p-ISSN: 1907-8056
e-ISSN: 2527-5410
AGROINTEK
Jurnal Teknologi Industri Pertanian
journal homepage: journal.trunojoyo.ac.id/agrointek

Identification and analysis of actors in the supply chain of post-harvest tools (case study: teratak village, kampar district)

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Article history
Received:
18 October 2022
Revised:
21 October 2022
Accepted:
17 November 2024

Keyword
Post-Harvest Tools;
Supply Chain;
SWOT

ABSTRACT

There is still a lack of clear understanding regarding the structure of the supply chain for palm oil post-harvest tools in Teratak Village, including the flow of goods, money, and information as well as the roles of each actor in that supply chain, even though the demand for these tools is quite high and important to support the productivity of oil palm plantations. This study aims to analyze and define the supply chain structure of post-harvest tools for oil palm from upstream to downstream. This study was carried out in Teratak village, Kampar Regency. Methods used are qualitative descriptive and BPMN (business process modeling notation) methods. *Based on the study's results, it is known that the post-harvest tooling supply chain structure for oil palm starts with iron purchasing suppliers, independent blacksmith industries, blacksmith cooperatives, distributors, and consumers. From these factors comes the flow of goods, the flow of information, and the flow of money. All these factors are interrelated. The strategy that can be applied in this case is to optimize all relevant factors, namely iron collectors, blacksmith industry, blacksmith cooperatives, and distributors, to increase productivity in each element.*

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DOI 10.21107/agrointek.v20i1.17168

INTRODUCTION

Oil palm plantations in Riau Province in 2020 covered an area of 2,695,680 hectares (Riau Provincial Plantation Office 2020). Meanwhile, the total palm oil production of Riau province in 2020 will reach 294,102 tons. Of course, based on data on plantations, post-harvest tools are needed to support oil palm productivity.

Oil palm post-harvest equipment is the equipment used in the oil palm harvesting process. The most widely used post-harvest tools for oil palm are dodos and egrek. The use of egrek and dodos differs from the age of the oil palm harvesting. Dodos are used to harvest oil palm fruit that is less than 8 years old and has a maximum palm height of 5 meters. Egrek is used to harvest oil palm fruit over 8 years old with a palm height of more than 5 meters. The shape of the dodos blade resembles an axe (Christian et al. 2018). The shape of the blade may resemble a sickle.

Dodos and egrek are two types: manual and mechanical. In this study, the production of post-harvest tools from the Blacksmith center was done in dodos and, for example, craft. Craft tools require human-powered propulsion. These handmade dodos and egrek are among the main post-harvest tools produced by Micro, Small, and Medium Enterprise (MSME) for post-harvest tools in Teratak Village, Kampar Regency, Riau province. These MSMEs are very fertile in Riau Province, especially Kampar Regency, as the majority of the people of the province are oil palm farmers. The demand for this forging center's post-harvest products is relatively high. Among them are oil palm farmers, village traders, district traders, and industry. In this study, we can see a supply chain analysis of post-harvest tools for oil palm.

A supply chain is a network or chain of cooperation to supply or distribute a product until it is accepted by the final consumer (Fadhlullah et al. 2018). The purpose of the supply chain is to satisfy the needs of the customer while maximizing the profits of the actors involved in the supply chain (Chopra and Meindl 2016). Supply chains include many players or stakeholders, both directly and indirectly involved.

Supply chain analysis is an activity that examines or analyzes networks or things in the supply chain. Supply chain analysis aims to find stakeholders involved in the supply chain that can describe the supply chain structure of a product (Kembey et al. 2016). Supply chain analysis describes the stakeholders involved, what role each stakeholder plays, and how the flow of goods, money, and information takes place in the supply chain (Pramana et al. 2021).

Based on the above description, it is crucial to analyze the supply chain of the post-harvest oil palm tools in Teratak Village to give the community an overview of the existing structure in the supply chain. Furthermore, information happens in the supply chain. Therefore, this study aims to analyze the existing supply chains of post-harvest tools for oil palm trees in Teratak Village, especially those related to the flow of goods, money, and commodities. In addition, this study also aimed to map the activities performed by each stakeholder in the supply chain of post-harvest tools for oil palm.

METHOD

This study used primary data sources. Data were obtained from in-depth interviews with several MSMEs with post-harvest tools for oil palm in Teratak Village, Kampar Regency, Riau Province. The data is then processed using qualitative descriptive and BPMN (business process modeling notation) methods.

This study uses a descriptive qualitative approach to determine the supply chain structure and the flow of goods, money, and information in the supply chain. In addition, this study also uses the BPMN method to describe the activities and roles of each stakeholder. The BPMN method can detail the flow of goods, money, and information (Valacich and Goerge 2017; Wasson 2018). Where the flow is coming from and who the stakeholders are responsible or involved in each process can be clearly defined through the BPMN.

RESULT AND DISCUSSION

Post Harvest Tool Supply Chain System

The post-harvest tooling supply chain for oil palm is a relationship model that describes the post-harvest tool delivery flow and relationships with supply chain stakeholders. The supply chain has three flows: material flow from upstream to downstream, financial/money flow from downstream to upstream, and information flow from upstream to downstream or vice versa

(Negara et al. 2017). The flow of goods, money, and information that occurs in the company is an integrated chain of activities starting from the raw material to the consumer. It is related to three aspects: sourcing, production process, Etc. Manufacture and distribute products (Mizani and Azis 2021). From the results of direct observations and interviews with stakeholders in the supply chain of post-harvest tools for oil palm in Teratak Village, Kampar Regency, the actual conditions of the supply chain of post-harvest tools for the products oil palm in the form of the flow of goods, information, and cash flow can be seen in the following figure.

Goods Flow

The activities start with converting natural resources and raw materials into products distributed to the final consumer (Yulian et al. 2019). The palm oil post-harvest tool makers in Teratak Village make post-harvest tools and receive additional products from the independent Blacksmith industry. Furthermore, for marketing, they merged into one. Sales of the product by self-covering all cities in Indonesia are supported by marketing through e-commerce. According to Agusti et al. (2020), supply chain entities include products and markets. In addition, many consumers also go directly to MSMEs to purchase these products with a word-of-mouth strategy so that people can directly purchase palm oil harvesting equipment from the producer or, e.g., cooperatives. Blacksmith in Teratak Village, Kampar Regency. So, the price, if we buy directly from the supplier, will be much lower than that of buying elsewhere.

Furthermore, this MSME Blacksmith in Teratak Village has also entered into a Memorandum of Understanding or cooperation with PTPN V to provide post-harvest tools for oil palm trees. The MoU includes quality, quantity, and delivery time. Therefore, some products from these small and medium enterprises can be sent directly to PTPN V every year.

Cash Flow

Cash flow includes buying and selling post-harvest tools for oil palm. Cash flow starts from buying and selling transactions between distributors, the Blacksmith industry, Blacksmith cooperatives, and consumers. In this case, every entity has the right to buy and sell directly to consumers. Following the primary data obtained on-site, the payment system is made in cash and phases depending on the agreement between the two parties. At the time of ordering, an initial payment or down payment of 50% is made, and the remainder is paid after the post-harvest equipment is ready to be sent. Sales handling is based on the price of raw materials used, labor wages, production costs, and other costs.

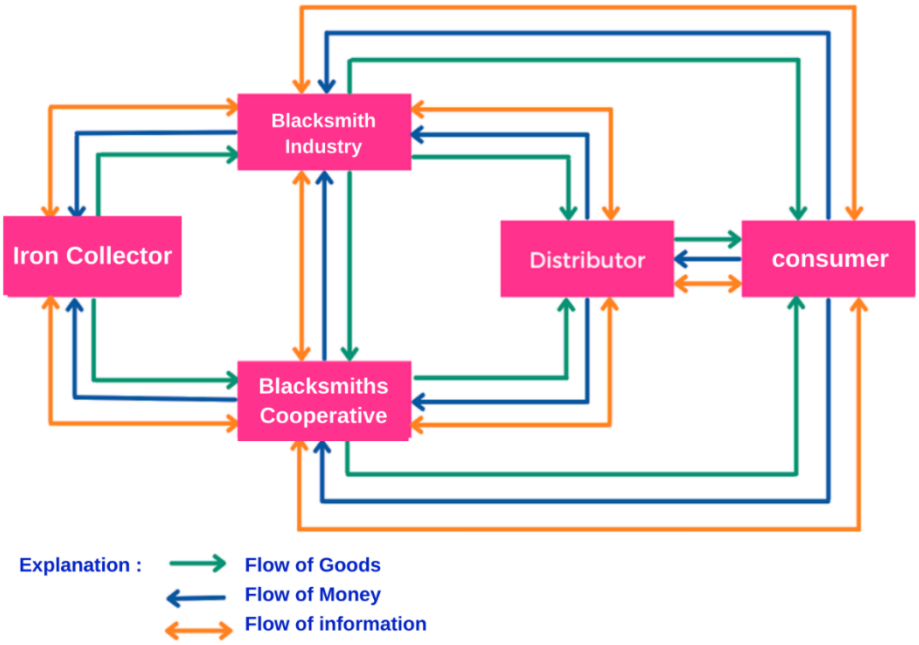


Figure 1 Supply Chain Flow of Palm Oil Post Harvest Tools

Table 1 Flows in the Post Harvest Tool supply chain of each stakeholder

No	Stakeholder	Flow of Goods	Flow of Information	Flow of money
1	Iron collector (raw material)	Selling iron (raw materials) to independent blacksmith industries and cooperatives	Provides iron price information from collectors Provides iron count information to the collector	The realization price of selling iron
2	Independent blacksmith industry	Selling post-harvest tools to distributors, cooperatives, or consumers	Provide information on the selling price of post-harvest tools Provides information on the number of post-harvest tools produced by the self-sufficient blacksmith industry	Realization price of selling post-harvest tools The realized price of buying iron
3	Blacksmiths cooperative	Receive post-harvest tools from the self-sufficient blacksmith industry Selling post-harvest tools to distributors or consumers Making post-harvest tools	Provide information on the selling price of post-harvest tools Provides information on the number of post-harvest tools produced by the blacksmith cooperative Provides post-harvest tool quality information	Realization price of selling post-harvest tools The realized price of buying iron
4	Distributor	Receive post-harvest tools from the independent blacksmith industry and blacksmith cooperatives. Selling post-harvest tools to consumers outside the region	Requires information on the number of post-harvest tools to be distributed or marketed Requires destination area information	Realization of the selling price of post-harvest tools Post-harvest tool shipping costs. Shipping costs are determined by weight and delivery distance.
5	Konsumen	Receive post-harvest tools from the blacksmiths cooperative (PTPN V) Receive post-harvest tools from blacksmith cooperatives and self-made blacksmith industries (single consumer) Receive post-harvest tools from distributors	Receive information regarding the price, quality, and quantity of post-harvest tools.	Realization of the purchase price of post-harvest tools

Information Flow

Information flows include everything related to information provided and requested (reciprocally) by each actor in the supply chain element. The collector provides information related to the price of raw iron, then provides information about the quantity of iron, Etc. Furthermore, the Blacksmith industry provides information on the selling price of post-harvest tools directly to consumers and to distributors. Forging cooperatives provide information on selling prices, quality, and quantity of products to distributors and consumers. Distributors also need information from Blacksmith cooperatives and the Blacksmith industry about the quantity of palm oil post-harvest tools distributed. Distributors also need information regarding the region or destination of consumers purchasing post-harvest tools. Price, quality, and availability information

are also needed to support supply chain operations.

Business Process Modeling Notation (BPMN)

The BPMN describes the role of each stakeholder involved in the supply chain. The post-harvest tools supply chain for oil palm consists of five stakeholders. They are the iron collectors, MSME/post-harvest tools industry, cooperatives, distributors, and consumers. The most crucial role in the supply chain is the industry because these actors determine the quality of post-harvest equipment and the selling price. Coordination among members is based on the perception that the strength of a supply chain depends on the strength of all its factors (Indriani et al. 2019). Iron collectors have a role in collecting iron from the community. The collected iron is then sold to MSMEs/industry as a raw material for making post-harvest tools. The industry then sells the products to cooperatives, distributors, and customers. Cooperatives play the role of purchasing post-harvest tools from SMEs/sectors. Products purchased by the cooperative can then be sold to distributors and customers.

The customer plays the role of purchasing post-harvest tools from SMEs, cooperatives, or distributors. Distributors play the role of purchasing post-harvest tools from SMEs and cooperatives. Furthermore, products purchased by distributors are sold to customers. The BPMN is detailed in Figure 2 below.

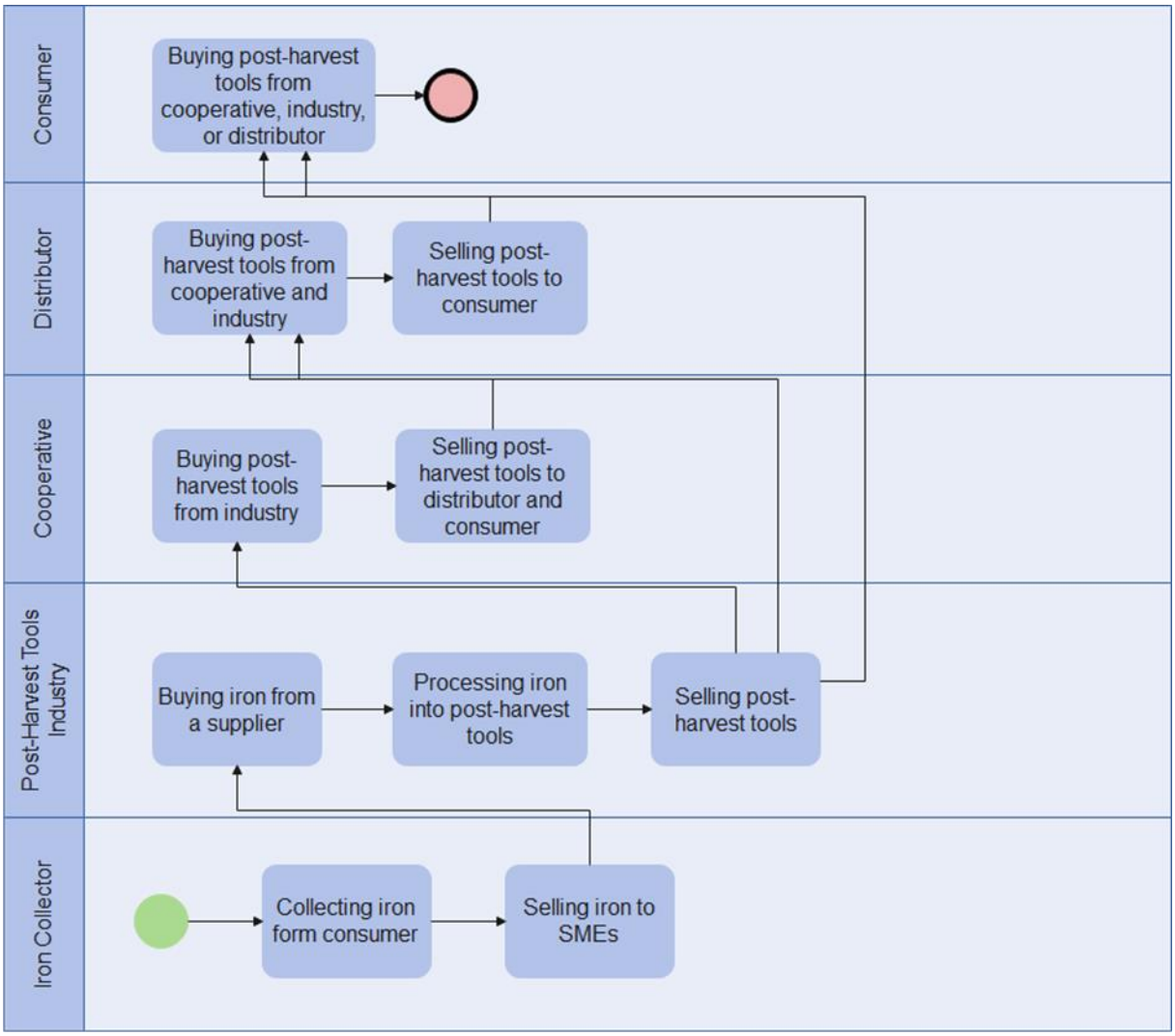


Figure 2 BPMN supply chain for oil palm post-harvest tools

CONCLUSION

Based on the supply chain of the post-harvest oil palm tools in Teratak Village, Kampar Regency, all the elements involved in this supply chain are essential as all factors are involved. To each other, we can see from the supply chain diagram. The actors in the post-harvest supply chain include iron collectors, blacksmith cooperatives, the independent blacksmith industry, distributors, and consumers. Goods flow occurs from iron collectors to consumers, while financial flows occur from consumers to iron collectors. The flow of information occurs reciprocally. The strategy that can be applied in this case is to optimize all relevant factors, namely iron collectors, the blacksmith industry, blacksmith cooperatives, and distributors, to increase productivity in each factor.

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