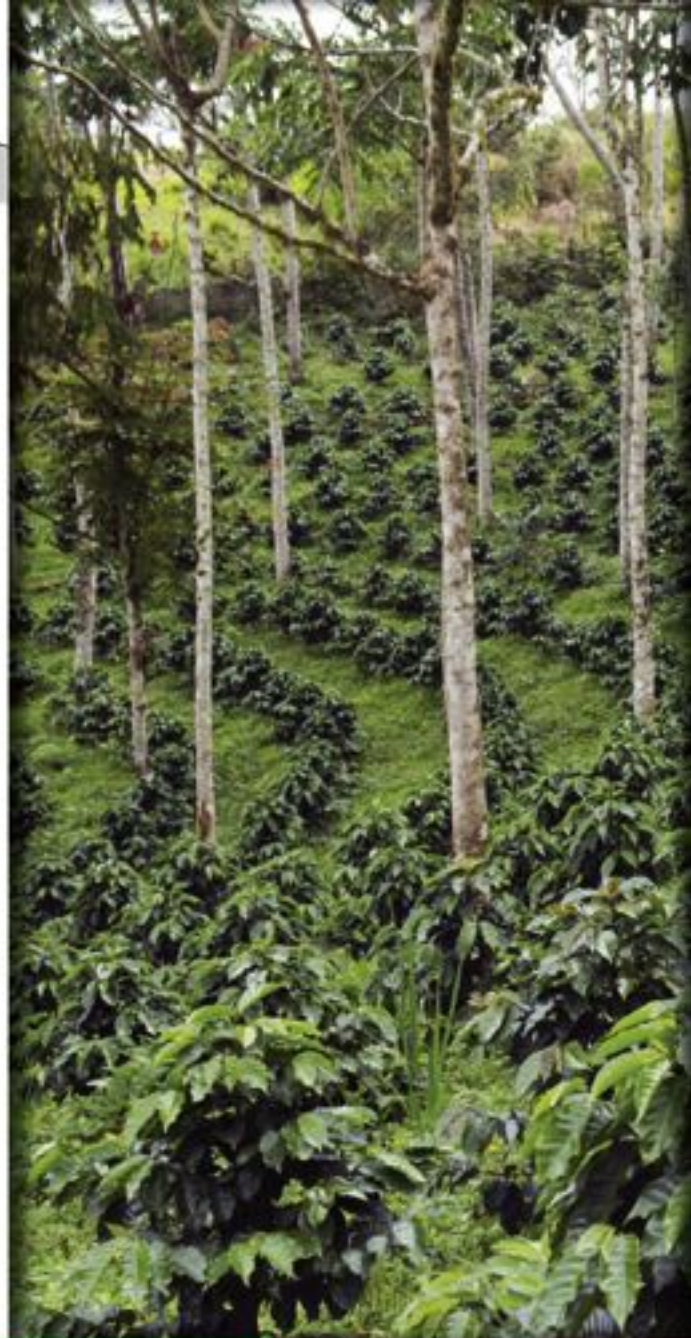
Figure 9. The Map of Land Suitability for Coffee and Areas of Coffee Farms in Kubu Raya Ecosystem

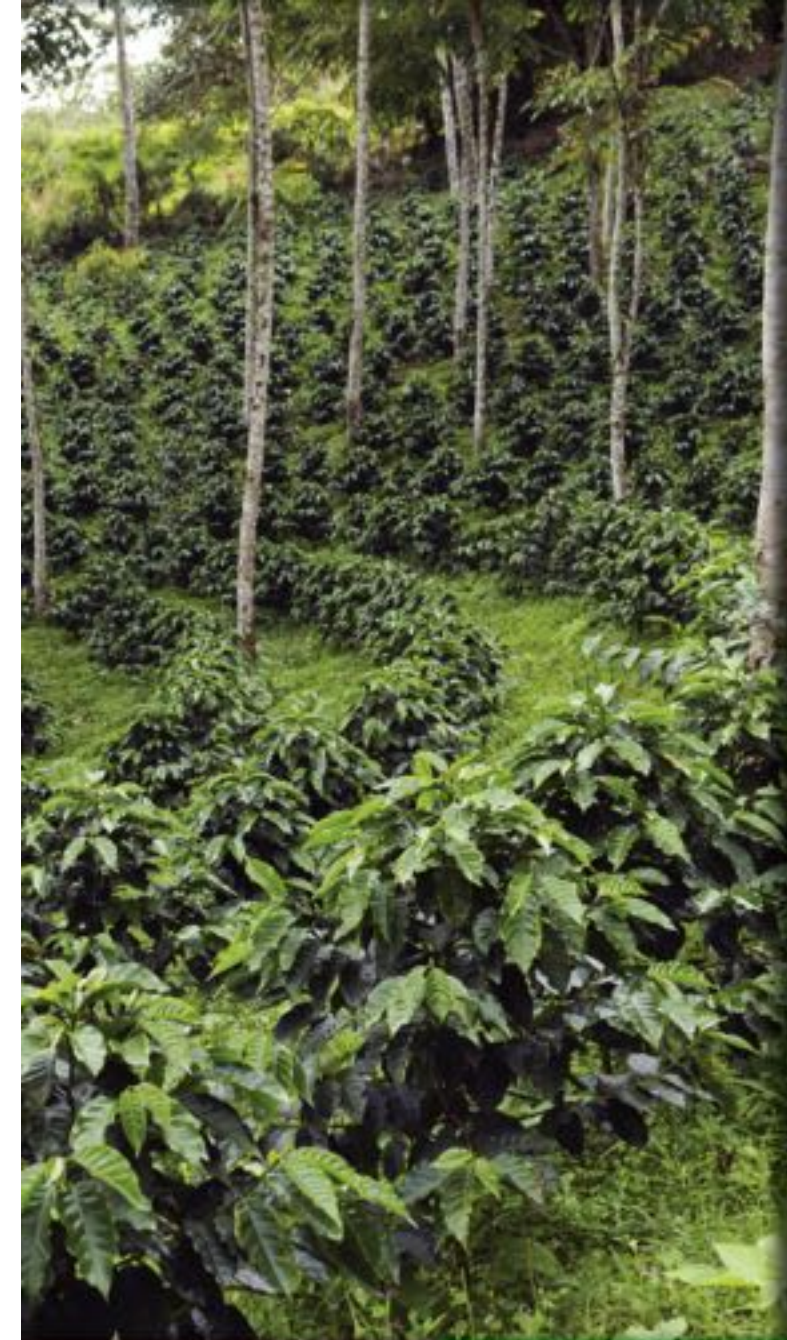
Map Analysis: Refer to Figure 9. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Kubu Raya Ecosystem.

The Kubu Raya Ecosystem has a fairly old history of coffee plantations and is seen by the existence of the early arabica coffee plantings by the Dutch. The communities in the Kubu Raya Ecosystem have made coffee their daily needs, and the many small coffee warungs (traditional stall) that exist in this ecosystem reflects it.

The people in this ecosystem tends to grow coffee as intercroops among their primary crops, which are rubber and palm oil. While in Sanggau Regency coconut is the primary commodity since there is a coconut processing industry in this regency. The quality of coffee produced by smallholders in the ecosystem of Kubu Raya tends to be low, which is caused by the inadequate post-harvesting process. The coffee that they grow on their land is a combination of robustas, libericas, and some arabica derivatives that have potentially mixed with robustas or libericas.

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 inhabitants of the Kubu Raya Ecosystem have made coffee their daily needs, they are the consumers of coffee products and drive the coffee supply chain demand to run continuously. The community of this ecosystem also tends to grow coffee and other companion crops on their land as intercrops to make up for the fluctuating price of a commodity when it is low.

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 Coffee Plantations)

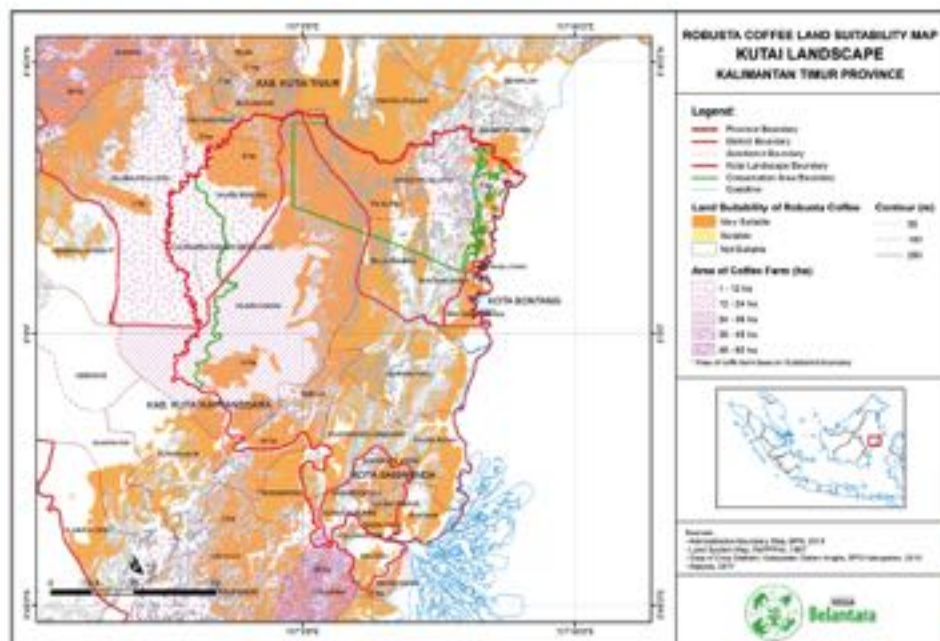


Figure 10. The Map of Land Suitability for Coffee and Areas of Coffee Farms in Kutai Ecosystem

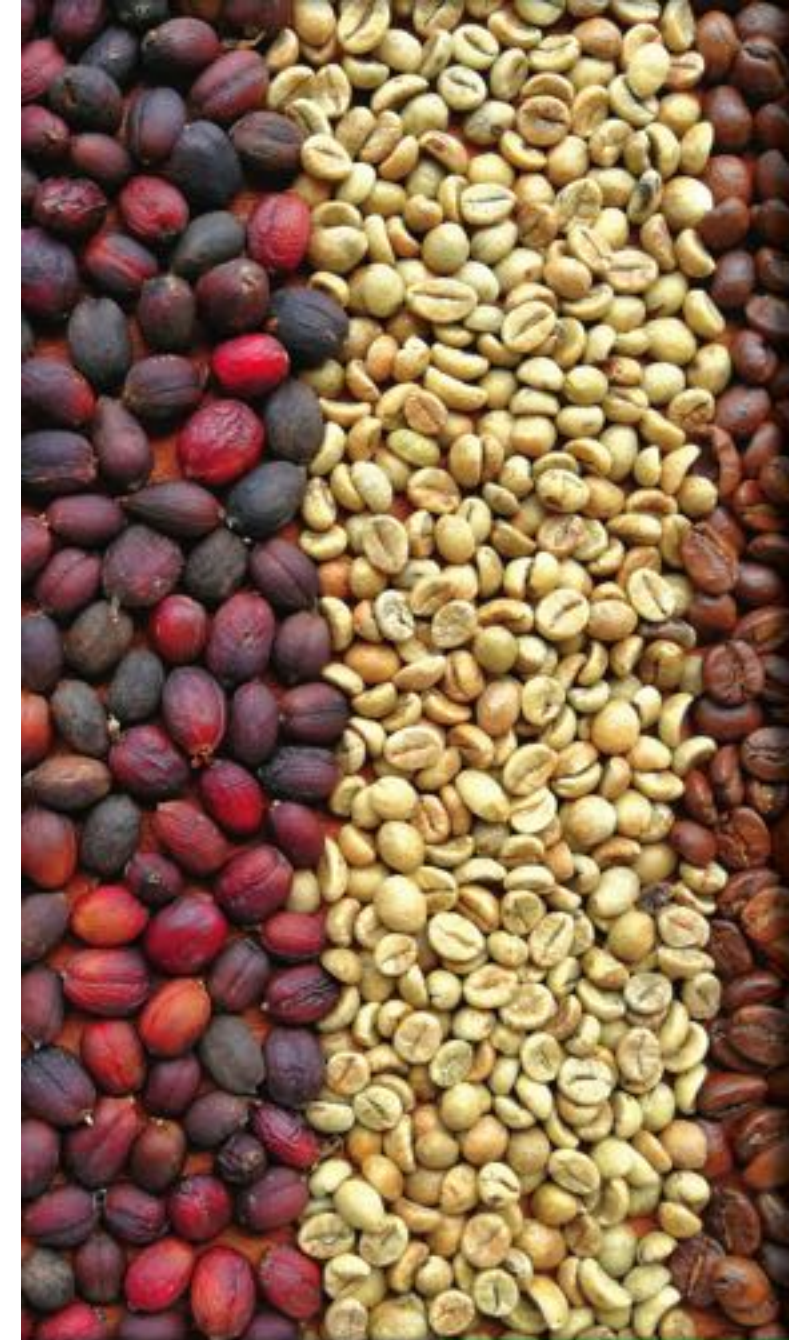
Map Analysis: Refer to Figure 10. The Map of Land Suitability for Coffee and Areas of Coffee Farms in the Kutai Ecosystem.

Unlike the Kubu Raya Ecosystem, coffee plants in the Kutai Ecosystem have no significant role in the daily life of its inhabitants. Besides of being profoundly impacted by palm oil plantations, coffee plantations in the Kutai Ecosystem, are also affected by horticulture plants and the mining sectors.

Horticulture plants have become the primary commodity in this ecosystem, especially the dragon fruit, which have become an icon on its own. The dragon fruits that are planted along with other crops, such as pepper plants along the main roads reflects this. Usually, the transmigrants are the ones cultivating coffee, as coffee plants need routine maintenance (pruning, fertilization, and harvesting) compared to the simple maintenance of dragon fruits is one of the reasons that coffee is not a primary commodity for the locals.

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: Although the Kutai ecosystem is suitable for coffee, currently horticultural crops, palm oil, and the mining sector are the main priorities for the locals. Moreover, the characteristics of coffee that need intensive maintenance compared to other horticultural crops have become one of the drawbacks of coffee growth in this ecosystem and one of the reasons that coffee is mainly considered as only a companion crop by the locals and are mostly just planted by transmigrants.

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: Agricultural Census of East Kalimantan Province 2013 (Statistic of East Kalimantan 2014)

COST FOR A COFFEE 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. Support program for agricultural and downstream coffee processing machines US \$ 7,300 per site (small industries/cooperatives).
6. Coffee replanting program, US \$ 9,157 per ha (1250 seedlings).





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
or contact us at **info@belantara.or.id**

 P: +62 21 391 5434
F: +62 21 391 5434

 Yayasan Belantara Boutique Office, 3rd Floor
Jl. Timor No. 6, Menteng
Jakarta 10350 Indonesia

 Belantara Foundation

 @Belantara

 Belantara_Found

Author

Aditya Kurniawan S.P.

(Belantara Stakeholders Engagement for Commodity)

Editor

Dr. Sri Mariati

(Executive Director of Belantara Foundation)