

ANALYSIS OF PALM SUGAR SUPPLY CHAIN WITH A FOOD SUPPLY CHAIN NETWORK APPROACH

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ABSTRACT

This study aims to determine the status of palm sugar supply chain in Rambah Tengah Barat Village, Rambah District, Rokan Hulu Province through an approach Food Supply Chain Network. The focus of the study was palm sugar production in Rambah Tengah Barat Village, Rambah District, Rokan Hulu Province. The research method is carried out in a purposive sampling, The data types used are primary data and secondary data. The study phase analyzed the palm sugar supply chain in Rambah Tengah Barat Village, Rambah District, Rokan Hulu Province through an approach Food Supply Chain Network starting from looking at supply chain objectives, existing supply chain structure, business processes down to resources in the brown sugar supply chain. The results show that the distribution model of the supply chain starts from farmers, collectors, retailers, stores and end consumers. Institutional strengthening among farmers is needed by forming groups of asphalt farmers to produce jaggery that can satisfy consumer demand. Production capacity is very limited and the use of technology is simple.

Keywords: *Palm sugar, supply chain analysis, food supply chain network.*

I. INTRODUCTION

1.1 Background

Indonesia is a country that has abundant natural resources in the form of agricultural land and plantations. In supporting food security, Indonesia's wealth of natural resources, especially in the plantation sector, can be done by maximizing the available natural resources. One of the plantation crops that have economic value is sugar palm. Sugar palm plants can grow evenly in Indonesia, one of the sugar producing areas, namely Rokan Hulu Regency, Riau Province. The area of palm land in Rokan Hulu sub-district is 12 ha spread across 3 sub-districts including Rambah Samoo sub-district has an area of 4.00 ha with a total production of 5 tons of palm sap per year, Bangun Purba sub-district has a land area of 4.00 ha with total production 5 tons per year and Rambah District 4.00 ha with a total production of 6 tons of palm sap per year (BPS Rokan Hulu, 2017).

The highest production of palm sap is in Rambah District with a total production of 6 tons per year. In the process, palm sap is processed to extend the shelf life and then to give more value to the palm sap to be processed into palm sugar or commonly called by the people as onou sugar. Palm sap is used as raw material for agro-industry, the agro-industry in Rambah District is still small-scale, and farmers' income is still low. This is due to the not yet optimal utilization of the palm plant and the technology used in the process is still traditional (Purba and Fahrial, 2022). So it is necessary to do further analysis regarding the palm sugar supply chain in Rambah District. The analysis was carried out starting from looking at supply chain objectives, existing supply chain structures, business processes to resources in the palm brown sugar supply chain. The brown sugar agro-industry has information difficulties, namely the certainty of consumer demand, the sale and purchase price of palm sugar is not fixed and the availability of market share and the production of palm sap are less stable.

The food sector is a very complex sector that is influenced by industrial, technological, economic, social and political factors that can shape food availability. Entities in the food supply chain aim to improve chain functions, quality, competitiveness and price (Dani, 2015). Supply chain management has a very important role in a business process (Probowati, et.al 2021). Supply chain is an effective strategy in improving business competitiveness. Comprehensive development of supply chain management can increase competitiveness (Perdana & Kusnandar, 2012).

1.2 Purpose of the research

This study aims to determine the condition of the palm sugar supply chain in Rambah Tengah Barat Village, Rambah District, Rokan Hulu Regency through the Food Supply Chain Network approach.

II. RESEARCH METHODS

2.1 Techniques and Data analysis

Methods The research was carried out in the brown sugar agro-industry in Rambah Tengah Barat Village, Rambah District, Rokan Hulu Regency. The location selection was carried out deliberately using purposive sampling based on consideration of the condition of the research area which is one of the producers of palm plants and produces palm sugar. The type of data used in this study consisted of primary and secondary data. Primary data were obtained from in-depth interviews with palm brown sugar supply chain actors and direct observation or observation at the research location. Secondary data obtained from the research location. The following is a supply chain descriptive analysis framework:

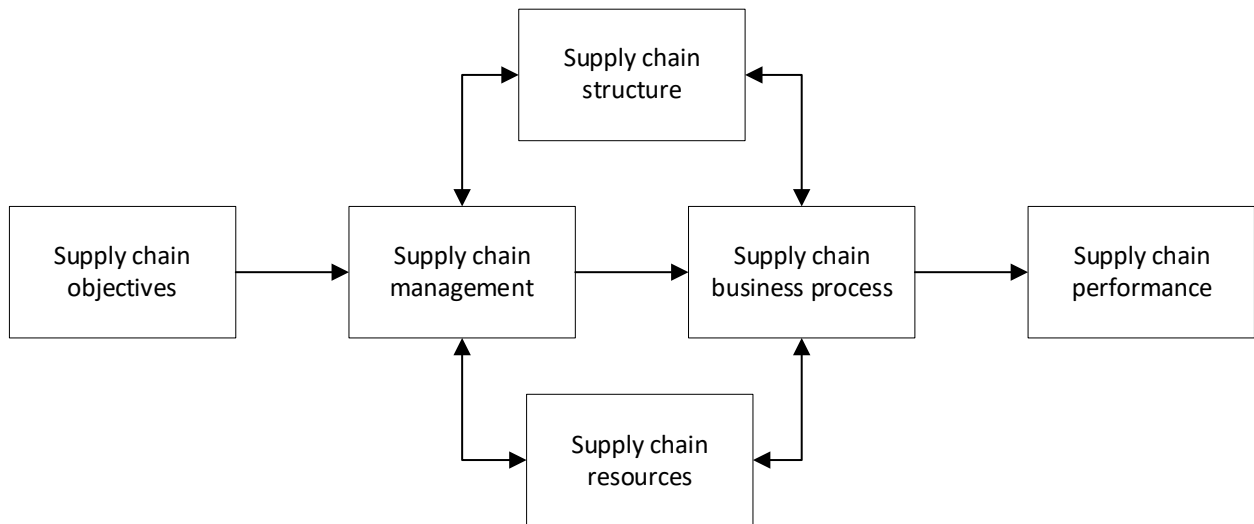


Figure 1. Supply Chain Descriptive Analysis Framework (Van der Vorst, 2006)

III. RESULTS AND DISCUSSION

3.1 Targets of the Palm Sugar Supply Chain

3.1.1 Target Markets

The target markets for the distribution of palm sugar are aren shops, retail or retailers consisting of small traders, consumers at the regional level and outside the region. Currently, it is still fulfilling consumer demand at the regional level and some requests from collectors, retailers and aren shops.

3.1.2 Development Goals

Development targets that must be carried out by the palm brown sugar agroindustry in Rambah Tengah Barat Village by strengthening partnerships in the palm brown sugar agroindustry. Development of process technology from traditional to modern technology using agricultural machinery.

3.2 Supply Chain Structure

The structure of the palm sugar supply chain starts from palm farmers as raw material providers, processors as palm sugar producers, then distributed to collectors who buy palm sugar from farmers, forwarded to retailers and palm shops, then forwarded to final consumers.

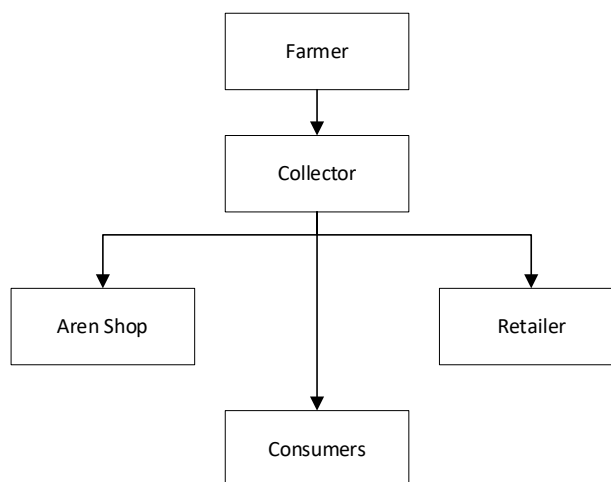


Figure 2. Supply chain structure

3.2.1 Primary members of the palm sugar supply chain

Primary members are actors or supply chain actors who are directly involved in business activities (Setiadi et al., 2017). The primary members in the palm brown sugar supply chain are farmers as providers or suppliers of palm sugar, collectors are the second party in the supply chain sub-chain, aren shops, retailers and final consumers. According Yunita *et.al* (2019) the shorter the supply chain, the more efficient the marketing chain.

3.2.2 Secondary members of the palm sugar supply chain

Secondary members are the parties that support the supply of the necessary raw materials. Starting from the needs of cultivation, production equipment to product packaging. The relationship between farmers, traders and goods suppliers input production and post-harvest needs are limited to casual, non-cooperative or cooperative consumer relationships specifically (Setiadi et al., 2017).

3.3 Palm sugar supply chain business process

3.3.1 Palm sugar supply chain business process relationship

In the palm sugar supply chain there are four cycles namely procurement, Manufacturing, Replenishment, and customer orders. Farmers as raw material providers also carry out the manufacturing process for processing palm sugar into palm sugar. Collecting traders carry out grading and packaging of palm sugar. Collector traders carry out a procurement cycle for partner farmers to respond to consumer requests. Orders are made directly by collecting traders to farmers or by communication via cell phones. The replenishment cycle is carried out by the retailer and aren shop, the replenishment cycle is included in the pull process. The customer order cycle is carried out by consumers by ordering directly from retailers and aren shops.

3.3.2 Pattern of distribution

In the palm sugar supply chain, there is a pattern of distribution or flow of products including the flow of goods, the flow of money and the flow of information as follows:

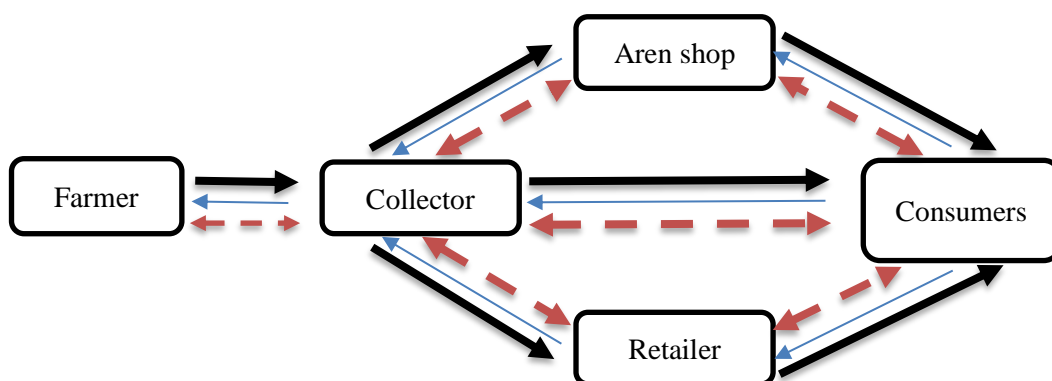


Figure 3. Pattern of distribution

According to Pujawan (2005) the supply chain consists of three kinds of distribution patterns, namely the flow of goods, the flow of money (financial) and the flow of information. the flow of goods flows from upstream to downstream starting from farmers as palm sugar producers who distribute their goods to consumers. The flow of money flows from downstream to upstream, namely from consumers to producers. The flow of information can move from two directions starting from upstream to downstream and vice versa. Farmers distribute their produce in the form of palm sugar to the collecting

traders according to the demands of the collecting traders. The price of palm sugar is sold by farmers to collectors at Rp. 22,000/kg. Collector traders make payments in cash to farmers. Collectors are the second party in the palm sugar supply chain. Collector traders provide purchase price information to farmers. Collector traders sell palm sugar to retailers, aren shops to the final consumer. Collector traders sell palm sugar for IDR 30,000/kg. Collectors carry out the process of grading and packaging palm brown sugar so that they incur costs in the process. Based on the observations that have been made, it is known that payments are made in cash and there are no pending payments from each chain. The flow of information in the palm sugar supply chain is very open because farmers have private palm trees and it is easy to coordinate between farmers and collectors so that information distortion does not occur. Meanwhile, the flow of information from collectors to retailers, aren shops and end consumers is not widely open, resulting in information distortion.

3.3.3 Collaborative planning

In the collaborative planning process it is necessary to strengthen institutions among farmers by forming palm sap farmer groups so that the resulting palm sugar production can meet consumer demand.

3.3.4 Aspects of risk

The risk most often experienced by farmers is the raw material for palm sap which is very easily fermented so it needs to be processed more quickly so that it can be used in making palm sugar. Besides that, other risks that affect the production of palm sugar are climate and weather factors that can affect the results of tapping palm sap.

3.4 Supply chain resources

3.4.1 Physical resources

Physical resources owned by farmers are places where palm sap is produced into palm sugar. The palm sap production site is located close to the sap plantation location so that once the palm sap is harvested it can be processed immediately to anticipate the fermented palm sap.

3.4.2 Technology resources

Limited production capacity and processing complexity. Palm sugar production is carried out on a home industry scale where the workers are family members. Production capacity is very limited and the use of technology is still simple. In the process of processing palm sap into palm brown sugar, it takes 2.5 hours to 3 hours to process and producers (farmers) are only able to produce once. The upstream sector industry has the expertise and willingness to produce primary products, but their mastery of technology is limited. Processing technology plays an important role in agro-industry and broad market aspects can also assist in product marketing so that product demand increases (Hadi, 2014).

IV. CONCLUSION

In the palm sugar supply chain in Rambah Tengah Barat Village, Rambah District, Rokan Hulu Regency, based on the FSCN approach, the actors involved in the supply chain are farmers (producers), collectors, retailers, and aren shops. The supply chain distribution flow patterns include the flow of goods, the flow of money (financial) and the flow of information. Based on this flow pattern, there are problems in the flow of information from collectors to retailers, aren shops and end consumers that are not widely open, resulting in information distortion. One important factor in the business process is the building of trust between all actors in the supply chain.

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