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KATA PENGANTAR

Salam,

Dengan mengucapkan syukur kepada Allah Tuhan Yang Maha Esa, kami terbitkan Agrotek edisi September 2021. Di tengah pandemi yang berkepanjangan ini, ilmuwan Indonesia masih tetap berkarya. Pada edisi kali ini 32 artikel hasil penelitian, yang terdiri dari 11 artikel dari bidang pengolahan pangan dan nutrisi, sistem manajemen, rantai pasok, dan pengendalian kualitas; 3 artikel tentang rekayasa pangan, dan 2 artikel tentang manajemen limbah. Para penulis berasal dari berbagai institusi pendidikan dan penelitian di Indonesia.

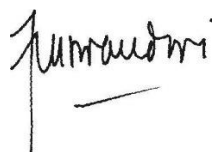
Kami mengucapkan terima kasih kepada para penulis dan penelaah yang telah bekerja keras untuk menyiapkan manuskrip hingga final. Kami juga berterimakasih kepada ibu dan bapak yang memberi kritik dan masukan berharga bagi Agrotek.

Untuk menyiapkan peringkat jurnal Agrotek di masa depan, kami berharap kontribusi para peneliti untuk mengirimkan manuskrip dalam bahasa Inggris. Semoga kita akan mampu menerbitkan sendiri karya-karya unggul para ilmuwan Indonesia.

Selamat berkarya.

Salam hormat

Prof. Umi Purwandari





ANALYSIS OF SUPPLY CHAIN CRUDE PALM OIL (CPO) IN KUANTAN SINGINGI DISTRICT

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ABSTRACT

The purpose of this study was to analyze the supply chain management of CPO in Kuantan Singingi a stream of goods (goods flow), the flow of money (money flow) and the flow of information (information flow), and knowledge factors that affect the smoothness of the CPO supply chain. The research method used is descriptive qualitative. This study uses primary data and secondary data. Primary data is in the form of data obtained from the company, interviews with stakeholders (farmers, the Department of Agriculture, Association of Indonesian oil palm farmers, and other parties), who are involved either directly or indirectly in the CPO supply chain in the company, while secondary data is in the form of journals and other documents. The flow of goods in the CPO supply chain consists of suppliers, including independent smallholders and smallholders who sell FFB to collectors. These company nuclei are directly brought to the palm oil mill. Then the factory processes the FFB into CPO and is sent to several companies that process derivative products. The financial flow starts from consumers to farmers in cash and non-cash. The flow of information begins from farmers to consumers who provide information in FFB selling prices and CPO prices. Transportation is one factor affecting the smooth supply chain of CPO in Kuantan Singingi District.

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INTRODUCTION

Oil palm development in Riau Province is a potential local resource utilization activity. This is supported by various factors, such as the suitability of the agro-climatological conditions and the availability of suitable land resources. Based on the Central Bureau of Statistics data, the total area of oil palm plantations in Riau Province is 2,572,858 ha.

Sub-sectors plantations, especially oil palm, in the supply chain activities are divided into two parts, namely upstream and downstream. Upstream activities include plantation activities, marketing of fresh fruit bunches (FFB), and agro-industrial infrastructure. In contrast, downstream activities include palm oil processing factories (PKS), crude palm oil (CPO) stocks, kernels (palm kernel), and export activities. Upstream activities will support activities in downstream activities. Riau Province has 12 districts, Kuantan Singingi District is in the 5th position, which has an area of coconut plantation and oil palm industry.

Kuantan Singingi District is a district that has a very significant development of oil palm areas. The high growth of oil palm in Singi district is owned by the private sector and smallholder plantations in recent years. Based on the Central Statistics Agency (2019) data, Kuantan Singingi District has an oil palm plantation area of 82,503 ha and 129,157 tonnes/year. 20 operating mills process palm oil production in Kuantan Singingi District to produce CPO.

Business decisions of business actors in industrial supply chain networks in Indonesia are generally still individual. They are not thoroughly coordinated because each actor has different goals or information is subject to delays and distortions. As a result, each actor thinks about the benefits of his own business (Copra dan Meindl, 2004). This condition is different from the ideal condition for implementing supply chain management. Each business actor coordinates directly through sharing information transparently in making decisions that aim to satisfy consumers with achieving efficiency in the overall supply chain.

Each of these actors will form a supply chain network. The supply chain is a complex network consisting of several organizations with different goals and interests (Hadiguna, 2016). The supply chain for CPO includes farmers, collectors, palm oil mills to customers. According to Negara et al.

(2017), the supply chain is a concept of implementing an integrated logistics system. Three types of flows must be managed in the supply chain: material flows, financial flows, and information flow (Siswandi et al., 2019). The purpose of this study was to analyze the supply chain management of CPO in Kuantan Singingi District in the form of goods flow, money flow, and information flow and to find out the factors that affect the smoothness of the CPO supply chain.

METHOD

The research method used is descriptive qualitative. This study uses primary data and secondary data. Primary data is in the form of data obtained from the company, interviews with stakeholders (farmers, the Department of Agriculture, Association of Indonesian oil palm farmers, and other parties), who are involved either directly or indirectly in the CPO supply chain in the company, while secondary data is in the form of journals and other documents. The research was carried out by observing and analyzing the entire CPO supply chain from the plantation to the CPO processing factory.

RESULT AND DISCUSSION

General Description

Indonesia is listed as a world palm oil producer. More than 50% of the world's palm oil has been produced in Indonesia (Papilo et al., 2020). The research location is located in Kuantan Singingi District. Kuantan Singingi District is one of the regencies in Riau Province, Indonesia, with the capital city of Teluk Kuantan. Geographically, geoeconomically and geopolitically, Kuantan Singingi District is located in the middle route across Sumatra and is in the southern part of Riau Province. Kuantan Singingi District is a division of Indragiri Hulu District, which was formed based on Law no. 53 of 1999 concerning establishing the Regencies of Pelalawan, Rokan Hilir, Rokan Hulu, Siak, Natuna, Karimun, Kuantan Singingi, and Batam. Palm oil is one of the plantation crops cultivated by the local community. The total area of oil palm plantations is 82,503 ha, and a total production of 129,157 tons/year. Palm oil production is processed into crude palm oil (CPO). The following is a list of the Kuantan Singingi palm oil processing industry.

Palm Oil Supply Chain System

Material, information, and financial coordination are needed to meet customer needs to increase the overall competitiveness of the supply chain (Stadtler dan Kilger, 2005). Oil, palm supply chain, is a relationship pattern that describes the flow of fresh fruit bunches (FFB) from a group of actors consisting of independent smallholders, traders / non-PB platforms, traders/platforms. PB owners, based on the results of a field survey in the form of interviews with stakeholders in the CPO supply chain in Kuantan Singingi District, it is found that the existing supply chain conditions for CPO products in the form of the flow of goods, finance and information can be seen in Figure 1.

a. Goods Flow

Flow of goods/materials or goods flow that have occurred continuously at the producer level to the final consumer (Mustaqim et al., 2018). CPO processing companies obtain fresh fruit bunches (FFB) supplies from several supplier sources, namely from company-owned plantations, plasma plantations, and community-owned oil palm plantations (swadaya). These fresh fruit bunches originating from community-owned farms (swadaya) cannot be directly sold to palm oil mills (oil palm processing). Still, they must go through collectors, including small collectors and prominent collectors who have fruit delivery letters (SPB) issued by CPO processing companies. As a condition for supplying FFB to the company.

Meanwhile, the FFB, which comes from plasma plantations, is managed by a cooperative collaboration with the company in providing

seeds, fertilizers, and insecticides. This FFB can be sent directly to CPO processing factories without intermediaries. Besides the company receiving *supplies* from plasma plantations and community plantations, most of these CPO processing companies in Kuantan Singingi District have their oil palm plantations and are managed independently. FFB originating from company-owned farms and plasma plantations is not sorted during the initial processing of CPO. Still, FFB originating from independent smallholder plantations undergoes a sorting process, separating FFB that conforms to the company's quality standards and those that are not suitable, as seen in plain view. Eyes by sorting workers (such as empty, unsanitary bunches, abnormal forms of FFB, etc.). FFB rejected by the company will be returned to the prominent collector, so that the net weight calculated is only FFB by company standards.

Furthermore, the FFB is processed at the CPO processing plant. It is known that the CPO processing factory in Kuantan Singi District consists of state-owned mills which private-owned mills manage. In Kuantan Singingi District, there are several private companies, including those that only have CPO processing factories. For companies that only process CPO, the CPO is sent directly to other companies to be processed again into food and non-food products; besides that, the company also acts as a CPO exporter. The smooth flow of FFB from farmers to consumers is influenced by the balance between supply and demand (Husnarti dan Handayani, 2021).

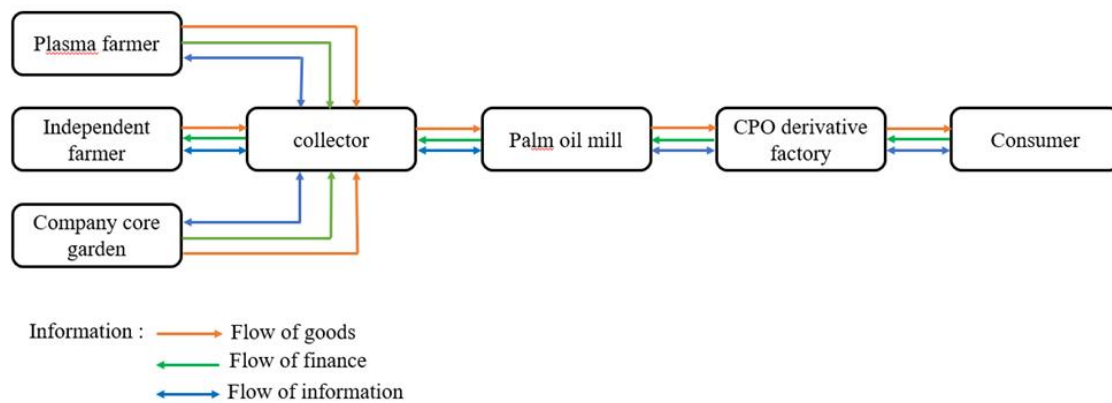


Figure 1 Supply chain oil palm flow in Kuantan Singingi

Table 1 Flow supply chain in the Palm Oil supply chain of each stakeholder in Kuantan Singingi District

No	Actors	Flow of goods	Flow of information	Flow of cash
1	Independent farmers	Sell FFB to collectors	<ul style="list-style-type: none"> • Requires information on the price of FFB from the collector • Providing information on the amount of FFB to collectors 	Realized selling price of FFB
2	Plasma farmers	Selling FFB to collectors (cooperatives)	<ul style="list-style-type: none"> • Requires information on the price of FFB from the cooperative • Requires information on the amount of FFB produced by the plasma plantation from the cooperative. 	Realized selling price of FFB
3	Collectors	<ul style="list-style-type: none"> • Receive TBS from independent farmers • Sell TBS to agro-industry 	<ul style="list-style-type: none"> • Require information on the price of FFB from the agro-industry • Provide information on the amount of FFB collected to PKS 	<ul style="list-style-type: none"> • Realized selling price of FFB • The purchase price of TBS
4	Palm Oil Processing (PKS)	<ul style="list-style-type: none"> • Receive FFB from cooperatives and collectors • Selling CPO 	<ul style="list-style-type: none"> • Provides information on the price of FFB from the Plantation Office • Provide information on the amount of CPO produced to CPO derivative processing factories 	<ul style="list-style-type: none"> • Realized purchase price for FFB • Realized selling price of CPO • Realized export price CPO
5	CPO Expeditions	<ul style="list-style-type: none"> • Receive CPO from PKS • Sending CPO to factory refinery 	<ul style="list-style-type: none"> • Requires information on the amount of CPO to be transported • Require information on the area of delivery of the CPO 	<ul style="list-style-type: none"> • Realization of CPO shipping price

b. Money Flow

Transactions carried out are relatively simple, namely, farmers will meet collector traders and also the procurement/purchase of an agro-industry (Probowati et al., 2021). Flow includes all information on the flow of money flowing from consumers (end users) to farmers (Siswandi et al., 2019). Money flow starts from importers, exporters, traders, collectors, and farmers. The payment system from the importer to the company is cash and non-cash if non-cash payment is made 2-4 months after the product arrives. Payment from companies to collector traders in money and payments from collectors to farmers in cash which is calculated based on the weight and quantity (Suud et al., 2021). The payment system in the CPO supply chain is done in cash or by transfer (Saputra, 2012).

c. Information Flow

Information flow includes all matters related to the information provided and required (reciprocally) by each actor in the supply chain elements. Farmers need information about the price of FFB from collectors and provide information about the amount of FFB harvested. From the collector's point of view, information is needed on the FFB price set by the agro-industry and information on the amount of harvest production. Meanwhile, Agroindustry needs information on the amount of FFB supply from collectors, plasma, and nucleus estates. The agro-industry provides information on the price of FFB that the company has set to collectors and plasma. The flow of information and communication is integrated between members of the supply chain. Data flows from the end consumer to the farmer and vice versa. This information is usually information on price, quantity, and quality

(Siswandi et al., 2019). The flow of information in the form of information on requests, production, scheduling, design, and others (Mustaqim et al., 2018). For more details, the form of CPO supply chain information flow showed in Table 1.

Based on the description of the oil palm supply chain in Kuantan Singingi, there are several areas where success factors can be developed. The garden chain is one of the success factors of the supply chain because from here, the supply chain system starts. Plantation management is by the Standard Operating Procedure (SOP) to not cause losses and decrease the quality of oil palm (Septarianes, 2020).

Transportation from farm to factory is one part of the supply chain. Adequate and suitable means of transportation so that there are no shipping errors that cause delays. Pay attention to the loading of oil palm on the truck capacity to not interfere with transportation to the mill. Efforts are made to distance the plantation to the mill a short road. This results in high transportation costs and causes the price received by farmers for FFB to be below. The condition of damaged traffic lanes is also a factor that will cause delays in delivery and a decrease in the quality of FFB due to transport trucks stuck on damaged roads (Siregar et al., 2020).

Assurance that the FFB received is by the standards applicable to the processing plant. Production planning and production capacity must be planned appropriately and informed. This will affect all production activities. If the planning is not correct, it will result in excess FFB piling up in the *loading ramp* and the storage tank capacity that cannot accommodate CPO due to excess production. Production equipment and machines must be well maintained because the production process will stop, resulting in late delivery of CPO and unable to meet consumer needs on time.

Transport from mills to storage tanks and consumers is the last part of the oil palm supply chain system. Consideration of delivery time and considering the condition of damaged traffic lanes is one of the success factors at this stage. The route from Kuantan Singingi to Dumai port, Teluk Bayur is damaged. This will significantly affect the supply chain system. The management of stockpile tanks at the port must also be considered so that CPO can be sent directly to consumers when the ship arrives. An inaccurate distribution

process can significantly impact all aspects, mainly profits (Siregar et al., 2020).

CONCLUSION

The flow of goods in the CPO supply chain consists of suppliers, including independent smallholders and smallholders who sell FFB to collectors. The company's nucleus plantations are directly brought to the palm oil mill. Then the factory processes the FFB into CPO and is sent to several companies that process derivative products. The financial flow starts from consumers to farmers in cash and non-cash. The flow of information begins from farmers to consumers who provide information in FFB selling prices and CPO prices. Transportation is one factor affecting the smooth supply chain of CPO in Kuantan Singingi Regency.

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