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Study in East Borneo Province

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ABSTRACT
The supply of palm oil in East Kalimantan Province does not only come from state-owned and private plantations but also smallholders. The palm oil value chain analysis was conducted in three districts in several palm oil companies and their suppliers. CPO and PKO production data are taken through secondary data and have been processed. The company has a core business in the field of processing crude palm oil (CPO) derived from fresh fruit bunches (FFB) owned by its plantations and from farmer groups around the oil palm plantation and oil palm processing (PKO) areas. The capacity of crude oil processing plants (CPO) varies from the lowest, 30 tons FFB/hour to 90 tons FFB/hour. The purpose of this study was to analyze the CPO supply value chain of several companies in East Kalimantan Province. Observational data are taken directly in the field and secondary data. The CPO generated by Oil Palm Mill is used for two of its activities: vegetable oil, and B. non-vegetable oil. Vegetable oil is used for cooking oil and margarine. However, non-vegetable oils are used in biodiesel (for renewable energy) and soaps, and shampoos. Kernel aims for his two activities: The use of cosmetics, perfumes, or drugs.

Keywords: *Value-Chain, Palm Oil, plantation, Fresh Fruit Bunch (FFB).*

1. INTRODUCTION

Oil palm is the main agricultural commodity to produce vegetable oil when compared to other agricultural commodities. However, problems arise from the massive conversion of land functions for oil palm plantations. Social and environmental problems also arise as a result of the development of the palm oil industry but do not make this agricultural commodity stop its development. In palm oil producing countries, the development of oil palm plantations has an important impact on the development of the country's economic development, including in efforts to alleviate poverty in rural areas and encourage local infrastructure development. In reality, economic development from the palm oil industry causes a lot of harm to human rights interests and coupled with deforestation in the regions. Horizontal conflicts between companies and community groups or indigenous peoples, forest fires and peatlands are some examples [1], [2].

More than half of the world's palm oil supply is produced in Indonesia and Malaysia. Both countries supply more than 90 percent. India and China are the world's largest importers of palm oil. The U.S. and the European Union are importers of palm oil, accounting for 13% of the world's total palm oil supply. Products derived from palm oil are not only for cooking oil, but also for other industrial products such as cosmetics, detergents, animal food, etc. Multinational industry players such as Kraft, Ikea, and McDonald's and Unilever need a large-scale supply of palm oil. There are difficulties in tracing the supply of FFB for the basic ingredients of the palm oil industry. This is because the supply of FFB for palm oil mills does not only come from their own plantations but also from farmer groups and local communities. Value chain analysis (VCA) in CPO companies in Indonesia is needed with the aim of improving the value chain of a company's products and assisting in the efficiency of the company's operational costs. Value chain analysis consists of supply chain and value chain analysis [3].

The issue of sustainability is a major issue in palm oil production and development activities. Currently, this issue is the main discussion and is closely related to the socio-economic development of a country and environmental problems that arise due to palm oil processing as well as land conflicts between companies and indigenous groups, air pollution, and climate change problems caused by greenhouse gas emissions [4]. In projections made by IFPRI (International Food Policy Research Institute) that there is almost twice the increase in the land area of oil palm plantations in the next 40 years. Palm oil is the main source of income in Indonesia and is followed by oil and gas as well as the tourism sector. The palm oil industry has a bright future where the world is currently heading towards renewable energy use and has a high trade value. Therefore, this industry requires qualified human resources and high competitiveness [5], [6]. Competition between palm oil companies in producing palm derivative products will create a variety of products found in the market while maintaining quality and affordable prices for consumers.

Indonesia and Malaysia are increasing the production of FFB yields per hectare from year to year. Oil palm productivity in the 1960s was around 2 tons/ha and then expanded due to the development of agriculture in the field of plant breeding and genetics such as producing superior oil palm varieties [7]. In Malaysia there was a nearly double increase of 4.3 tons/ha, but production in Indonesia was still lower. In addition to the two main countries, the average global palm oil production reaches 2.4 tons/ha. There are exceptions for producing countries in the African region where production is still unsatisfactory. Field research has been carried out and obtained results for FFB productivity reaching 6 tons / ha. However, these results are difficult to implement due to the gap in yield which is associated with three factors, namely: lack of efficiency in terms of plantation development, poor management of plant nutrients and nutrients and lack of GAP practices in oil palm cultivation management [8].

In Indonesia, oil palm plantations were first established in 1911 on the Sungai Liput (Aceh) and Raja Island (Asahan, North Sumatra). Then it developed in the East Coast region of Sumatra. There are three main categories of oil palm plantations in Indonesia: State-owned plantations known as PTPN (Smallholders owned by members of the public or plasma; and private companies, consisting of national and multinational companies. Data as of 2018 states that the total land area of oil palm plantations in Indonesia reaches 14.36 million ha with a proportion of 55% of land controlled by private companies and 41% of smallholder plantations.

The palm oil industry is an important source of foreign exchange for Indonesia (after oil and gas). It not only has an impact on economic growth and helps in poverty alleviation programs in rural areas. In addition, it causes negative effects on landscape changes and decreases in the rate of forest cover. Palm oil companies from Malaysia and Singapore began to expand their business wings and expand their business units to the African continent (Central Africa and West Africa region). However, in its development there are many problems related to the availability of land, skilled labor, and adequate infrastructure [9].

In the late 1970s the construction of farmer groups began with the help of funding from the World Bank. Then it developed into a plasma farmer scheme in the early 1980s through the Inti Rakyat Plantation (PIR) project. Within a decade there was an increase around oil palm plantations increased by almost 400% from an area of 294,560 ha in the 1980s to 1.1 million ha in 1990. It then increased to 2 million ha in 1995 and grew to 4.1 million ha in 2000. Data in 2015 showed that the area of oil palm plantations in Indonesia reached 11.3 million ha.

Indonesian and Malaysian palm oil products are mostly exported abroad to the European, Indian and Chinese markets. ITC data (2016) shows that there were 40 million tons of CPO and its derivative products traded on the international market in 2014. Where 53% of the total palm oil supply comes from Indonesia and is followed by Malaysia 35%. The main importers of palm oil are India (19.4%), China (13%), the Netherlands (6.1%), Pakistan (5.8%) and Italy (4.3%). The development of new renewable energy use in the European Union has made the need for palm oil increase in the form of biodiesel. Recorded from statistical data shows that in 2014 45% of total palm oil imports were used in the transportation sector (Transportation and Environment 2016).

Value chain actors operate under certain constraints and opportunities. This includes availability and access of resources, connectivity within and between companies, availability and use of knowledge and technology, and markets. In addition, the availability and quality of support services in the form of transportation, storage and financing at each stage can drive costs and revenues and ultimately determine profit margins as the product moves down the chain. This assessment provides insights to help understand the market, understand the value chain structure and operations, and develop a vision and strategy for value chain growth. [10] Value chain analysis presents an organization as a continuous process of value-creating activities. Values fall into two categories: Main activities and supporting activities [9]. Key activities related to raw material sourcing, processing, and marketing were evaluated. Support activities consist of the provision of industrial support infrastructure and human resources [10]. Value chain analysis is used to identify stages in the value chain where industries can add value to consumers and optimize costs [11]. Value chain analysis was originally the analysis of value-creating activities inside and outside a company [12].

Eme (2008) states that value chain analysis is a tool to facilitate the study of business activities regarding new value creation opportunities related to existing value associated with input procurement, production, processing, and final product delivery. said to be a tool. Developing value chains has become a credible tool for promoting sustainable investment in agriculture. The agricultural value chain starts with the production of raw materials, connects them to processing, receives the final product, markets it, sells it to end users or consumers, and after waste disposal, adds value to the final product. consists of activities. However, value chain analysis starts from the end market perspective to determine the desired products and how actors can share the most value along the chain to manufacture those products. [10].

From the description above, it can be seen that value chain analysis is needed to see how the production process and derivatives of palm oil and the efficiency process needed in the palm oil production process. The purpose of this study was to analyze the supply of CPO from several oil palm plantation companies in East Kalimantan Province.

2. MATERIAL AND METHODS

A value-added analysis was performed on the plantation part with additional inputs regarding the number of seeds, other additives, and the amount of oil palm fruit produced. Also, processing plant parts that are further processed in the manufacturing process or related to material processing. A value chain analysis (VCA) was conducted by multiple companies in his three districts of East Borneo. Palm oil mill capacity started from 30 tons/hour to 90 tons/hour. A source of fresh fruit bundles (FFB) from plantations and smallholders. The VCA ran from December 2020 to January 2021.

3. RESULT AND DISCUSSION

Value chain analysis was carried out in 3 districts in East Kalimantan. The company has a core business in the field of processing crude palm oil (CPO) which comes from fresh fruit bunches (FFB) belonging to its plantations and from farmer groups around the area of oil palm plantations and processing palm kernels oil (PKO). The capacity of crude oil processing plants (CPO) varies from the lowest, which is 30-ton FFB/hour and the highest is 90 tons FFB/hour.

No.	Company	Capacity (Tonnes of FFB /Hour)	Sources		Production: Cernel (Ton) in 2019	Production in 2019 CPO (Ton)
			Own	Farmers		
1	Oil Palm Companies	30-90	**1,273,625**	**98,501**	**61,564**	**362,302**

The hierarchy of the oil palm plantation business value chain is divided into 2 parts, namely:

3.1. Main Activities

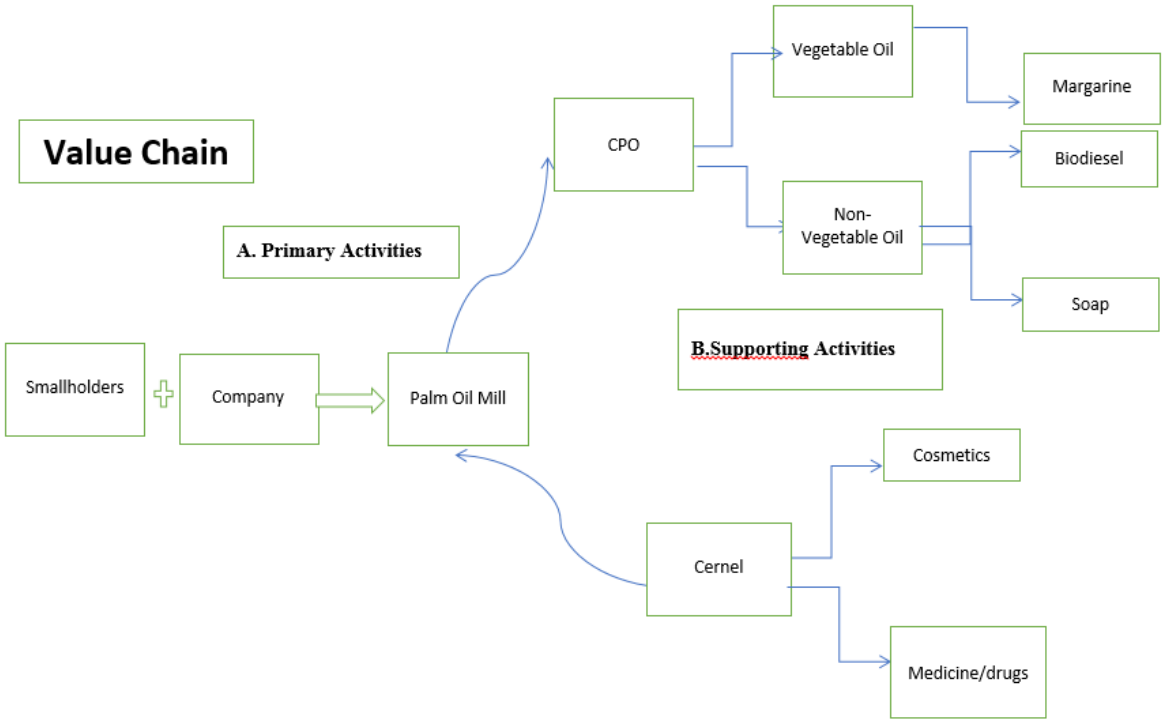
Includes oil palm cultivation activities and produces FFB obtained from own plantations or farmer groups and then sends the FFB to processing factories to be processed into CPO (crude oil) and PKO (kernel oil).

3.2. Supporting Activities

The results of CPO processing can be divided into two parts, namely

- Vegetable oil can be processed into cooking oil and margarine
- Non-Vegetable Oil can be processed into renewable energy (biodiesel) and soap

Meanwhile, the processing results of kernel oil processing (PKO) can be used as cosmetics and medicines. The palm oil industry value chain hierarchy can be seen below:



4. CONCLUSION

Based on the research, it can be concluded that the Indonesian oil palm industry value chain can be divided into two parts: A. Primary Activities and B. Support Activities. The main activity in the production of CPO (Crude Palm Oil) FFB (Fresh Fruit Bunch) was by palm oil plantation companies and smallholder farmers. The CPO generated by Oil Palm Mill is used for two of its activities: a vegetable oil, B. non-vegetable oil. Vegetable oil is used for cooking oil and margarine. However, non-vegetable oils are used in biodiesel (for renewable energy) and soaps and shampoos. Kernel aims for his two activities: Use of cosmetics, perfumes, or drugs.

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