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Policy Analysis, Geospatial And Economic Value Of Plantation Areas In The Province Of East Kalimantan, Indonesia

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ABSTRACT

Policy analysis, geospatial plantation area and assessment (valuation) of the economic value of plantations in East Kalimantan require special attention for the purpose of providing certainty that the policy for establishing plantation areas in the Regional Spatial Plan has taken into account soil conservation. Based on the East Kalimantan Provincial Spatial Plan, it has been determined that the plantation area is around 3.2 million ha, however, the utilization of the provided land is not optimal, there are several plantation licenses that are not yet operational, this can affect the economic value of the plantation area. The economic value of these plantations will contribute to regional economic development. An indication that it is not optimal is that there is land that does not have the ability to be cultivated and or is not suitable for plantation business; therefore it is necessary to analyze the geospatial policy of the plantation area to determine the capability of the land that can be cultivated. In addition, it is necessary to analyze the economic value of the area to find out the contribution of the plantation sector to regional economic development. The results of the description analysis show that there are still about 23 percent of the plantation area that is not suitable for plantation crops because it has limiting factors for land use that cannot be improved. The results of the analysis of the potential economic value of plantation areas in East Kalimantan Province amounted to 235 trillion rupiah.

Keyword: Policy, Geospatial, Economic Value, And Plantation Area

INTRODUCTION

Production activities in land use in one area have an influence on ecosystem changes that have an impact on land degradation, however, production activities also provide opportunities for economic activities that occur in the area concerned. Land use in an area cannot be separated from spatial planning of an area that is integrated with existing potential and resources.

The development of plantation areas in the province of East Kalimantan is in line with local government programs that will make the center of agribusiness and agri-industry so that the acceleration of the area of this area continues to be accelerated. The local government does not only encourage regional development in the on-farm sector but also the development of upstream and downstream industries to support the area's activities.

The plantation area in East Kalimantan is dominated by oil palm with an area of 1.3 million ha out of a total area designation of 3.2 million ha, the development of this plantation area can be achieved due to the carrying capacity of both the local government and the community.

The presence of plantation area activities has a positive impact, especially in regional economic development and the environment, including encouraging the people's economy with activities dominated by large corporations so that there is an acceleration of economic development for

communities around plantations, but must maintain the ecosystem of the area. In addition, the growth of oil palm plantations in the East Kalimantan Province can support the need for new and renewable energy development, both from palm oil and palm oil mill effluent.

The development of plantation areas in the province of East Kalimantan is also inseparable from the problems faced by users and managers of plantation areas. The increase in the area of plantation permits and the added value of plantation derivative products have provided economic value that contributes to national development. However, this also raises several issues, such as environmental issues and land conflicts.

The development of the development of oil palm plantations which is provided for an area of 3.2 million hectares has not yet been fully operational, there are still location permits that have not carried out planting, so that there are abandoned lands that are burdened with permits but there are no activities.

Based on this, it is necessary to conduct a geospatial analysis of the suitability of the area that has been determined in the Regional Spatial Plan (RTRW) of East Kalimantan Province and take into account the Economic Value of the Region that can support regional economic growth.

LITERATURE REVIEW

Agricultural Areas in East Kalimantan Province are a combination of agricultural centers that meet the minimum limits of the economic scale of exploitation and the effectiveness of sustainable regional development management by taking into account soil and water conservation (Regional Regulation No. 1 concerning Regional Spatial Planning of East Kalimantan Province). Therefore, it becomes functionally related in terms of natural resource potential, socio-cultural conditions, production factors and the existence of infrastructure as supporting factors.

In the State of Indonesia, legal protection of agricultural land has been regulated in the Law of the Republic of Indonesia Number 41 of 2009 concerning the Protection of Sustainable Food Agricultural Land. This regulation emphasizes that sustainable food agricultural land must be protected and cannot be converted unless it is in the public interest. When the conversion of agricultural land is owned by a private person, the transfer of function cannot be carried out automatically but must go through a Land Use Change Permit (IPPT) which is applied for at the Land Office.

The plantation area which is mostly used for agricultural activities is an area that is determined based on the Agreement on Forest Use (TGHK) and the Provincial Spatial Plan (RTRWP). This plantation area is part of an area that has economic functions, ecological functions, socio-cultural functions that have the ability as a place for development. Activities in plantation areas are regulated by laws and regulations based on the principles of benefit, integration, togetherness, openness, justice and sustainability.

There are eight main objectives of plantation management, namely: (1) improving the welfare and prosperity of the people; (2) increase the country's foreign exchange sources; (3) provide employment and business opportunities; (4) increase production, productivity, quality, added value, competitiveness, and market share; (5) increase and meet the needs of domestic consumption and industrial raw materials; (6) provide protection to plantation business actors and the community; (7) manage and develop Plantation resources optimally, responsibly and sustainably; and (8) increasing the utilization of Plantation services. (Law of the Republic of Indonesia Number 39 of 2014 concerning Plantations). In the Act it is emphasized that Plantation is all activities of managing natural resources, human resources, production facilities, tools and machines, cultivation, harvesting, processing, and marketing related to

Plantation Plants.

Land use as regulated in the Law of the Republic of Indonesia Number 26 of 2007 concerning Spatial Planning, namely regulating land use based on the division of non- cultivated areas (protected areas) and cultivated areas, namely areas that can be utilized for economic purposes consisting of production forest areas, forest people, agriculture, fisheries, settlements, mining, industry, and other areas with the aim of being safe, comfortable, productive and sustainable.

The use of land for economic purposes in a sustainable and environmentally sound manner in an area cannot be separated from the responsibility of the government as an institution authorized by the state to regulate and develop natural and environmental resources that are intended for the welfare of the community as mandated in the Constitution Republic of Indonesia in 1945. This means that every activity within the state of Indonesia must obtain permission and or approval by the government in stages.

Based on the Regional Regulation of the Province of East Kalimantan Number 1 of 2016 concerning the Spatial Plan of the Province of East Kalimantan, a plantation area of

3.2 million hectares has been established. Each land use has different growing requirements, therefore land use planning must refer to the land capability class (Mujiyo et al, 2018). Likewise, the land that has been designated for this plantation area should have the appropriate land capability so that it can provide high economic value for the area. Therefore, land evaluation is very necessary in land use planning and regional planning, to see land performance so that it can help planners in determining the best land use (Djaenudin et al, 2003).

Geospatial analysis is a series of geospatial information processing processes as a tool in policy formulation, decision making and or implementation of activities related to terrestrial space (Law of the Republic of Indonesia Number 4 of 2011 concerning Geospatial Information). Therefore, geospatial analysis dominates the entire process of evaluating land resources (Steel, 2012).

Land capability indicates the magnitude of the constraining factors that limit the choice of land use and agricultural enterprises or the costs of improvement for their management. Land is grouped into classes I to VIII, meaning that the higher the grade, the worse the land quality (Hardjowigeno and Widiatmaka, 2007).

Land capability can be assessed for current conditions or after improvements have been made. More specifically, it is viewed from the physical characteristics of the environment consisting of climate, soil, topography, hydrology and drainage suitable for farming or productive plant commodities (Darmawijaya, 1997).

Geospatial analysis is strategic enough to be able to provide an overview of the area's production capabilities, as a basis for calculating the economic value of regional production. There are six key attributes with respect to land use types, namely:

1) Produce or type of use (eg plant species) or service (eg processing facilities);
2) Labor;
3) Capital;
4) Type of management;
5) Technology; and
6) Operational scale.

In addition to these six attributes, there are five other important aspects, namely:

1) Market orientation;
2) Infrastructure needs;
3) Size and distribution of land ownership;
4) Land ownership status; and
5) Per capita income standard.

Factors that influence land use are physical and biological factors, economic considerations and institutional factors. Physical and biological factors include the suitability of physical properties such as

geological conditions, soil, water, climate, plants, animals and population. Economic considerations are characterized by profits, market conditions and transportation. Institutional factors are characterized by land law, political conditions, social conditions and administratively enforceable.

Economic activity includes two aspects, namely aspects of production and aspects of consumption of goods and services. Production is an activity that produces goods and services, while consumption is the use of goods and services. On the other hand, the environment provides three main functions:

1) The place of return of waste (sink), i.e. any economic activity that produces waste or waste products.
2) As resources, nature provides raw materials that are transformed by using energy to produce goods and services.
3) As a source of pleasure or recreation (amenity services), namely providing services directly to consumers such as fresh air, substances needed for life, natural beauty, and other services.

The economic relationship with the production of natural resource goods shows that economic activity does not only pay attention to the economy of production and consumption but in accordance with available resources, but must also pay attention to the impact of economic activity on the preservation and quality of limited natural resources in order to be efficient and effective. for now and the future.

The level of availability and scarcity of natural resource goods provides an indication of how to manage scarce resources so as not to threaten their sustainability without or minimizing environmental degradation.

Economic valuation or better known as economic valuation can be interpreted as giving money value to natural assets that are not marketed where the resulting value has a certain meaning (Fauzi, 2014). The principle of economic valuation aims to provide economic value to the resources used in accordance with the real value from the community's point of view.

Thampapillai (1993) in Sanim (1997) asserts that the main purpose of the economic valuation of environmental goods and services (environmental goods and services) is to be able to place the environment as an integral component of any economic system. Thus, environmental valuation must be an integral part and sectoral priority in determining the balance between conservation and development.

In general, the assessment of natural resources is divided into two groups, namely use value and non-use value, where the concept of use value is divided into two groups, namely direct use value is economic value related to in situ utilization of resources. nature and the environment, such as use for consumption and recreation, and indirect use values, including protection of watersheds or the role of forests (Fauzi, 2014), while non-use values are values felt by the community or individuals towards environmental natural resources that are independent of the environment. current and future use. Legally, the concept of non-use value is recognized in America as a component that must be included in the assessment of environmental damage to natural resources.

Economic valuation of natural resources is defined as the process of quantifying and assigning economic value (valuation) to natural resources in monetary form after identification. The basic concept of implementing the economic valuation of the conditional area is in accordance with the concept of sustainable development. The implementation of the concept of sustainable development is supported by three main components, namely: social, economic and environmental. These components are interdependence, where all three influence each other and form an integral whole.

RESEARCH METHOD

Location and Time of Research

This research was conducted for six months from January to June 2020. The research locations were in ten regencies and cities in East Kalimantan Province, namely Kutai Kartanegara Regency, Berau, East Kutai, Mahakam Hulu, West Kutai, Paser, North Panajam Paser, Bontang City, Kota Samarinda, and the City of Balikpapan). This research is in collaboration with the GIS Laboratory of the Faculty of Agriculture, Mulawarman University and related agencies within the East Kalimantan Provincial Government.

Method of collecting data

Sources of data and information include primary and secondary data. Data were obtained from government agencies that handle plantation areas (Plantation Office, Statistics Office, District Office, Village Office, and other relevant sources). The data collected includes:

1) Company name and area of IUP for oil palm plantations;
2) The area of plasma plantations and the area of community gardens;
3) The number of oil palm farmer groups and the number of oil palm farmers;
4) Number of workers in large private plantations;
5) Oil palm production on large private plantations and smallholder plantations;
6) Regional supporting infrastructure and infrastructure; and
7) Spatial data which includes maps of money patterns, land use, land cover, erosion hazard, plantation permits, soil types and topography.

Models and Methods of Analysis

Spatial analysis includes overlapping operations of several maps including soil maps and topographic maps to produce maps of land units. Land characteristics data obtained from attribute data in the land unit map. The land capability evaluation method uses the matching method between land characteristics and land capability class criteria as presented in table 1.

TABLE 1 CRITERIA FOR LAND CAPABILITY CLASSIFICATION

Criteria	Land Ability Class							
	I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**
Top layer texture	t2/t3	t1/t4	t1/t4	(*)	(*)	(*)	(*)	t5
Undercoat texture	t2/t4	t1/t4	t1/t4	(*)	(*)	(*)	(*)	t5
Surface slope	l_0	l_1	l_2	l_3	(*)	l_4	l_5	l_6
Erosion state	e0	e1	e1	e2	(*)	e3	e4	(*)
Drainage	do/d1	d2	d3	d4	(**)	(*)	(*)	(*)
Effective depth	k0	k0	k1	k2	(*)	K3	(*)	(*)
Gravel/rock	b0	b0	b0	b1	b2	(*)	(*)	b3
Flood	O0	O1	O2	O3	O4	(*)	(*)	(*)

Determination of land capability is based on consideration of land characteristics with a level of suitability for land use patterns including slopes, sensitivity to erosion,

effective soil depth, soil texture, permeability, drainage, rock and rock outcrops, flood hazard, and salinity (Arsyad, 2010). This means that the higher the land capability class can limit the land use spectrum. Pay attention to table 2 regarding land capability class and land use intensity.

Land capability classes suitable for plantation crop cultivation include classes I, II, III, and IV while classes V to VIII are not suitable for plantation crops (Hardjowigeno and Widiatmaka, 2007).

TABLE 2 LAND CAPABILITY CLASS AND LAND USE INTENSITY

Land Ability Class		Land use intensity and tiger								
		Nature preserve	Forest	grazing			Agriculture			
				Limited	Currently	Intensive	Limited	Currently	Intensive	Very intensive
Barriers increase, suitability and choice of land use decreases	I									
	II									
	III									
	IV									
	V									
	VI									
	VII									
	VIII									

Economic valuation analysis on the use of resources in plantation areas to provide the overall economic value attached to the resource but also direct use value, indirect use value, option value and non-use value with the formula for resource value as follows:

TEV = UV+NUV
TEV = Total Ec. Value UV = Use Value NUV= Non-use Value

1) Direct Use Value is the value obtained through direct consumption of a Natural Resource (SDA);
2) Indirect Use Value is the value of indirect benefits generated by the existence of a natural resource;
3) Option Value is the value of direct and indirect benefits of a natural resource in the future;
4) Existence Value is the value of the existence of a natural resource, regardless of the benefits that may be obtained from the existence of the natural resource itself; and

Bequest Value is the value of the possibility of inheriting an SDA to the next generation.

RESULT AND DISCUSSION

Plantation Area Condition

The plantation area is an area that is determined based on the TGHK (Forest Utilization Agreement) and RTRWP (Provincial Spatial Planning). Plantation areas in East Kalimantan Province as stipulated in the RTRW of East Kalimantan Province for 2016-2036 are as follows;

1) Data on the area of the plantation area based on the RTRWP covering an area of 3,269,561 ha with 16 commodities and an area that has been encumbered with permits covering an area of 3,124,797 ha;
2) The leading plantation sector is oil palm with an area of 1,352,063 ha, divided into large plantations (nucleus) covering an area of 907,819 ha, smallholder plantations covering an area of 284,523 ha and non-

palm plantations covering an area of 159,725 ha;

3) Production of plantation products per year includes 20,053,284 tons of oil palm (FFB), 63,201 tons of rubber, 13,647 tons of coconut, 6,057 tons of pepper, and 2,435 tons of cocoa;
4) The area of the area that has been granted a location permit is 3,124,797 ha, which consists of:
   a. IUP covering an area of 2,596,622 ha with a total of 330 companies, 189 companies have obtained HGU covering an area of 1,176,698 ha;
   b. 141 companies have IUP without HGU area, 141 companies have location permits that have no progress based on permits and 47 companies have IUPs covering 528,175 ha;
   c. 61 companies did not realize IUP, 35,354 ha, 13 companies did not realize the HGU area of 55,088 ha; and
   d. Unused land is 691,184 ha.
5) The number of factories is 82 units with an installed capacity of 4,535 FFB tons per hour, used capacity of 4,130 tons per hour with CPO production of 2.89 million tons per year.

The plantation area is part of an area that has an economic function, an ecological function, a socio-cultural function that has the ability as a building platform. Activities within the area are regulated by laws and regulations based on the principles of benefit, integration, togetherness, openness, justice and sustainability.

Plantation Area Suitability

The results of the analysis of land capability in the plantation area obtained 2,440,367 ha suitable for plantations, while the remaining 739,044 ha were not suitable for plantations. The distribution by district/city is presented in table 3.

There are at least 23% of the plantation area that is not suitable for plantation crops because it has land capability classes V to VII. The land has a high limiting factor and requires high improvement efforts (Mujiyo et al, 2018).

The characteristics of the land that are the main limiting factors for management are the slope of the land is rather steep to steep, the state of heavy erosion and very poor soil drainage. These limiting factors are permanent and difficult to repair.

A high land capability class can limit the intensity of land use. Land is not suitable for agricultural crops in general, including plantations, but is suitable for grazing and forests (Rahman et al, 2015). If forced to use plantations it can cause land degradation. If there has been degradation, it will take a long time to recover. Land capability does not only depend on geomorphological parameters and soil fertility but will also depend on inputs and management actions (Mondal and Mondal, 2015).

TABLE 3 SUITABILITY OF PLANTATION AREAS BASED ON LANDCAPABILITY ANALYSIS

No	Regency/City	Area (ha)	
		Compatible	Not compatible
1	Balikpapan	840,3	17,2
2	Berau	287.228,1	94.942,9
3	Bontang	749,8	325,3
4	Kutai Barat	425.613	58.716
5	Kutai Kartanegara	585.435	108.291
6	Kutai Timur	639.105	234.214

7	Paser	291.069	94.648
8	Panajam Paser Utara (PPU)	65657,8	12977,8
9	Mahakam Ulu (Mahulu)	136.681	121.133
10	Samarinda	7.989	13.780
	Total	**2.440.367**	**739.044**

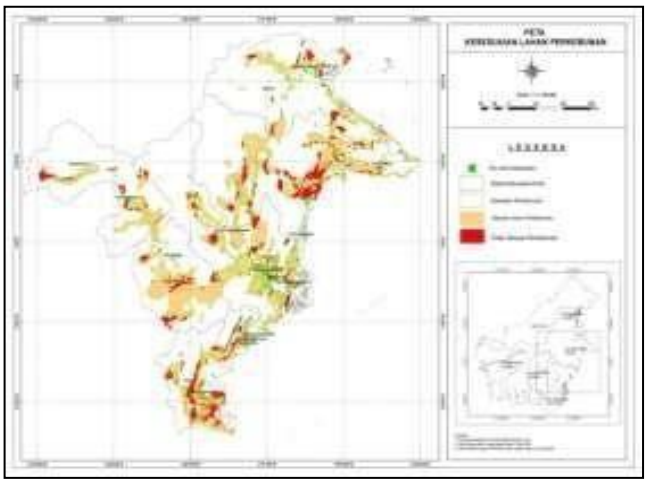
The presence of a number of inappropriate lands in this plantation area causes the use of land in the plantation area to be not optimal. Efforts to utilize the land require improving the characteristics of the land with a high level of management to make it suitable for plantation commodities. This of course raises high investment costs so that there are still quite a lot of plantation areas that have not been utilized. Even if the land is forced for plantations, production will not reach a profitable level, in addition to the emergence of the threat of land degradation (Steel, 2012). The distribution of plantation area utilization by Regency/City in East Kalimantan is presented in Figure 1.

TABLE 4 PLANTATION AREAS PER REGENCY/CITY IN EAST KALIMANTAN PROVINCE

No	Description	Province	Berau	Kutai Timur	Kutai Kartanegara	Kutai Barat	Mahulu	PPU	Paser	Samarinda	Balikpapan	Bontang
1	Spatial plans for plantations (Ha)	3,269,561	405,645	881,661	715,397	487,288	275,725	80,758	398,945	22,186	880	1,076
2	Land that has been encumbered with a plantation permit											
	a.Land area (Ha)	3,120,347	388,325	815,624	687,619	497,610	278,788	115,888	336,494	-	-	-
	b.Number of Permit	377	64	138	60	36	20	16	43	-	-	-
3	Area of Plantation Commodities	1,352,063	137,661	473,316	253,013	190,451	22,721	65,995	200,258	2,757	5,730	161
4	Oil Palm Planting Area	1,192,342	126,011	453,556	217,285	142,053	19,962	49,451	182,586	1,332	34	72
5	Core Garden Planting Area	907,819	92,650	352,882	189,657	121,226	19,862	30,406	101,116	-	-	20
6	Planted Area of Plasma (Ha)	284,523	33,361	100,674	27,628	20,827	100	19,045	81,470	1,332	34	52
7	Non-palm planting area (Ha)	159,725	11,650	19,760	35,728	48,398	2,759	16,544	17,672	1,426	5,699	89
8	Current Percentage of Plasma Area (Ministry of Agriculture 98 of 2013 article 15)	25.09	18.46	22.36	16.59	12.56	3.41	5.64	42.77	0.00	0.00	0.00

Source : East Kalimantan Plantation Office (2019)

FIGURE 1 MAP OF SUITABILITY OF PLANTATION LAND IN PLANTATION AREA



Sources : Development Planning Board Kalimantan Timur (2016)

The potential of plantation areas based on the output of both derivative products, the ability of the average national productivity in plantation areas in East Kalimantan is still not optimal, shown in Table 5. Potential Production of Plantation Areas.

TABLE 5 PRODUCTION POTENTIAL OF PLANTATION AREAS

No	Plantation Commodities	Total existing area (Ha)	Area potential (Ha)	Spatial plans area (Tons)	Production realization (Tons)	Average production (Ton/Ha)	Production standard (Tons/Ha)	Potential production (Tons /years)
1.	Palm oil	1.192.342	2.596.622					
	a. fresh fruit bunch			53.957.805	20.053.284	16,8	20,78	24.780.000
	c. crude palm oil			11.845.897	4.040.000			5.440.201
	d. Kernel			2.697.890	658.216			1.239.000
	e. POME			31.457.400	11.691.065			14.446.740
	f. Fiber			7.769.924	2.887.673			3.568.320
	g. empty bunch			11.331.139	4.211.190			5.203.800
	h. palm meal			2.266.228	842.238			1.040.760
2	cocoa	7.778			2.435	0,3	0,70	5.445
3	rubber	115.160			63.510	0,6	0,80	92.128
4	coconut	22.289			13.467	0,6	1,00	22.289
5	pepper	9.012			6.057	0,7	0,60	5.407
6	coffee	2.725			325	0,1	0,70	1.908

Production capability in the leading sector (palm oil) is 24 tons per ha per year with a yield of 20-24 percent. The data above shows that the productivity of fresh fruit bunches (FFB) is currently only at an average of 16.8 tons of FFB per ha per year, this production can still be increased by 20-24 tons of FFB per ha per year with a production of 24.7 million

tons. The results of FFB production will affect the yield of CPO and Kernel as raw materials for advanced industries. Kernel production (palm kernel) has not been properly recorded by the Plantation OPD, as well as the potential for waste that can be a source of revenue.

The economic potential of the plantation area has economic benefits both directly and indirectly in the activities that occur in the plantation area, the value of the use of the area that has an impact on economic activities based on production activities and their derivatives. As in table 6 the Economic Potential of the Plantation Area.

The economic value of the area is taken into account in every investment activity as well as the results of production activities and their derivatives. As in the table above, the economic value of the existing potential for Fresh Fruit Bunches products can still be increased by Rp. 32.2 trillion of value by increasing the productivity of both the nucleus plantations and the community by fulfilling production inputs, both increasing human resources and increasing natural resources. Economic activities from FFB products have a considerable impact on production activities and their derivatives considering that FFB itself is a basic product in oil palm plantations. The activity in question is as described in the production activity.

TABLE 6 ECONOMIC POTENTIAL OF PLANTATION AREAS

No	Plantation Commodities	Existing Economic Value (Rp) (000,000)	Economic Value of Existing Potential (Rp) (000,000)	Regional Potential Economic Value (Rp) (000,000)
1	Palm oil			
	a. fresh fruit bunch	23.198136	32.214.000	80.936.708
	c. crude palm oil	26.589.950	57.122.113	113.311.304
	d. Kernel	3.093.615	10.407.600	22.905.088
	e. POME	389.702	481.558	1.048.580
	f. Fiber	202.137	249.782	543.895
	g. empty bunch	842.238	1.040.760	2.266.228
2	Cocoa	87.660	196.006	901.626
3	Rubber	1.397.220	2.026.816	4.661.677
4	Coconut	47.135	78.012	468.069
5	Pepper	635.985	567.756	3.406.536
6	Coffee	5.200	30.520	64.092
	Total	56.488.978	104.414.923	230.513.803

The disparity in the economic value of community gardens with nucleus plantations has a large enough difference, where community gardens only contribute 16% of the economic value of nucleus plantations. In CPO, the existing economic value is Rp. 26.6 trillion with an export value in 2018 of 201,321 tons worth US$ 109.5 million. For Kernel, the existing economic value is Rp. 3 trillion about 30% of the potential value, the export value of kernels in the first quarter of 2020 is Rp. 80.38 billion. Activities in plantation areas require various supports to increase the value of benefits that can be felt directly by planning, monitoring and controlling the area so that it can be optimal and there will be no leakage from sharing sources of income. The identification of the economic value of the area becomes a reference for the actual and potential economic value of the area from the plantation area.

CONCLUSIONS

The plantation area in East Kalimantan is still not fully utilized according to its designation because about 23% is not suitable for plantation crops with a slope of more than 30 percent.

The potential economic value of the plantation area for each commodity and its derivative products for oil palm fresh fruit bunches is Rp. 80.9 trillion, while its derivative products are worth Rp. 145 trillion, while for commodities such as cocoa, rubber, coconut, pepper and coffee it is worth Rp. 9.5 trillion.

RECOMMENDATIONS

1) The area of land that is not suitable for plantation land can be used as conservation land to maintain the ecosystem of the area

2) To optimize the benefits of the value of the regional economic potential, the regions need to plan for all sectors, both upstream and downstream, so that the regional economic potential can be sustainable; and

3) Plantation area planning must be more measurable, realistic, useful, participatory, open, integrated and accountable based on geospatial analysis and the economic value of the area

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