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Analysis of Supply Chain Management in an Attempt to Escalate Black Tea Production at PT Perkebunan Tambi Wonosobo, Central Java

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ABSTRACT

Objective: *This study aims to analyze the role of supply chain management (SCM) in addressing production constraints and increasing black tea production at PT Perkebunan Tambi, where demand exceeds supply, causing operational inefficiencies.* ***Methods:*** *A descriptive qualitative approach was employed, involving systematic observations, documentation, and interviews with key informants from the production and marketing divisions. This approach enabled a detailed analysis of phenomena affecting supply chain activities and production processes.* ***Results:*** *The findings indicate that the implementation of SCM at PT Perkebunan Tambi is suboptimal due to recurring constraints in key areas, including machinery reliability, transportation of tea shoots, workforce readiness, and inventory management. The primary bottleneck lies in the aging machinery, which, despite regular maintenance, fails to perform effectively, leading to production delays and reduced output. These challenges hinder the alignment of production capacity with market demand, creating a supply-demand gap.* ***Novelty:*** *This study highlights the critical link between aging infrastructure and supply chain inefficiencies, emphasizing the need for strategic machine renewal and improved inventory management to sustain continuous operations and meet growing market demands. The research provides actionable insights into overcoming production challenges through enhanced SCM practices, contributing to the literature on supply chain optimization in tea production industries.*

INTRODUCTION

The challenges for companies are increasing as market competition intensifies, companies are working hard to improve competitiveness through product customization, high quality, cost reduction and speed of response to the market, they will put additional pressure on the supply chain. The cost of marketing a product can be very high because it includes many activities, such as product forecasting, demand forecasting, raw material procurement, production, inventory management, storage, and distribution to distributors. With the increase in production carried out, it will put additional pressure on the supply chain. (Puput Tri Hamidah, 2019)

With the application of the concept of supply chain management in the company can provide several benefits, such as customer satisfaction, increased revenue, reduced costs, asset utilization efficiency, increased profits, and greater business development (Sucahyowati, 2011). The main objectives of supply chain management are to shorten the supply chain cycle, develop or improve services, and reduce costs and prices (Muhammad Arif, 2018).

PT Perkebunan Tambi is a company engaged in tea plantation, processing, and trading. The increasing competitiveness of industrial companies in the current era makes industrial companies compete with each other to provide the best production results. As

is the case with PT Perkebunan Tambi which is working hard to improve its competitiveness through product adjustments, improving quality, reducing production costs, and increasing rapid response to market demand.

PT Perkebunan Tambi has its own tea plantation as the main raw material supplier in the tea making process. In the production process, PT Perkebunan Tambi produces two types of tea, namely black tea and green tea. Good and correct garden maintenance will certainly provide a good quality tea leaf harvest. Vice versa, maintenance that is not maximized will produce poor quality as well.

Supply chain management activities at PT Perkebunan Tambi have been running well, but in the process there are obstacles related to the supply of black tea products. The demand for black tea at PT Perkebunan Tambi is always higher than the supply, this is due to a number of things such as machine constraints, raw material quality, human resources, and weather.

Tahun	Total Permintaan Teh Hitam	Total Persediaan Teh Hitam	Selisih Permintaan dan Persediaan	
	(KG)	(KG)	(KG)	(TON)
2018	2.632.559,97	938.310	1.694.249,97	1.694,25
2019	2.609.326,79	975.376	1.633.950,79	1.633,95
2020	2.730.512,26	1.261.629	1.468.883,26	1.468,88
2021	2.680.198,01	1.254.118	1.426.080,01	1.426,08
2022	3.280.000,54	1.285.457	1.994.543,54	1.994,54

Based on the table above, there is a difference between demand and supply starting from 2018 - 2022. In 2018 the total difference was 1,694.25 tons of black tea, then in 2019 it was 1,633.95 tons of black tea, then in 2020 the total difference was 1,468.88 tons of black tea, then in 2021 it was 1,426.08 tons of black tea. In the following year, 2022, there were 1,994.54 tons of black tea. Which is where the difference between demand and supply is almost 50%. With a large difference, it can affect customer satisfaction, as described in ISO 9001: 2015, a quality management system standard that discusses how to maintain the quality of the supply chain to maintain product quality and customer satisfaction.

RESEARCH METHOD

In conducting this research using descriptive qualitative methods. This approach aims systematically and accurately to describe phenomena, facts, or events related to the characteristics of a particular population or region (Hardani, 2020). Research informants

are people who know or actors who are directly involved with this research problem, namely the production and marketing divisions

RESULTS AND DISCUSSION

A. Supply Chain Management Analysis on Black Tea Production

1. Suppliers

The supplier selection process aims to determine suitable suppliers in order to meet the company's needs and minimize the risk of inventory shortages. Supplier selection is an important activity in the procurement department to achieve competitive advantage. This process involves various factors, where each factor is used for different purposes and often the information is not known with certainty and precision. In order to optimize supplier selection, it is necessary to find other criteria that are relevant to the company's objectives. Supplier selection involves many criteria, including quality and quantity factors such as delivery quality, past performance, warranty, price, engineering capability, and financial condition. The right supplier can provide quality raw materials, affordable prices, and on-time delivery. Factors such as price, service, promptness of delivery, and trustworthiness are also the basis for supplier selection.

PT Perkebunan Tambi is a company engaged in tea plantation, processing, and trading. PT Perkebunan Tambi has its own garden planted with tea plants to be the main raw material for the processing process. To meet the increasing consumer demand, PT Perkebunan Tambi cooperates with Perhutani to expand the land managed by LMDH (Lembaga Masyaratk Desa Hutan), the expansion is at six points, where three titi have produced while the other three are still under maintenance.

In addition to Perhutani, PT Perkebunan Tambi requires outside suppliers to fulfill the fuel used in the milling and drying process. The most commonly used fuel is firewood, on the grounds that it has the lowest purchase price compared to others, but during the rainy season firewood is usually difficult to find so the company uses other fuels, namely using gas fuel, although at a fairly higher price but by using gas fuel it will reduce smoke pollution that can pollute tea.

2. Manufactures

PT Perkebunan Tambi is a manufacturing company that processes raw materials into finished goods that are ready for distribution. In the black tea production process, it goes through a shorter stage than green tea. The black tea production process starts from picking tea shoots in the garden, then brought to the factory by truck, weighing, withering, enzymatic oxidation, drying, sorting, until it becomes a finished product.

In the production process, it involves qualified human resources, raw materials that are in accordance with company standards, machine readiness, and excellent tea shoot transportation equipment. The most common obstacle that arises in the production process is the machine, the old age of the machine results in frequent obstacles that hamper the production process. For example, such as in the drying stage, at UP Tambi there are three drying machines, but at one time all three were not used at the same time, this was because the other two machines were under repair. With the existence of machine constraints during tea production, it results in production time being longer than expected.

This has an impact on delays in product delivery to customers and increases operational costs due to these delays. With the delay in product delivery, it will further accumulate demand that should have been fulfilled. Therefore, it is very important to immediately handle this machine constraint so that the production process can return to running smoothly and efficiently, so that it can meet market demand on time.

3. Distribution Logistics

Distribution logistics is the process of delivering goods from factories to end consumers through a network of distributors, warehouses, and transportation systems. According to Donald Walters (2003), logistics is a function that involves moving and storing materials on their way from the initial shipper, and organizing the movement of goods, through the supply chain and also to the end customer. The logistics distribution process includes the efficient and effective delivery, as well as the flow and storage of goods, services, and information from the point of origin to the point of consumption, with the aim of meeting consumer needs appropriately.

In the distribution process, PT Perkebunan Tambi provides two services, namely regular retail and manufacturing or export. For retail, the distribution is carried out to agents or market traders then only to end users. Then for exports, the company will make shipments only up to shipping or commonly called FOB, so the cost is finished until the ship.

The company will cooperate with several expedition parties according to the request of the buyer. The expedition will deliver the goods to the customer with a note that during the process of shipping goods damage and others are the responsibility of the expedition. Before handing over the goods to the expedition, the marketing department will first check the condition of the transportation that will be used, for example, such as the cleanliness of the vehicle, whether there are holes or not because cross-contamination can occur which can cause product damage.

Distribution of black tea products is carried out to various regions. For local retail, it is distributed in the Wonosobo-Central Java area, while for bulk export packaging it is distributed to Poland, Malaysia, Japan, the Netherlands, and the Middle East. As a result of demand exceeding supply, the distribution of black tea was delayed which resulted in complaints from consumers.

B. Supporting and Hindering Factors of Supply Chain Management in Increasing Black Tea Production
   1. Supporting Factors for Supply Chain Management in Increasing Black Tea Production
      1) Expanding the land
      2) Conducting fertilizer innovation
      3) Combining production processes
      4) Cooperate with third parties for transportation
   2. Inhibiting Factors of Supply Chain Management in Increasing Black Tea Production
      1) Machine breakdown
      2) Quality of raw materials
      3) Transportation
      4) Weather.

CONCLUSION

Fundamental Finding: This study identifies significant inefficiencies in supply chain management (SCM) at PT Perkebunan Tambi, particularly in black tea production. The primary challenges include aging machinery, inadequate transportation systems, inconsistent human resource performance, and poor shoot quality management, all of which contribute to the persistent inability to meet high market demand. **Implication:** The findings underscore the critical need for strategic investment in infrastructure renewal, particularly machinery, as well as the development of more robust SCM practices, including transportation optimization and workforce training. Addressing these issues is essential for aligning production capacity with market demands and reducing operational disruptions. **Limitation:** This research focuses exclusively on qualitative data from internal operations, potentially overlooking external factors such as market dynamics and competitor strategies, which may also influence the company's performance. **Further Research:** Future studies should incorporate a quantitative approach to measure the impact of specific SCM improvements on production output and profitability. Additionally, comparative analysis with other tea production companies could provide broader insights into best practices and innovations in supply chain optimization.

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