



Inventory Control Analysis of PT Gunung Sugih Tapioca Flour

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ABSTRAK

In 2022, PT Gunung Sugih faced challenges managing raw material inventory, leading to high total costs. This study investigates if inventory control serves as an effective policy for optimal levels and cost reduction. Employing observation, interviews, and documentation, the research employs the Economic Order Quantity (EOQ) method to assess orders, safety stock, reorder points, and total inventory costs. Results reveal the EOQ method minimizes costs, suggesting 281 tons for safety stock and 611 tons for reorder points, contrary to the company's undefined values. EOQ method yields a total inventory cost of Rp.58.18 million, saving 28.54% compared to the company's policy (Rp.81.42 million). The study advocates EOQ as a more optimal approach for cassava raw material inventory control

INTRODUCTION

Increasingly tight business competition and rapid technological developments encourage companies to continue to increase their competitiveness and achieve their primary goal, namely making a profit (Sari et al., 2018). One of the critical factors that influences a company's success is the smooth running of production, which is closely related to the management of inventory of merchandise or raw materials (Mogere, 2013). Inventory is considered the company's most expensive asset, which reflects the capital invested (Heizer & Render). Controlling raw material inventory is very important for manufacturing or service companies because it can affect the effectiveness and smoothness of production (Mogere, 2013). Uncontrolled inventory can cause high costs both in terms of ordering and storage (Sari et al., 2018).

Therefore, companies need to implement optimal policies in managing inventory to achieve cost efficiency (Sari et al., 2018). PT Gunung Sugih, a company that manages cassava raw materials for tapioca flour, needs help in controlling the supply of cassava raw materials. Even though the company has a daily purchasing target of around ± 200 tons of cassava, there is instability between ordering and usage, causing significant waste. Based on data on purchasing and using cassava, there is a discrepancy between the number of orders and usage, which can hamper the turnover of investment value and cause ineffective costs (Sari et al., 2018). To overcome this problem, companies need to implement efficient methods for managing inventory.

One method that can be used to optimize inventory control is the Economic Order Quantity (EOQ) method (Sari et al., 2020). This method aims to achieve minimum inventory levels by minimizing ordering and storage costs (Yudhanto et al., 2020). The EOQ method has been proven successful in optimizing inventory costs in various companies. Previous research shows that the use of the EOQ method can be effective in reducing inventory costs, resulting in significant cost efficiencies (Sari et al., 2022; Umami et al., 2018). Therefore, this research will focus on the analysis of inventory control of PT Gunung Sugih's tapioca flour raw materials using the EOQ method.

In this context, this research aims to contribute to an understanding of the effectiveness of the EOQ method in managing cassava raw material supplies in tapioca flour processing companies (Umami et al., 2018). This research is expected to provide practical recommendations to companies to increase inventory cost efficiency and achieve company goals. With this background, the author is interested in conducting this research to support the development of a more efficient inventory management strategy at PT Gunung Sugih. This analysis is expected to contribute to the inventory management literature and provide practical guidance for similar companies in the raw material processing industry.

LITERATURE REVIEW

Operation management

Operations management, according to Heizer Render (2015), is a series of activities that produce value through the transformation of input into output, with a focus on the production of goods. Herjanto (2008) describes operations management as a continuous process that is effective in integrating resources to achieve goals. It involves the optimal management of production factors such as labor, machinery, equipment, and raw materials in the process of transformation into goods and services.

Supply

Inventory, according to Rangkuti (2007) and Steven and Choung (2014), involves materials provided, materials in the production process, and finished goods to meet customer demand. This includes stocks or deposits of items, ranging from small, like pencils, to large, like construction machinery. Inventory control, as described by Halimah Pravitasari (2022) and Henry & Lilia (2018), is an activity in operations management to monitor and regulate warehouse capacity so that raw material inventory levels are optimal.

Raw material

Raw materials, according to Sadeli & Siswanto (2010), Sofian Assauri (2016), and Paolo & Franco (2019), are all raw materials that form a large part of the finished product. Selecting suitable raw materials can minimize risks and production costs. Raw materials can be obtained from suppliers, imported, or processed independently.

Economic Order Quantity (EOQ)

The EOQ method, as one of the simple and classic inventory management methods, helps determine when and how many orders should be placed to minimize carrying and ordering costs. Its implementation can reduce inventory costs and resolve inventory problems that may arise.

Safety Stock (SS)

Safety stock, according to Hansen and Mowen (2007) and Assauri (2008), is extra inventory to deal with fluctuations in demand. Lead time management, which is influenced by the availability of goods and the distance between buyers and suppliers, plays a vital role in determining safety stock requirements. The right balance is needed so that there is sufficient inventory, which can hamper company operations and cause additional costs.

METHODOLOGY

Research Objects and Observation Time

The object of this research is PT Gunung Sugih, which is located on Jl. Pandawa, Sidokerto, District. Bumi Ratu Nuban, Kab. Central Lampung, Lampung. The research was conducted from 01 June to 30 June 2023, with an observation duration of 1 month.

Research methods

This research uses a survey method with a descriptive approach. The survey method is a quantitative approach to collecting data related to beliefs, opinions, characteristics, behavior and variable relationships. This research is a type of quantitative research that focuses on calculating numbers and uses a descriptive approach to describe existing facts.

Data source

Data sources consist of primary and secondary data. Primary data was obtained through direct interviews with the operational manager of PT Gunung Sugih. Secondary data was taken from literature, records and company inventory documents.

Data collection technique

Data collection techniques involve direct observation at the PT Gunung Sugih location, interviews with related parties, and collection of documents related to relevant supplies and costs.

Analysis Method

Data analysis uses a quantitative descriptive approach. This method is used to describe, explain, or summarize conditions, situations, phenomena, or research variables by utilizing data revealed through observation, interviews, and documentary materials. To measure inventory levels, this research uses the Economic Order Quantity (EOQ) method.

RESULT

Company Profile

PT Gunung Sugih, a private company engaged in processing cassava into tapioca flour, occupies an essential position in the agro-industry industry. Located on Jl. Pandawa, Sidokerto, District. Bumi Ratu Nuban, Kab. Central Lampung, Lampung, this company has gone through a long history since it was founded in 1957 by Mr Herman Taufik. Since then, the company's leadership has changed hands until today, with Mr. Sofyan as leader since 2006. With business location permit No. 718/TTU/ID/1995, PT Gunung Sugih operates a production facility covering an area of 7 hectares, capable of producing 200 tons of tapioca flour per day. The company's core activities are divided into production and marketing. Tapioca flour production, which is the backbone of PT Gunung Sugih's operations, is carried out every day using 13 quality machines from Germany and China. Inventory control is a crucial aspect in maintaining a smooth production process, including the receipt of cassava and carefully scheduled production activities.

On the marketing side, PT Gunung Sugih optimizes the distribution of its products through a distribution center in Tangerang, with the main distribution focus in West Java, Jakarta, Palembang and Lampung. Product deliveries are carried out by two to three fuso cars every day, ensuring the availability of quality tapioca flour on the market. With various brands such as Delman Hijau, YN Hijau, Delman Merah, YN Merah, and Waluh, PT Gunung

Sugih shows commitment to product quality. A regular testing process for water content and whiteness ensures that each brand can be clearly separated based on strict quality standards. As a company with a history and significant contribution to this industry, PT Gunung Sugih continues to be committed to maintaining quality standards and operational sustainability.

Company Inventory Policy

PT Gunung Sugih, based on research that has been carried out, the company in controlling raw material inventory basically has yet to use any methods or is still conventional. The company's inventory policy is based on established policies and based on historical data by the company. Companies only place orders for their inventory based on historical data from the previous month or existing purchasing data in the previous month and calculate the amount of inventory available in the warehouse before placing an order the next day so that obstacles are encountered, such as instability in controlling inventory levels such as excess and shortage of inventory. Conventional policy is a simple policy when compared to other methods. The policy implemented by the company in the process turns out to incur more costs for ordering and storage costs, which results in wasted costs and will reduce the company's profits, so the company needs a unique method for optimal inventory.

Data on Purchase and Use of Cassava Raw Materials

Based on the results of interviews with the Deputy Production Manager, PT Gunung Sugih, in 2022, will order cassava raw materials 15 times a month with an average quantity of 550 tons per order. The order frequency was determined by the company in line with the factory capacity of 180 times during the year, with total orders reaching 98,430 tons and a monthly average of around 8,370 tons. Cassava orders are made every day to meet the factory capacity of 200 tons through a checking and weighing process. The company emphasizes the importance of efficiency in ordering, avoiding more significant costs due to unplanned orders. Total cassava use throughout 2022 will reach 74,047 tonnes, with company policies and capacity having been adjusted. Although there are fluctuations in the amount of use, there has been no significant increase or decrease in the use of cassava.

Ordering costs (Ordering Cost)

Based on interviews at PT Gunung Sugih, the cost of ordering cassava raw materials includes telephone costs, unloading costs and administration costs. The monthly telephone fee is Rp. 125,000, unloading costs are calculated based on company policy at a rate of Rp. 20 per kg of cassava, and administration costs include purchasing stationery and the like. The total ordering costs during 2022 will reach IDR. 78,000,000. Determining ordering costs reflects the company's efforts in managing expenses related to orders for raw materials.

Storage Costs (Holding Costs)

Based on an interview with PT Gunung Sugih, the cost of storing cassava raw materials consists of warehouse electricity costs and warehouse employee costs. There are no opportunity costs from the warehouse because it is not rented out, and depreciation costs for the warehouse and cassava are not incurred because the company has a set damage standard. Storage costs only occur in storing the remaining raw materials for daily production, with warehouse electricity costs amounting to Rp. 6,300,000 and warehouse employee costs of Rp. 34,800,000 per year. In the context of a scientific article, these findings provide a detailed description of the cost components for storing cassava raw materials at PT Gunung Sugih, including specific elements such as electricity and labor. Based on calculations that have been carried out, the storage cost per ton of PT Gunung Sugih's cassava raw materials in 2022 is IDR. 555.105. These results are obtained by dividing the total storage costs by the total raw material requirements for a year.

Data analysis

Determination of Company TIC

Determining the company's TIC is used to find out whether the calculation of orders for supplies of wheat flour raw materials according to the EOQ method is optimal compared to using the company's inventory policy. After knowing how much it costs to order one order and the cost of storing tapioca flour raw materials per ton, the next step is to calculate the total inventory issued by PT Gunung Sugih in 2022. The calculation of the total inventory cost according to the company policy implemented by the company in 2022 is as follows:

$$\text{TIC} = (\text{order frequency} \times S) + (\text{average inventory} \times H)$$

$$\text{TIC} = (180 \times 433.500) + (6.170 \times 555.105)$$

$$\text{TIC} = 78.000.000 + 3.424.997$$

$$\text{TIC} = \text{Rp. } 81.424.997$$

From the calculation above, it can be seen that the total inventory costs, according to the inventory policy implemented by PT Gunung Sugih in 2022 to procure cassava or cassava raw materials, is IDR. 81,424,997.

Safety Inventory (Safety Stock)

Safety stock is inventory held in excess of demand estimated by the company due to variable demand or waiting times (Stevenson & Chuong, 2014). The results of research and interviews conducted with the resource person, Mr. Williem, as production manager, it is known that the company does not provide safety supplies in its production activities. According to Mr. Williem, the company does not need safety stock in its production because the raw materials needed are in accordance with the factory's capacity per day.

Reorder Point (Reorder Point)

The reorder point is a certain level in inventory where the order must be placed immediately (Rangkuti, 2009). As a result of research and interviews conducted with production managers, PT Gunung Sugih constantly reorders

cassava raw materials every day, even though there are leftover raw materials from the previous day's production in the storage warehouse.

Analysis of Raw Material Inventory Using the Economic Order Quantity (EOQ) Method

The calculation of raw material inventory control using the EOQ method aims to determine the optimal level of raw material purchases by PT Gunung Sugih, which can minimize inventory costs. PT Gunung Sugih requires some data regarding the company's raw material inventory for production in 2022. The data needed is the amount of cassava raw materials needed for one year (D), ordering costs each time an order is made (S) and storage costs of cassava per unit (H). Data shows that in 2022, the amount of cassava or cassava raw materials used by PT Gunung Sugih will be 74,040 tons. The ordering fee incurred by the company for each order is Rp. 433,500, and storage costs per ton of Rp. 555.105. After knowing all the data needed, the next step is to calculate the optimal economic order quantity for PT Gunung Sugih.

$$EOQ = \sqrt{\frac{2DS}{H}}$$

$$EOQ = \sqrt{\frac{2 \times 74.040 \times 433.500}{555.105}}$$

$$EOQ = \sqrt{116.491.570}$$

$$EOQ = 10.793$$

Order frequency calculation:

$$\text{Order frequency calculation} = \frac{\text{Cassava consumption per year}}{EOQ}$$

$$\text{Order frequency calculation} = \frac{74.040}{10.767}$$

$$\text{Order frequency calculation} = 6,870 \text{ times}$$

From the calculations above, it can be seen that the number of orders for cassava or cassava according to the EOQ method for each order is 10,793 tons with an order frequency of 7 times. The calculation results of the order quantity using the EOQ method above are tremendous and exceed the storage capacity of the PT Gunung Sugih factory warehouse. Therefore, the company needs to add one more warehouse to store cassava raw materials if it applies the EOQ method.

Safety Inventory (Safety Stock)

Safety stock is an inventory unit that is always available within the company to anticipate demand fluctuations and avoid stock outs. Determining the amount of safety stock can be done by comparing the use of raw materials and then calculating the standard deviation. Even though the optimal or economic order quantity has been found, the demand quantity is uncertain and changes. Because the company's desired service level of 95% means a possible inventory of 5%, with a tolerance limit of 5% (0.05) and a service level of 95%

(0.95), the Z value (standard deviation) is 1.65. This standard deviation value means the size of the safety stock in 2022 is:

$$\begin{aligned}SS &= Sd \times Z \\SS &= 170,471 \times 1,65 \\SS &= 281,27715 \text{ ton}\end{aligned}$$

From these calculations it can be seen that in 2022, PT Gunung Sugih must provide a safety stock of 281 tons to avoid running out of raw materials (stock out). The amount of safety stock is said to be large enough to be stored at the same time. Therefore, PT Gunung Sugih needs to have additional space to store safety stock.

Reorder Point (Reorder Point)

The reorder point is a specific time at which the company must order supplies of cassava raw materials before the inventory in the warehouse runs out. In calculating reorder points, companies must consider lead time. At PT Gunung Sugih, the lead time when ordering cassava is two days. Meanwhile, the average amount of cassava usage carried out by the company is 200 tons per day. The reorder point calculation, according to EOQ at PT Gunung Sugih, is as follows:

$$\begin{aligned}ROP &= \text{safety stock} + (\text{lead time} \times \text{average usage}) \\ROP &= 281,27715 + (2 \times 200) \\ROP &= 681,27715 \text{ ton (dibulatkan menjadi 681 ton)}\end{aligned}$$

The results obtained in the data above show that the total inventory of cassava raw materials in the warehouse is only 681 tons. Therefore, PT Gunung Sugih must immediately reorder cassava supplies so that production activities are maintained.

Total Inventory Cost (Total Inventory Cost)

Companies need to know whether the calculation of cassava raw material inventory orders according to the EOQ method is more optimal than the company's inventory policy. Therefore, a comparison of total inventory costs is carried out first based on the company's calculations using the EOQ method. This comparison will help companies determine inventory control policies. This will make the company determine the policy it is currently using or start improving its policy and switch to the EOQ method. The formula for calculating total inventory costs according to EOQ is as follows:

$$\begin{aligned}TIC &= \left(\frac{D}{Q}\right) S + \left(\frac{Q}{2}\right) H \\&= \left(\frac{74.040.000}{10.793,126}\right) \times 8.045.500 + \left(\frac{10.793,126}{2}\right) 555.105 \\&= 55.188.070 + 2.995.659 \\&= 58.183.729\end{aligned}$$

Calculating the total inventory cost using the EOQ method above, it can be seen that the total inventory cost that needs to be incurred by PT Gunung Sugih in 2022 is IDR. 58,183,729.

Comparative Analysis of Cassava Raw Material Inventory Control According to Company Policy using the EOQ Method

Inventory control of cassava raw materials according to the company inventory policy implemented by PT Gunung Sugih can actually be compared with the EOQ method. This comparison aims to find out which comparison results are more optimal and able to produce the minimum costs.

The results of the calculations that have been carried out can be seen in the comparison of raw material inventories between company policies and policies using the EOQ method, which can be seen from optimal purchasing, purchasing frequency and total raw material inventory costs.

The comparison of inventory control according to company policy and the EOQ method can be seen in Table below:

Table 1. Comparison of Inventory Control According to Company Policy with the EOQ Method

No.	Note	Company Policy	EOQ Method
1	Order quantity per order (Tons)	13.333	10.793
2	Order Frequency (Times)	15	7
3	Safety stock (Tons)	-	281
4	Reorder Points (Tons)	-	681
5	Total Inventory Costs (Rp.)	81.424.997	58.183.729

Source: Data processed by researchers (2023)

Table 1. above shows that the quantity ordered for cassava or cassava raw materials according to the EOQ method is greater than according to company policy. According to the EOQ method, PT Gunung Sugih 2022 needs to place orders seven times in one month for a quantity per order of 10,793 tons. Meanwhile, the company's policy is to order raw materials 15 times a month, with an order quantity of 13,333 tons. Meanwhile, for the total inventory costs, according to EOQ calculations, the costs incurred are Rp. 58,183,729, this cost is smaller than the total inventory cost according to company policy of Rp. 81,424,997.

PT Gunung Sugih has yet to determine how much safety stock (SS) must be available in the storage warehouse. In contrast, according to the EOQ method, the safety stock that must be in the warehouse is 281 tons. PT Gunung Sugih has yet to determine the Reorder Point (ROP). In contrast, according to the EOQ method, it is carried out when the raw material inventory in the warehouse is at 681 tons.

Warehouse Addition

The EOQ method can be applied at PT Gunung Sugih if one room with a larger size is added to the number of storage buildings or the warehouse area currently used is added. Based on the observations made, it would be better for PT Gunung Sugih to add a warehouse because cassava storage in the old warehouse is deemed not to be suitable for capacity. The company has much land that has not yet been cultivated, such as adding a building for a warehouse in an area near the use of liquid waste or could be located near a drying area for solid waste. This addition to the warehouse will be helpful for the company in utilizing space and storing cassava raw materials. The company can further increase its production by not throwing away leftover cassava raw materials from production and increasing the amount of cassava raw materials used without having to think about where to place the missing raw materials. It is assumed that the addition of a new warehouse can increase the company's profits from its tapioca flour products. The costs that arise if PT Gunung Sugih adds a warehouse are as follows:

Table 2. Storage Costs per Year in New Warehouse

Fees type	Storage cost
Electricity	Rp. 3.360.000
Warehouse Maintenance	Rp. 725.000
Total	Rp. 4.085.000

Source: Data processed by researchers (2023)

In the table above, it can be seen that the costs incurred by PT Gunung Sugih for storing cassava raw materials in the new warehouse for a year are Rp.4,085,000, which consists of electricity costs and building maintenance costs. Employee costs are not included in the new warehouse to minimize costs incurred by the company. The old warehouse employees consist of 3 employees who can be assigned to the new warehouse, so there is no need for additional employees. Warehouse employees only need to ensure and maintain that raw materials are in good condition so they can be used for production. Electricity costs are assumed to be Rp. 3,360,000/year, which researchers obtained from survey results and data provided by companies in old warehouses, which are in the range of Rp. Researchers assume 280,000/month and maintenance costs to be Rp. 725,000/year because maintenance is deemed necessary so that the warehouse is maintained and can be used continuously.

DISCUSSION

The results of the research report, which was carried out for 30 days at PT Gunung Sugih for the period 01 June 2023 to 31 June 2023, it can be seen that controlling the supply of cassava raw materials at PT Gunung Sugih is yet to be optimal. This is because the company places orders only based on estimates and decisions and has not used any inventory control methods or policies. One method that can be used to manage inventory is the Economic Order Quantity (EOQ) method. The EOQ method can later help companies control raw material inventory to minimize total inventory costs. Raw material inventory control can

be used to help companies control overall inventory. In this research, the results compare which method is appropriate between company policy and the EOQ method that the company can implement. In accordance with the results of the calculations that have been carried out, the comparison is seen from the optimal purchase quantity, purchase frequency, safety stock, when the company must reorder and the total cost of raw material inventory.

The results of calculating the total inventory costs at PT Gunung Sugih have a cost of Rp. 81,424,997, with a total order quantity of 13,333 tons with an order frequency of 15 times, as seen in the comparison in Table 4.8. The calculation results of all methods in Table 4.8 can be seen that the order quantity per order according to the EOQ method is smaller than the company policy. According to the EOQ method, the optimal order quantity for one order that should be placed in 2022 is 10,793 tons. Even though the number of orders is large, the company has a lower order frequency. This can make the total cost of inventory smaller than the company policy, which is IDR. 58,183,729. Apart from that, the company has not provided safety stock in its production activities.

Meanwhile, according to the EOQ method, the safety stock that must be in the warehouse is 281 tons. The company also still needs to set a reorder point. In contrast, if the company implements a policy according to the EOQ method, the company must reorder when the raw material inventory in the warehouse is only 681 tons.

The results of the analysis of the Economic Order Quantity (EOQ) method can be concluded that the use of the EOQ method in controlling raw material supplies is more effective and efficient when compared to the policy currently used by PT Gunung Sugih. The results of the analysis are also supported by previous research conducted by Sari et al. (2022) with the title "Minimizing Inventory Cost of Dried Food Materials Availability: An Analysis in Teaching Hospital" and Dewi Rosa and Elsayus Yulia (2017) with the title "Control Analysis Raw Material Supplies at PT Tri Agro Palma Tamiang." Therefore, applying the EOQ method can save raw material inventory costs so that it can minimize total inventory costs. Apart from that, the EOQ method will save more on costs related to inventory so that PT Gunung Sugih will continue to produce without fear of shortages or running out of raw materials so that it can meet consumer demand at any time and avoid the risk of losses.

CONCLUSION AND RECOMENDATION

Based on the results of 30 days of research, the conclusion that can be drawn is that the cassava raw material inventory control policy implemented by PT Gunung Sugih has not been effective, as can be seen from the high total inventory costs and has a negative impact on the company's profits. Therefore, companies should seriously consider using the Economic Order Quantity (EOQ) method in managing inventory because this method can not only minimize total inventory costs but also provide potential savings of IDR. 23,241,268. However, it should be noted that the application of the EOQ method also has limitations. One limitation is the assumption that demand for cassava raw materials is constant and unchanging, which may only sometimes reflect dynamic market conditions.

Therefore, companies also need to closely monitor fluctuations in market demand so they can adjust their inventory strategy more responsively. In addition, it should be noted that the application of the EOQ method depends on the accuracy of historical data, so companies need to ensure accurate and up-to-date inventory data to obtain optimal results. Apart from that, increasing the capacity of cassava storage warehouses also needs to be considered more deeply, considering the potential for increased sales, which could have an impact on production volumes. However, increasing warehouse capacity also has implications for storage, logistics and other infrastructure costs. Therefore, further analysis is needed to assess the balance between benefits and costs associated with increasing warehouse capacity.

FURTHER STUDY

This research still has limitations, so further research needs to be done related to the topic "Inventory Control Analysis of Tapioca Flour". Future research can use different Tapioca Flour objects to add insight for readers.

REFERENCE

- Assauri, Sofyan. (2016). *Manajemen Produksi dan Operasi*, Edisi Revisi. Jakarta : Lembaga Penerbit FE UI
- Chuong, W. J. (2015). *Manajemen Operasi*. Jakarta: Salemba Empat.
- Heizer, J. d. (2015). *Operations Management (Managemen Operasi)*. ed 11, Penerjemah : Dwi anoegrah wati S dan Indra Almahdy.
- Heizer, Jay. (2015). *Manajemen Operasi*. Jakarta : Salemba Empat.
- Herjanto. (2008). *Manajemen Operasi*. (D. A. Almahdy, Trans.) Jakarta: Salemba Empat.
- Rangkuti, F. (2004). *Manajemen Persediaan Aplikasi di Bidang Bisnis*. Jakarta: PT Raja Grafindo Persada.
- Sadeli, dan Siswanto, 2010. *Akuntansi Manajemen: Sistem, Proses, dan Pemecahan Soal*. Edisi 1. Cetakan keempat. Jakarta: PT Bumi Aksara
- Sari, R. M., Firiza, S. Y., Erwin, Syahputri, K., Rizkya, I., & Siregar, I. (2021). Minimizing Inventory Cost Of Dried Food Materials Availability: An Analyzing In Teaching Hospital. *IOP Conference Series: Materials Science and Engineering*, 1122(1), 012116.