Asian Journal of Applied Business and Management (AJABM)
Vol.3, No.3, 2024: 187-198

Analysis of the Production Area Planning of Ground Fish at CV Hadori in East Lampung District

Amalya Almira Azzahra[1]*, Rr. Erlina[2], Dwi Asri Siti Ambarwati[3]
Management Department, University of Lampung
Corresponding Author: Amalya Almira Azzahra amalyaalmiraazz@gmail.com

A R T I C L E I N F O

Keywords: Break Even Point, Production Planning, Sales Forecast, Production Scale

Received : 27, June
Revised : 11, July
Accepted: 01, August

A B S T R A C T

This study investigates production scale planning at CV Hadori, a fish processing company, using Break-Even Point (BEP) analysis and linear trend forecasting. The company faces significant overproduction of minced fish, leading to excess inventory and reduced profits. The research employs a descriptive quantitative approach, analyzing historical production and sales data through trend analysis and BEP calculations. Findings indicate that CV Hadori must produce and sell over 405,436 kg of processed fish in 2026 to achieve profitability. Recommendations include optimizing production and sales strategies, investing in appropriate machinery, and continuously monitoring market conditions to adjust forecasts. Effective production planning will help minimize surplus, enhance profitability, and ensure long-term sustainability.

INTRODUCTION

The success of a company is influenced by the interaction of various activities, such as production, marketing, expenditure, and human resources (Salu & Nyoko, 2018). Production scale, a component of these activities, determines the quantity and type of products a company needs to produce within a specific timeframe. This involves not only the production volume but also the type of products, aiming to create a product mix that maximizes profits by considering available factors (Haobenu et al., 2021). Production scale refers to the amount or volume of output that a company should produce within a given period (Reksohadiprodjo & Gitosudarmo, 2000).

To generate a product, business operators must plan the production scale. Production planning is a crucial management function for future production activities. Before starting production, planning is essential to avoid undesirable outcomes. It involves decision-making about what and how much product will be produced within a certain period and the required raw materials for the production process. Creating a production plan means determining the quantity of products to be produced within a specific future timeframe, involving production factors to achieve maximum profit and ensure the company's sustainability effectively and efficiently. Decision-making, a crucial aspect of planning, involves developing and selecting methods or actions to solve specific problems. Managers must analyze organizational resources and decide how to allocate them to achieve company goals effectively and efficiently (Manullang, 2005).

Production can be defined as activities that create value from goods by utilizing available production factors, thereby increasing the utility of goods or services to meet human needs. Production factors such as raw materials, product demand, and production capacity must be well-managed, planned, and directed toward achieving goals. Planning, as a fundamental management function, is integral to achieving the company's objectives and must be carefully crafted to avoid potential losses. Business planning is an integrative activity aimed at maximizing the overall effectiveness of the enterprise as a system, in line with the company's pre-established goals.

CV Hadori, located in Jalan Margasari, Desa Margasari, is a company engaged in the fish processing industry, specifically producing minced fish. The company has built a good reputation and has a stable market share. However, recently, the business owner, Mr. Hadori, reported that the company faces issues in planning the production scale of minced fish. The company has experienced overproduction of minced fish, leading to an accumulation of unsold inventory. This identifies the research problem related to the excess inventory of minced fish at CV Hadori, occurring during the period before the study (2019-2023), thereby reducing the company's profit estimates. Trends indicate a yearly increase in surplus inventory, averaging 5,360 kg/year, with the highest surplus in 2023 at 7,600 kg. Excess inventory may result from inaccurate production planning. Therefore, precise calculations are necessary to develop a more accurate production scale plan to minimize excess inventory and ultimately increase the company's profit.

Improper production scale planning can lead to potential issues in production planning, affecting the company's operational smoothness and customer satisfaction. This can cause inefficiencies in resource utilization, increased production costs, and missed sales opportunities. Moreover, excess inventory can strain the company's storage capacity. This issue arises from the lack of accurate and comprehensive production planning by the production department, resulting in suboptimal resource and capacity utilization.

Assauri (2008) explained that, based on production management theory, activities that organize and coordinate the use of various resources, including human resources, equipment, funds, and materials, effectively and efficiently to create and enhance the utility of goods or services are essential in company operations. In this context, analyzing minced fish production scale planning at CV Hadori is part of production management. One technique for analyzing production scale planning is the break-even point (BEP). BEP is the point where generated revenue equals incurred costs, resulting in no profit or loss. This analysis is used to determine the necessary production quantity of minced fish for the company to reach the break-even point. Utilizing the BEP method, the study can analyze the relationship between the production scale of minced fish at CV Hadori, production costs, revenue, and the break-even point (Ananda & Hamidi, 2019).

Despite extensive studies on production scale planning, research gaps persist. Nyok and Foenay (2022) found that BEP analysis increased production scale at Perusahaan Tahu Putra Jaya. Lie et al. (2021) noted that production scales reached break-even points, while Akbar et al. (2022) found scales below sales realization. Therefore, analyzing minced fish production at CV Hadori is crucial. Comprehensive market demand and sales trend analysis can optimize production planning, ensuring timely demand fulfillment and enhancing operational efficiency. This research examines whether BEP analysis with linear trend forecasting can optimize production planning for CV Hadori, aiming for efficient forecasting and practical decision-making to reduce surplus and enhance sustainability.

LITERATURE REVIEW

Operation Management

Operations management involves methods organizations use to produce goods and services (Slack & Jones, 2021) and the management of processes creating or delivering these goods and services (Stevenson, 2021). It includes developing, implementing, and maintaining effective processes, optimizing resources, and minimizing waste for organizational efficiency (Anderson & Parker, 2022).

Production Planning

Production planning is designed to set the direction for future actions, specifying what needs to be done, in what quantity, and when (Eunike et al., 2021). It involves preparing for the necessary raw materials, labor, capital, and equipment for producing goods and services during a specific period (Assauri,

2008). There are short-term plans, focusing on up to a year to manage labor, materials, and facilities, and long-term plans extending beyond a year to address capacity expansion and equipment development (Assauri, 2008). Planning stages include forecasting goals, locations, timing, and cost-benefit analysis, and programming tasks and schedules (Kommarudin, 2006). The ultimate goal is to achieve profitability and ensure the company's survival by effectively and efficiently utilizing production factors (Assauri, 2008).

Sales Forecast

Forecasting is a technique that utilizes historical data to predict future trends, relying on time series data collected over specific intervals (Riyanto & Rahman, 2022). It systematically estimates future events based on past and current information, aiming to minimize errors between actual outcomes and forecasts. The benefits of forecasting include aiding effective and efficient planning, determining future resource needs, and guiding managerial decisions (Supuwiningsih et al., 2022). By analyzing historical data, forecasting helps organizations anticipate future demands and make informed decisions, enhancing operational efficiency and strategic planning.

Production Scale

Production scale refers to the volume or quantity of goods a company should produce within a given period (Reksohadiprodjo & Gitosudarmo, 2000; Sukanto, 2007). Effective planning is crucial to ensure that production capacity is aligned with maximizing profits, as inadequate planning can lead to overproduction or underproduction. Ahyari (2007) emphasizes that production planning involves determining the required production capacity. Key factors influencing production expansion include the availability of raw materials, which are essential for continuous production, accurate sales forecasts to prevent unsold inventory, and production capacity, which dictates the amount of output a machine can produce (Poerwanto, 2004).

Break Even Point Method

The break-even point (BEP) is the production level at which total revenue equals total costs, indicating no profit or loss (Riyanto, 2008). It involves analyzing fixed and variable costs to determine the sales volume needed to cover all expenses. BEP analysis helps managers understand the relationship between costs, sales volume, and profitability (Munawir, 2006). The BEP formula calculates the number of units required to achieve this equilibrium (Harjanto, 2001).

METHODOLOGY

Types of Research

This study employs a descriptive method with a quantitative approach. According to Sugiyono (2018), descriptive research aims to assess the values of independent variables without comparing them to others. Quantitative research relies on numerical data to provide measurable insights (Sugiyono, 2018).

Data Source

The study utilizes both primary and secondary data sources. Primary data were collected through direct interviews with CV Hadori's owner and relevant production staff, focusing on raw material usage and labor costs. Secondary data were obtained from company records, including data on minced fish production and sales (Sugiyono, 2018). Data collection methods included literature review for company sources, interviews with key personnel, direct observations of production activities, and documentation analysis of company reports (Sugiyono, 2018).

Data Analysis Technique

The data analysis in this study employs two main methods. First, the trend analysis technique, which estimates future trends based on historical data, is utilized. This method involves examining extensive data over a relatively long period to identify fluctuations and influencing factors. Linear models are used for forecasting, facilitated by Microsoft Excel, allowing predictions of variable costs, fixed costs, sales volume, and product prices (Gitosudarmo, 2002). Trend analysis helps project future values and predict conditions for specific time periods.

Second, the Break Even Point (BEP) analysis is used to determine when a business will cover its costs without profit or loss. BEP calculates the number of units or revenue needed to cover fixed and variable costs, aiding in decision-making and profitability assessment. According to Harjanto (2001), BEP is calculated using the formula: BEP (X) = Fixed Costs / (Selling Price per Unit - Variable Cost per Unit). This method helps businesses understand the sales volume required to achieve financial equilibrium.

RESULT

General Description of Research Object

CV Hadori, founded in 2018 in Margasari Village, East Lampung Regency, operates within the fisheries sector. The company’s establishment required an initial capital investment of Rp. 100,000,000, sourced from personal funds. This investment covered expenses for production equipment, leasing business premises, purchasing raw materials, and other operational costs. The initial capital was vital for setting up the company’s infrastructure and initiating its business operations effectively.

CV Hadori aims to be a continuously evolving company that addresses the market demand for processed fish. Its mission focuses on generating employment opportunities and meeting the need for processed fish products. The company produces one ton of processed fish daily, but prices vary depending on the type of fish, leading to an average price of Rp. 19,667 per kilogram. The production volume has seen an increase from 2020 to 2023, attributed to the easing of COVID-19’s adverse effects. However, CV Hadori does not currently utilize forecasting and planning methodologies, relying solely on available catch. To optimize future production and manage resources

effectively, it is crucial for CV Hadori to adopt scientific forecasting techniques and strategic planning based on historical data.

Production Description of Research Object

CV Hadori uses both main raw materials and auxiliary materials in their production process, carefully considering the usage of each to ensure accuracy and efficiency. The company can produce one ton of ground fish daily. The sale prices for ground fish vary, so the company uses an average price of all types to establish a standard selling price. For example, the average price of ground fish at CV Hadori is Rp.19,667 per kilogram, with specific types like Ikan Krisi priced at Rp.25,000, Ikan Jolot at Rp.17,000, and Ikan Baji at Rp.17,000.

From 2020 to 2023, CV Hadori experienced an increase in production volume due to the easing of COVID-19 impacts. The business converts raw fish into ground fish, a process that involves some material loss. Despite not using forecasting or planning systems, CV Hadori has managed production based on the fish catch from fishermen. For better future planning, scientific methods that consider past production data are needed. From 2019 to 2023, the company processed a total of 3,916,800 kilograms of raw materials into 1,958,000 kilograms of ground fish, reflecting a steady growth in their production capacity.

Sales Volume Forecasting Analysis

Forecasting sales volume is essential for CV Hadori to predict future market demand, ensuring a balance between production and sales, and minimizing waste and losses. Given that CV Hadori was established in 2018, the forecasting data spans from 2024 to 2026. Using the sales data from 2019 to 2023, it shows an increasing trend in sales. For forecasting, the Linear Trend Method is applied, where the forecasted sales (Y') is determined using the formula Y'=a+bx. Here, a represents the constant component of sales, b is the annual growth rate, and x is the specific period.

Table 1. Calculation of Production Scale Forecasting for 2019-2023

Year (n)	Sales (Y)	Period (x)	XY	x^2
2019	308.000	-2	-616.000	4
2020	311.000	-1	-311.000	1
2021	430.900	0	0	0
2022	434.000	1	434.000	1
2023	447.400	2	894.800	4
Total	**1.931.300**		**401.800**	**10**

The calculated values for a and b are derived from the sales data from 2019 to 2023, resulting in a = 386,260 and b = 40,180. Using these values, the forecasted sales for CV Hadori are computed for the years 2024, 2025, and 2026.

Year	Production Scale
2019	308.000
2020	311.000
2021	430.900
2022	434.000
2023	447.400
2024	**506.800**
2025	**546.980**
2026	**587.160**

The expected sales for 2024 are 506,800 kg, reflecting a 13.7% increase from 2023. For 2025, the forecast is 546,980 kg, a 7.92% rise from 2024. In 2026, the predicted sales volume is 587,160 kg, marking a 7.34% increase from the previous year. This forecasting helps CV Hadori in planning its production activities effectively for the upcoming years.

Raw Material Forecast Analysis

Due to CV Hadori's business model of sourcing fish from the sea and removing the residue and bones before processing, a forecasting analysis for raw materials is essential. This helps in accurate calculations and planning. Using the Linear Trend Analysis method, the historical data from 2019 to 2023 is used to forecast future raw material needs. The data indicates that the raw material usage has been increasing, which is evident from the provided table.

Table 2. Forecasting Calculations for Raw Materials for 2019-2023

Year	Raw Material (Y)	Period (x)	XY	X^2
2019	622.000	-2	-1.244.000	4
2020	634.000	-1	-634.000	1
2021	870.800	0	0	0
2022	880.000	1	880.000	1
2023	910.000	2	1.820.000	4
Total	**3.916.800**	**0**	**822.000**	**10**

The calculations for the forecast variables a and b are: a = 783,360 and b = 82,200. Using these values, the forecast equation Y' = 783,360 + 82,200x is derived. For the years 2024, 2025, and 2026, the raw material forecasts are calculated. In 2024, with x = 3, the expected raw material usage is 1,029,960 kg. For 2025, with x = 4, the forecast is 1,112,160 kg, and for 2026, with x = 5, it is 1,194,360 kg. These forecasts assist CV Hadori in planning its raw material procurement and processing capacity effectively for the next three years.

Break Event Points

The analysis method used in this study is designed to identify the break-even point by calculating fixed costs, variable costs, and the returns from the produced goods. For CV Hadori, the productivity of direct is calculated using the production volume of 2023 divided by the number of direct laborers in 2023. With 447,400 kg produced and 50 laborers, the productivity is 8,948 kg per laborer. To determine the required workforce for 2024 to 2026, the projected

production volume is divided by labor productivity. For 2024, with a production forecast of 506,800 kg, CV Hadori will need 57 workers. In 2025, with a forecast of 546,980 kg, 61 workers are needed, and in 2026, with a forecast of 587,160 kg, 66 workers are required.

In calculating the break-even point (BEP), it is essential to consider the price per unit, variable costs, and fixed costs. For CV Hadori, the variable cost is set at Rp800 per kg for fish cleaning. This cost is multiplied by the production volume to determine the total variable costs.

Fixed costs include overhead, depreciation, administration, and taxes. Depreciation is calculated by dividing the initial cost of the asset by its economic life. For example, the grinding machine has an initial cost of Rp100,000,000 and a lifespan of five years, resulting in an annual depreciation cost of Rp20,000,000.

Table 3. Overhead Costs

Information		**Value**
Factory Overhead Costs		
	Annual Depreciation Fee	20.000.000
	Diesel (2 Engines)	49.640.000
	Transportation (5 Cars)	730.000.000
Total		**799.640.000**

Annual overhead costs, including fuel for two machines and transportation for five vehicles, total Rp799,640,000.

Table 4. Fixed Cost

Information		**Value**
Factory Overhead Costs		
	Annual Depreciation Fee	20.000.000
	Diesel (2 Engines)	49.640.000
	Transportation (5 Cars)	730.000.000
	Administration and general fee	
	Tax	700.000
	Other cost	
	Initial capital	100.000.000
	Total	**900.340.000**

Using these calculations, the total fixed costs amount to Rp900,340,000. The variable costs per unit for the years 2024, 2025, and 2026 are computed based on the production volumes and associated costs.

For 2024, the total variable cost per unit is Rp12,994; for 2025, it is Rp13,000; and for 2026, it is Rp13,005. The BEP is determined using the formula:

$$\boldsymbol{BEP = \frac{F}{P - V}}$$

Where F is the fixed cost, P is the price per unit, and V is the variable cost per unit.

Year	Raw Material (Kg)	Raw Material Cost (Rp)	Product Amount (Kg)	Workforce Cost (Rp)	Variable Cost Total (Kg)	Variable Cost (Rp)
	(a)	(b)	(c)	(d)	(b+d) = (e)	(e/c) = (f)
2024	1.029.960	6.179.760.000	506.800	405.440.000	6.585.200.000	12.994
2025	1.112.160	6.672.960.000	546.980	437.584.000	7.110.544.000	13.000
2026	1.194.360	7.166.160.000	587.160	309.728.000	7.635.888.000	13.005

In 2024, the break-even point (BEP) for CV Hadori is calculated by taking the total fixed costs, which are 2,701,020,000 rupiahs, and dividing by the difference between the price per unit (19,667 rupiahs) and the variable cost per unit (12,994 rupiahs). This results in a break-even point of 404,768 kilograms. Therefore, CV Hadori must produce and sell more than 404,768 kilograms of fish to achieve a profit. Producing and selling less than this amount will result in a loss.

In 2025, the BEP is determined similarly. The total fixed costs remain the same at 2,701,020,000 rupiahs. This amount is divided by the difference between the price per unit (19,667 rupiahs) and the variable cost per unit (13,000 rupiahs), resulting in a break-even point of 405,132 kilograms. CV Hadori needs to produce and sell more than 405,132 kilograms of fish to avoid losses.

In 2026, the BEP is again calculated with the same total fixed costs of 2,701,020,000 rupiahs. This is divided by the difference between the price per unit (19,667 rupiahs) and the variable cost per unit (13,005 rupiahs), leading to a break-even point of 405,436 kilograms. To ensure profitability, CV Hadori must produce and sell more than 405,436 kilograms of fish.

Therefore, to remain profitable, CV Hadori needs to exceed these production volumes for each respective year: 404,768 kilograms in 2024, 405,132 kilograms in 2025, and 405,436 kilograms in 2026. Failure to meet these production levels will result in financial losses for the company.

DISCUSSION

The Break Even Point (BEP) analysis for CV Hadori reveals that in 2026, the company must produce and sell more than 405,436 kg of processed fish to achieve a profitable outcome. If CV Hadori produces less than this amount, the company will face financial losses. The BEP calculations for the years 2024 through 2026 assume that the company will expand its operations according to forecasts and that the selling price of processed fish will remain constant. However, these calculations do not factor in potential fluctuations in fish prices or variations in external conditions, such as changes in sea conditions that could impact raw material availability. To expedite reaching the BEP, CV Hadori should focus on maximizing both production and sales to avoid any waste or unsold inventory. Ensuring efficient use of resources and minimizing losses are critical to achieving financial stability.

As the forecasts indicate a substantial 33% increase in production and raw materials by 2026 compared to 2023, CV Hadori must carefully evaluate its investment in grinding machines and direct labor costs. The rising production costs necessitate a thorough assessment of the current grinding machine capacity

and potential investment in new equipment to avoid excessive expenses. Regular updates and evaluations of the BEP forecasts, alongside dynamic adjustments in response to market conditions and external factors, are crucial. By proactively monitoring these variables and adjusting their business strategy accordingly, CV Hadori can better ensure long-term sustainability and maintain optimal profitability. This strategic approach will help the company navigate financial challenges and support effective planning for future growth.

CONCLUSION AND RECOMMENDATION

The data analysis for CV Hadori reveals that the company's production process is optimized, with residuals from fish cleaning contributing to additional revenue. However, environmental conditions significantly impact operations. Forecasts using linear trends predict raw material needs of 1,029,960 kg in 2024, increasing to 1,112,160 kg in 2025 (a 7.98% rise), and 1,194,360 kg in 2026 (a 7.39% increase). Production forecasts show 506,800 kg in 2024, rising to 546,980 kg in 2025 (a 7.92% increase), and 587,160 kg in 2026 (a 7.34% rise). These forecasts imply that CV Hadori should proactively plan for increased material and production capacities to align with anticipated growth, thereby ensuring efficient scaling and sustained business viability amidst variable environmental conditions.

ADVANCED RESEARCH

Based on the findings, several recommendations are proposed for CV Hadori to enhance its business operations. First, the company should adjust fish prices to account for fluctuations due to unstable environmental conditions, ensuring revenue stability. Second, comprehensive transaction recording is crucial for more accurate production and raw material forecasts, aiding in long-term planning. Third, allocating a budget for the maintenance of key assets, like fish grinders, is essential to prevent future cost increases and asset depreciation. Lastly, CV Hadori must address non-operational factors, including government policy changes, economic stability, market demand and supply, political conditions, and industry competition, to effectively anticipate external shifts and sustain its business in the long term. Implementing these strategies will help CV Hadori to optimize costs, boost revenue, and secure operational stability.

ACKNOWLEDGEMENT

We would like to thank all the parties involved in this research.

REFERENCES

Ahyari, A. (2007). *Manajemen produksi pengendalian produksi* (3rd ed.). BPFE.

Ananda, G., & Hamidi, H. (2019). Analisis break even point sebagai alat perencanaan laba pada perusahaan manufaktur sub sektor makanan dan

minuman yang terdaftar pada Bursa Efek Indonesia tahun 2014-2017. *Measurement Jurnal Akuntansi*, 13(1), 1-10.

Anderson, E., & Parker, G. (2022). *Operations management* (2nd ed.). International Journal of Service Industry Management, 10(2). https://doi.org/10.1108/ijsim.1999.10.2.2.2

Assauri, S. (2008). *Manajemen produksi dan operasi*. Lembaga Penerbit Fakultas Ekonomi Universitas Indonesia.

Eunike, A., Setyanto, N. W., Yuniarti, R., Hamdala, I., Lukodono, R. P., & Fanani, A. A. (2021). *Perencanaan produksi dan pengendalian persediaan: Edisi revisi*. Universitas Brawijaya Press.

Haobenu, S. E., Nyoko, A. E. L., Molidya, A., & Fanggidae, R. E. (2021). Perencanaan persediaan bahan baku pada UMK Tiga Bersaudara Kota Kupang dengan metode economic order quantity (EOQ). *Reviu Akuntansi, Manajemen, Dan Bisnis*, 1(2), 61–75.

Lie, J. M., Raya, U. R., & Sarong, Y. (2022). Analisis perencanaan luas produksi keripik singkong pada usaha kecil menengah (UKM) Hidayah dan Mai Ona di Kota Atambua. *Jurnal Bisnis & Manajemen*, 14(1), 53-59.

Manullang. (2005). *Manajemen produksi dan operasi*. Grasindo.

Munawir, S. (2006). *Manajemen produksi dan operasi*. Grasindo.

Reksohadiprojo, S., & Gitosudarmo, I. (2000). *Manajemen produksi*. BPFE.

Riyanto, B. (2008). *Dasar-dasar pembelanjaan perusahaan* (4th ed.). BPFE.

Riyanto, S., & Rahman, P. A. (2022). *Metode riset penelitian kesehatan dan sains*. Deepublish.

Salu, N. D., & Nyoko, A. E. L. (2018). Pengendalian persediaan bahan baku papan jati pada CV. Murah Jaya Meubel di Kota Kupang. *Jurnal Transformatif Unkriswina Sumba*, 8(1), 15–24.

Slack, N., & Jones, A. B. (2021). *Operations and process management: Principles and practice for strategic impact*. Pearson Education Limited.

Stevenson, W. J. (2021). *Operations management* (14th ed.). McGraw-Hill Education.

Reksohadiprojo, S., & Gitosudarmo, I. (2007). *Manajemen produksi* (Revised ed.). BPFE.

Supuwiningsih, N. N., Kusuma, A. S., Pratiwi, E. L., & Pratami, N. W. C. A. (2022). *Statistik forecasting dalam sistem informasi geografis*. Penerbit Media Sains Indonesia.