WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

Analysis of Fishermen's Satisfaction Levels and Development Strategies for the Tegalsari Archipelago Fishing Port

Alif Ihsanulhaqi Yoris[1], Abdul Kohar Mudzakir[2], Bogi Budi Jayanto[3]

[1]Undergraduate Program of Capture Fisheries, Diponegoro University, Semarang, Indonesia
[2,3]Department of Capture Fiheries, Faculty of Fisheries and Marine Science, Diponegoro University, Semarang, Indonesia

A B S T R A C T

As a Class B Fishing Port located on the northern coast of Java, the Tegalsari Archipelago Fishing Port serves as the central hub for fisheries activities in Tegal City, handling large-scale fish landings and various supporting activities related to fisheries. Nevertheless, ensuring optimal service quality and facilities remains a challenge in sustaining and improving both productivity and the welfare of fishermen. This study aims to directly examine the current conditions of capture fisheries at Tegalsari, analyze fishermen's satisfaction with the port's facilities and services, and formulate appropriate development strategies for policy-making in port management and development. The research uses a descriptive approach involving field surveys, observations, interviews, and documentation. The sample was selected using the snowball sampling method, involving 40 fishing vessels over 30 GT, with one fisherman representative from each vessel. Data analysis includes validity and reliability testing, the Customer Satisfaction Index (CSI), and Importance Performance Analysis (IPA) to assess fishermen's satisfaction. Development strategies are formulated using SWOT analysis, identifying strengths, weaknesses, opportunities, and threats (internal and external factors). The findings of this study are expected to provide an up-to-date overview of field conditions at the Fishing Port of Tegalsari, particularly in relation to fishermen's satisfaction with various service aspects that require improvement, as well as to propose sustainable development strategies aimed at enhancing operational performance and fishermen's welfare. This study is also expected to serve as a valuable input for stakeholders in planning and policymaking concerning port management.

Keywords: Development Strategies, Facilities, Fishing Port, Satisfaction, Service

1. Introduction

Tegalsari Archipelago Fishing Port is located at 109°10'0" East Longitude and 07°01'0" South Latitude (Tegalsari Village, Tegal City). This class B port is the center of fisheries activities in the Java Sea (WPP 712). Since its inauguration on July 4, 2004, this port has supported large-scale fish landing operations, storage, and post-harvest handling. According to Satari et al. (2015), local fishermen conduct one-day fishing in coastal areas for local and regional markets. Optimal port performance significantly influences the productivity and participation of fishermen, so the development of facilities and services must be in line with the growth of community fisheries businesses.

Fishing ports play a vital role as service centers, protection, and landing points for catches, as well as connecting sea-land (operational) activities. The quality of service and operational efficiency of fishing ports clearly impacts the fishermen's welfare and fisheries productivity. According to Agustina et al. (2019), the Tegalsari Fishing Port needs to improve its facilities and services to support fisheries production. This study analyzes fishermen's satisfaction with the facilities and services at the Tegalsari Fishing Port through identifying development factors, incorporating fishermen's opinions as a basis for formulating port development strategies.

Tegalsari Port, as a center for fisheries activities, play a crucial role in ensuring adequate facilities and services to boost fishermen's productivity. This study analyzes the performance of facilities (dock, pool, breakwater) and services based on fishermen's perceptions, including the level of suitability of performance and their importance. The results will identify strategic factors for the development of Tegalsari fishing port, with a focus on improving loading and unloading efficiency and simplifying procedures to meet the expectations of fishermen as the primary users.

The objectives of conducting research related to the analysis of the level of fishermen's satisfaction and the development strategy of the Tegalsari Fishing Port are as follows:

1. Find out firsthand the condition of capture fisheries from the Tegalsari Archipelago Fishing Port.
2. Analyzing the level of fishermen's satisfaction with the facilities and services available at the Tegalsari Archipelago Fishing Port.
3. Formulate development strategies that will be implemented in the development process of the Tegalsari Archipelago Fishing Port.

2. Materials and Methods

2.1 Materials

Materials are components used as objects of observation and reflection during the research process. The study examined the satisfaction levels of fishermen, both as users of facilities and recipients of port services, and the development strategy for the Tegalsari Port Development Plan. The types of tools used in the research process at Tegalsari fishing port include laptop, microsoft excel, mobile phone, questionnaire, work stationery, and boots.

2.2 Methods

The method used in this study is a descriptive method that utilizes surveys and direct observations in the field. The sampling method used is snowball sampling, with stages starting with direct condition analysis with respondents (fishermen) who are users of port facilities and services. The initial small sample size will be increased through several steps. It begins with selecting one or two individuals as key respondents, then continues with seeking additional respondents to increase the data collection. This procedure will continue until the sample size is sufficient.Forty fishermen from 40 different vessels were selected as respondents to obtain more representative data and maximize results. The sample size varied depending on port conditions.

The data analysis method used in this study was to determine the level of fishermen's satisfaction with port performance and to develop strategies for port development. The process involved tabulating data based on classification and technical processing based on the research objectives. The data analysis method utilized the Customer Satisfaction Index (CSI) and Importance-Performance Analysis (IPA) for satisfaction analysis, as well as a SWOT (Strengths, Weaknesses, Opportunities, and Threaths) analysis for development strategy analysis.

Fishermen's satisfaction with the condition of port facilities and services is the primary data that will undergo analysis. Data on fishermen's satisfaction levels were obtained through direct interviews using a questionnaire. Appropriate questions can be tested for validity using factor analysis. Factor analysis is conducted by correlating instrument item scores within a factor, followed by correlating the factor scores with the total score obtained.

1. Validity Test

Data obtained through questions in a questionnaire can be declared valid through a validity test. Appropriate questions will be tested for validity using factor analysis. Factor analysis is performed by correlating the scores of instrument items within a factor and correlating the factor scores with the total score. According to Yusuf (2018), the validity test uses the following formula:

$$\boldsymbol{rXY = \frac{n\sum XlYl - (\sum Xl)(\sum Yl)}{\sqrt{[n\sum Xl2 - (\sum Xl)2][n\sum Yl2 - (\sum Yl)2]}}}$$

Information:

r_{xy} = Correlation coefficient between the level of fishermen's satisfaction with port performance

n = Number of samples

X = Satisfaction variable

Y = Performance variables

The coefficient value obtained determines the validity of each questionnaire asked in the interview. The higher the coefficient value, the better the questionnaire and the more suitable it is to proceed to the next stage. The minimum requirement for a valid score is that the calculated value exceeds the tabulated r value.

2. Reliability Test

Continuing with the reliability test to ensure the consistency of the measuring instrument in its use, even if used repeatedly at different times. Questions can be declared reliable if they have a reliability coefficient value > 0.6. The reliability test will be conducted after the validity test stage to select whether the questions are valid or not. According to Sugiyono (2013) in Mukmin and Wulandari (2017), reliability testing can use the following alpha formula:

$$\boldsymbol{r11 = \frac{k}{k-1} \times (1 - \frac{\sum Si}{St})}$$

Information:

r_{11} = Reliability value

∑Si = Total variance of scores for each item

St = Total variance

k = Number of items

The questionnaire data that has gone through the two processes above will be used in the measurement process using a customer satisfaction measurement tool. The satisfaction measurement tool used in this study is the Customer Satisfaction Index (CSI) method.

a. Customer Satisfaction Index (CSI)

This method is a scale that describes the level of customer satisfaction with the service provided based on the importance of each attribute. The CSI score is obtained by dividing the average satisfaction score by the maximum scale. According to Guswanto et al. (2012), the CSI method involves several stages in the calculation process, as follows:

1. Calculate the Mean Importance Score (MIS), the average score of each item (question) at the importance level and the Mean Satisfaction Score (MSS), the average score of each item at the performance level.
2. Calculating the Weighting Factor (WF), namely changing the average importance value into a percentage figure of the total average level of importance of all the variables tested, so that the total WF is 100%.

$$WF = \frac{AIS}{\sum AIS} \times 100\%$$

Information:

WF = Weighting Factor (100%)

AIS = Average Importance Score

3. Calculating the Weighted Score (WS), which is the multiplication value between the average performance or satisfaction level (RSK) of each variable and the WF of each variable.

$WS = APS \times WF$

Information:

WS = Weighted Score (%)

APS = Average Performance Score

4. Calculate the Total Weight (WT), which is the total of the overall WS values.

$WT = WS1 + WS2 + \ldots WSn$

5. Calculating the Customer Satisfaction Index (CSI), namely the calculation of WT divided by the maximum scale (in this study the maximum scale used is 5) which is then multiplied by 100%.

$$CSI = \frac{WT}{\text{maximum scale}} \times 100\%$$

The CSI is useful for comparing satisfaction levels with a service and monitoring its progress. According to Fitriani et al. (2018), measuring overall customer satisfaction can be expressed on a scale with the criteria presented in Table 1.

Table 1 - Customer Satisfaction Level Measurement

Scale	Information
0.00 - 0.34	Very Dissatisfied
0.35 - 0.50	Less Satisfied
0.51 - 0.65	Quite Satisfied
0.66 - 0.80	Satisfied
0.81 - 1.00	Very Satisfied

Source: Fitriani *et al*., 2018

b. Importance-Performance Analysis (IPA)

The Importance-Performance Analysis (IPA) method is a technique for measuring each aspect of a service, based on its level of importance to customers, compared to a performance score. The use of the IPA method determines the priority order of factors that can be used to analyze the determinants of

customer satisfaction and what needs to be improved in performance. According to Indrajaya (2018), the calculation stage for determining the satisfaction performance score is carried out using the IPA method as follows:

1. Determine the level of fit between importance and performance

$$Tki = \frac{xi \times 100\%}{yi}$$

Information:

Tki = Respondents's Suitability Level

xi = Performance Score (*x* to *i*)

yi = Importance Value (*y* to *i*)

2. Calculate the average importance value and all attribute performance

$$\bar{X} = \frac{\sum xi}{n}; \bar{y} = \frac{\sum yi}{n}$$

Information:

$\bar{X}$ = Average Score Performance of each Variable

$\bar{y}$ = Average Importance Score of each Variable

n = Number of Respondents

3. Create a Cartesian diagram, namely a coordinate system that determines position with the following quadrants:

Quadrant I	**Quadrant II**
Quadrant II	**Quadrant IV**

Fig. 1 - Science Analysis Diagram

- Quadrant I: Service attributes that users consider important but whose performance is still unsatisfactory. Therefore, these factors must be improved immediately (Top Priority).
- Quadrant II: Service attributes that are important to users, while service provision is also well-established, become a standard that must be maintained (Maintain Performance).
- Quadrant III: Service attributes that are considered not so important by users, while the service is also carried out with mediocre performance (Low Priority).
- Quadrant IV: Service attributes that are not actually important to the user, but are provided at full capacity, are therefore considered wasteful (excessive).

Port development strategy analysis is part of efforts to optimize ongoing fisheries activities. A SWOT analysis is used to determine the level of readiness of each overall function to achieve targets. According to Rangkuti (2013), there are several stages of a SWOT analysis, including:

1. The data collection stage, namely in the form of evaluation data for internal and external factors.
2. The analysis stage, namely the stage of creating internal, external and SWOT matrices.
3. Decision-making stage

The process of creating internal and external matrices has the following stages:

1. Column 1 is created to contain a composition of factors from the port which are divided into two (internal and external).
2. Column 2 contains the weighting given to each factor with the following details:

- 0.20 = very strong
- 0.15 = above average
- 0.10 = average
- 0.05 = below average
- 0.00 = no effect

3. Column 3 is created to fill in the calculation of ratings on factors based on their influence on the conditions of Tegalsari Fishing Port. The value range used is 1-4 with the following details:

- 1 = Not Important
- 2 = Less Important
- 3 = Important
- 4 = Very Important

4. Column 4 is created to present the value of the product of the weight and the rating.
5. The results obtained from the total score of each internal and external factor will be useful for compiling a SWOT matrix in determining development strategies.

A SWOT analysis was used to formulate a development strategy for the Tegalsari Fishing Port by evaluating internal and external factors. Internal factors include facilities, human resources, and services within the port, while external factors include human resources, the environment, fish prices, and technology. The results of this analysis are presented in Table 2 and 3 as a basis for developing the development strategy.

Table 2 - Internal Factors in Determining Development Strategy

Internal Factors	**Weight**	***Rating***	**Weight × Rating**
Strength			
Complete facilities at Tegalsari Fishing Port			
Strategic location of the Fishing Port			
Experienced Human Resources Department			
Easy and fast licensing services (sailing license)			
Weakness			
Basic port facility standards			
Silting of the harbour basin			
Facility layout at Tegalsari Fishing Port			
Low competency of human resources (fishermen)			
Total			

Source: Research, 2024

Table 3 - External Factors in Determining Development Strategy

External Factors	**Weight**	***Rating***	**Weight × Rating**
Opportunity			
Increasing demand for fish products			
Price movements of fish products			
Potential for the private sector to be an investor			
Fairly extensive marketing and distribution network			
Threat			
The location of the fishing ground			
Fish populations in the sea (overfishing)			
Total			

Source: Research, 2024

3. Results and Discussion

Location Overview

Tegalsari Archipelago Fishing Port is located in Tegalsari Village, West Tegal District, Tegal City (precisely 109°10'0" East Longitude, 07°01'0" South Latitude) with an area of 17.2 ha has a major role in the interests of the fisheries industry, such as cold storage, workshops, offices (service units), and shops located within the port area and supported by security facilities. Facilities such as anchorage pool (17 ha) and docks (0.15 ha) experience over-capacity by accommodating 100-150 GT vessels that exceed the capacity of 30-50 GT. Dense activity causes obstacles and queues of ships. Despite being a major contributor to non-tax revenue in the fisheries sector, facilities and services have not been able to support the high activity of the port.

As one of the main fishing ports in Central Java Province, operations at Tegalsari fishing port play a crucial role in supporting the fisheries business network. Facilities are still under development, in line with the port's upgrade at the end of 2024. The following is a list of Tegalsari fishing port main facilities, presented in table below:

Table 4 - Basic Facilities at Tegalsari Archipelago Fishing Port

Facility Type	Length/Area	Information
Shipping Route	6000 m^2	depth < 3 m
Breakwater (west & north)	650 m & 700 m	
Dock (unloading & mooring)	358 m^2 & 694 m^2	depth < 3 m
		ship $\pm$ 25 unit
		length < 21 m
		width < 6 m
Navigation Facilities (lighthouses & guide beacons)		2 beacon signs
		1 guiding beacon
Connecting Road	2248 m	
Pool (anchor & supplies)	16.4 ha & 2.6 ha	depth < 3 m
		ships < 500 units
		length < 21 m
		width < 6 m
Land	17.2 ha	active + 12.5 ha
Revetment	1657.8 m	

Source: Tegalsari Archipelago Fishing Port (Integrated Service Unit) Data, 2024.

Fishermen's Satisfaction Level

Fishing ports not only provide facilities for unloading and handling catches, but also provide effective services for fishermen. According to Lubis (2012), ports need to handle loading and unloading quickly, maintain fish quality, and facilitate marketing through auctions that benefit both fishermen and traders. Fisherman satisfaction is a clear indicator of service quality, which must be responsive to user needs. Analysis of fishermen's satisfaction levels was conducted using two methods, namely CSI and IPA, in an effort to determine the level of satisfaction, level of importance, and performance of the facilities and services available at the port.

a. Customer Satisfaction Index (CSI)

The CSI method is applied to evaluate the extent to which the performance of basic port facilities, which support fishing operations, has met fishermen's expectations. This method will generate a satisfaction score for fishermen (as customers) regarding the facilities and services they receive. The CSI results below demonstrate fishermen's satisfaction with Tegalsari Fishing Port. The following are the three basic facilities that were the object of the fisherman satisfaction score review:

1. Pool

The fishing port's pool facility are designed to accommodate fishing vessels for mooring, anchoring, and replenishing supplies. They also serve as maintenance facilities for vessels and fishing gear, and to ensure their condition before operations. These facilities are crucial for supporting the activities at the fishing port. Research findings on the level of satisfaction among fishermen using the pool facilities are presented in table below:

Table 5 - CSI Calculation Results for Pool Facility

Attribute	Average Importance (MIS)	Average Performance (MSS)	Score MIS × MSS	Weighting Factor (WF)	Weighted Score (WS)
1	4.47	2.43	10.86	0.156	0.379
2	3.92	2.45	9.60	0.137	0.336
3	4.47	2.23	9.97	0.156	0.348
4	4.76	2.13	10.14	0.166	0.353
5	3.92	2.38	9.33	0.137	0.326
6	3.76	3.38	12.71	0.131	0.443
7	3.32	2.60	8.63	0.116	0.302
WT= ∑ WS					2,487
CSI= (WT/5) × 100%					49.74%

Source: Research, 2025.

Based on Table 5 above, the CSI percentage was 49.74%, indicating dissatisfaction with the pool facility. Fishermen believe this facility is not up to standard, with the area restricting boat movement and prone to shallowing, which can lead to shipwrecks. This is an obstacle that must be addressed immediately by the port to maintain operational standards.

2. Dock

Dock facility play an important role in supporting the primary activities of fishing vessels, including loading and unloading catches, refueling, and product distribution. As the operational center of the port, docks play a crucial role in ensuring smooth operations, from receiving the catch to distributing it to clients (or traders). The efficiency of these facilities directly impacts fishermen's productivity and overall port performance. Research findings related to the level of satisfaction of fishermen as users of this facility are presented in table below:

Table 6 - CSI Calculation Results for Dock Facility

Attribute	Average Importance (MIS)	Average Performance (MSS)	Score MIS × MSS	Weighting Factor (WF)	Weighted Score (WS)
1	4.55	2.45	11.15	0.164	0.402
2	3.88	2.53	10.20	0.140	0.354
3	4.50	2.58	11.61	0.162	0.418
4	3.63	2.50	9.08	0.131	0.328
5	4.10	2.30	9.43	0.148	0.340
6	3.63	3.45	12.52	0.131	0.452
7	3.43	2.63	9.02	0.124	0.326
WT= ∑ WS					2,620
CSI= (WT/5) × 100%					52.40%

Source: Research, 2025.

Based on Table 6, which presents the results of data processing related to fishermen's satisfaction with this facility, the CSI percentage was 52.40%, or quite satisfied. Fishermen believe that this facility can be given a "quite satisfactory" rating, reflecting its routine performance in supporting port operations. However, improvements are needed to prevent the unloading process and mooring from being disrupted by routine congestion.

3. Breakwater

Breakwater, considered a basic facility for fishing ports, serve as primary protection to mitigate the impact of tidal waves that can disrupt port activities. This facility is crucial for creating a stable environment and ensuring the continuity of port operations. Research findings on fishermen's satisfaction levels, or CSI, regarding breakwater facility presented in table below:

Table 7 - CSI Calculation Results for Breakwater Facility

Attribute	Average Importance (MIS)	Average Performance (MSS)	Score MIS × MSS	Weighting Factor (WF)	Weighted Score (WS)
1	4.15	2.48	10.29	0.152	0.377
2	4.40	2.33	10.25	0.161	0.375
3	4.40	2.28	10.03	0.161	0.367
4	3.48	2.83	9.85	0.128	0.362
5	3.75	2.78	10.43	0.138	0.384
6	3.63	2.98	10.82	0.133	0.396
7	3.45	2.15	7.42	0.127	0.273
WT= ∑ WS					2,534
CSI= (WT/5) × 100%					50.68%

Source: Research, 2025.

Based on Table 7, which calculates the level of fishermen's satisfaction with the breakwater facilities at the fishing port, the CSI percentage is 50.68%, or quite satisfied. Fishermen are concerned that the facility, which act as harbour protectors, are not performing optimally in protecting the harbour basin from tidal waves. The breakwater needs to be renovated (and expanded) as the fishing port are already overcapacity.

b. Importance-Performance Analysis (IPA)

The Importance-Performance Analysis (IPA) method serves as a service quality measurement tool by comparing the level of importance and actual performance of each attribute. This method produces a four-quadrant graph: (I) high priority, (II) maintaining performance, (III) low priority, and (IV) excessive. The IPA method will provide guidance regarding the highest priority attributes for improvement, performance maintenance, and efficiency implementation. This aims to meet the level of satisfaction of fishermen. Based on the use of the IPA method in the data processing process, the following are the results obtained from the three main facilities at Tegalsari Fishing Port:

1. Pool

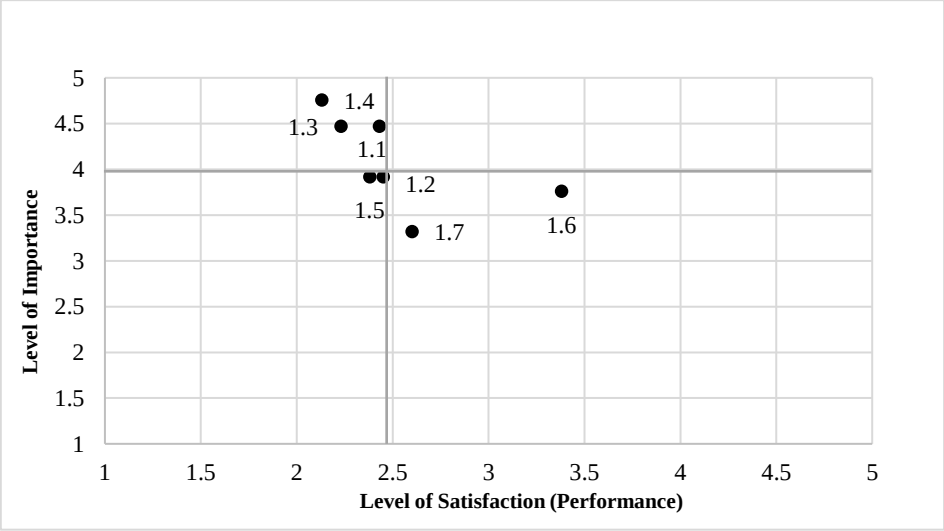

Fig. 2 - Important-Performance Analysis (IPA) Diagram of Pool Facility

Based on Figure 2 above, the Cartesian diagram of the pool facilities shows an interpretation based on the level of importance of each attribute. The results of the IPA show 4 quadrants consisting of quadrant I with 3 attributes, quadrant II without attributes, quadrant III with 2 attributes, and quadrant IV with 2 attributes. Quadrant I which contains 3 attributes is suspected to be the main priority to be improved for the smooth operation of the port. The three attributes in quadrant I include the shallow Pool Facility Condition (impacting the risk of shipwrecks), Response to Operational Constraints which are prone to occur, and Coordination of Ship Movements which is still prone to causing collisions and obstacles.Moving on to quadrant II, which houses attributes with high levels of importance and performance, there are no attributes found in this facility that are capable of providing maximum performance with their important roles.

Moving on to quadrant III, which contains two attributes with low priority status. The two attributes located in quadrant III are Service Capability in the Pond Area in the form of navigation assistance and pond maintenance, as well as Timeliness of Service that has not been resolved. Quadrant IV, which has the status of an excessive effort quadrant, indicates that the pond facility has two attributes in it. The two attributes located in quadrant IV are Facility Security, which is considered adequate, and Staff Ability to Serve Activity Needs in the Pond (assisting fishermen).

2. Dock

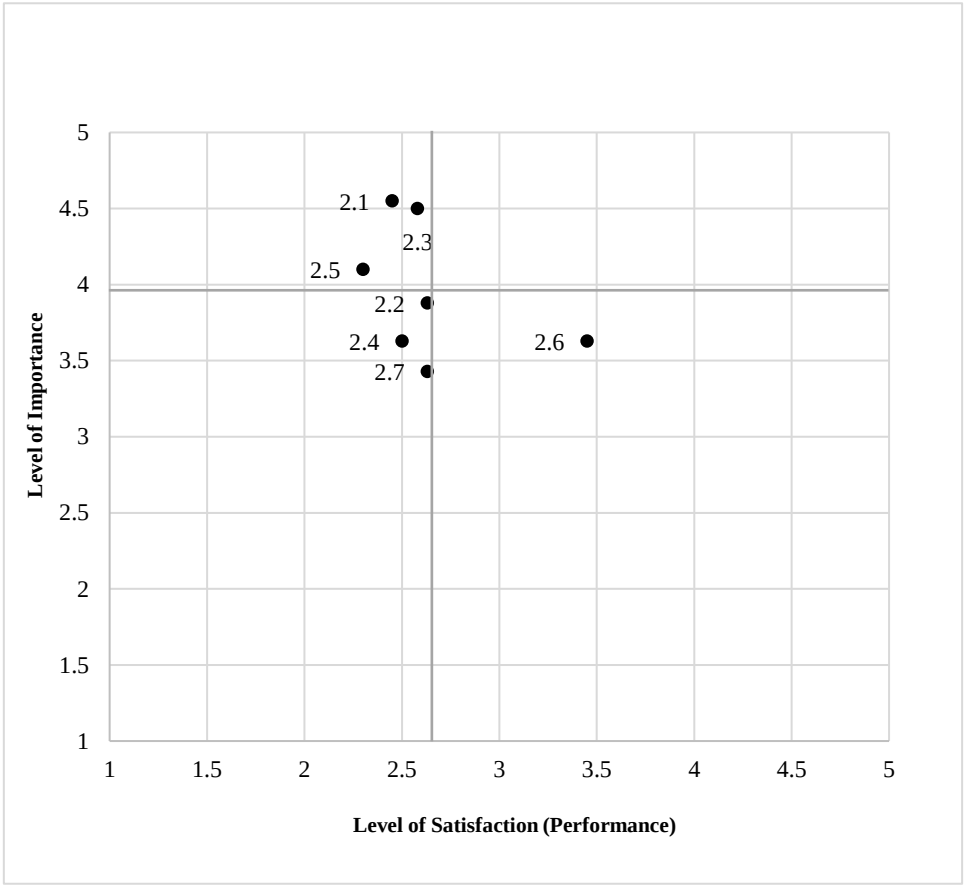

Fig. 3 - Important-Performance Analysis (IPA) Diagram of Dock Facility

Based on Figure 3 above, the Cartesian diagram of the dock facilities shows an interpretation based on the level of importance of each attribute. The results of the IPA show 4 quadrants consisting of quadrant I with 3 attributes, quadrant II without attributes, quadrant III with 3 attributes, and quadrant IV with 1 attribute. Quadrant I which contains 3 attributes has the status of the main priority to be improved for the provision of maximum facilities and services. The three attributes of quadrant I, including the Condition of Dock Facilities which are poorly maintained and have overcapacity status, Smoothness in the Ship Mooring Process which has not been maximally coordinated, and Timeliness of Service related to overcapacity status and duration of unloading the catch.

Moving on to quadrant II, which contains attributes with high levels of importance and performance, unfortunately, no attributes of the dock facilities were found to perform optimally for their important role. Moving on to quadrant III, which contains three attributes with low priority status. The three attributes in quadrant III are Service Capability in the Dock Area related to unloading catches, which is not so important, Response to Facility Constraints from Officers to overcome operational obstacles, and Officers' Ability to Meet Dock Needs, which is considered a non-priority. Quadrant IV is a quadrant with overperformance, indicating the presence of one attribute. This one attribute is Facility Security, which is considered sufficient by fishermen.

3. Breakwater

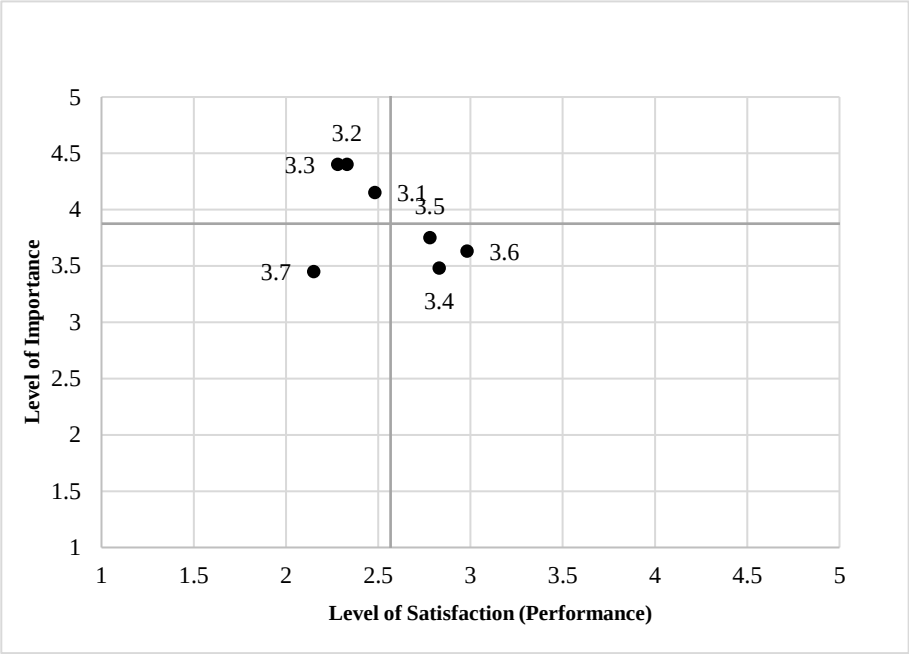

Fig. 4 - Important-Performance Analysis (IPA) Diagram of Breakwater Facility

Based on Figure x above, the Cartesian diagram of the breakwater facility shows an interpretation based on the level of importance of each attribute. The results of the IPA show that the four quadrants consist of quadrant I with 4 attributes, quadrant II without attributes, quadrant III with 1 attribute, and quadrant IV with 2 attributes. Quadrant I with 3 attributes in it, is suspected to be the main priority to ensure the smooth operation of the port. Attributes in quadrant I include the Readiness of Breakwater Facilities which play an important role in facing changes in tidal waves, the Condition of Breakwater Facilities with conditions that are monitored to experience erosion that need to be repaired immediately, the Accuracy of Breakwater Facility Design that needs to be improved (width, height, length, and channel design) to be more ideal, and the Protection of Fishing Vessels.

Moving to quadrant II with attributes of high importance and performance. Unfortunately, no breakwater facility attributes with maximum performance and important roles were found. Shifting to quadrant III which contains 1 attribute with low priority status. The attribute in quadrant III is a Response to Fishermen's Input regarding Facilities that has not been responded to, but this is not urgent. Quadrant IV with high performance, shows the breakwater facility has 2 attributes with low importance. The two attributes are the Response of Officers if the Breakwater is not functioning optimally and the Impact of Breakwater Facilities on Ship Entry and Exit Routes with renovation as the priority of both.

Development Strategy

A SWOT analysis was used to develop the Tegalsari PPN development strategy by evaluating both internal and external factors within the port. These factors were identified through field observations and interviews with key informants and analyzed to address issues, solve problems, and optimize potential. The following identifies the two factors influencing the Tegalsari PPN development strategy:

1. Internal
    a. Strengths

- Complete facilities at Tegalsari Fishing Port, proven by the positive response from fishermen as users.
- The strategic location of Tegalsari, marketing, distribution, and positive evidence from other external factors.
- The experienced and competent HRD at Tegalsari Fishing Port is proven by the quality of service.
- Easy licensing services are a positive response from fishermen regarding services at the service unit.

    b. Weaknesses

- The standard of basic facilities at Tegalsari Fishing Port, is proven by the results of the analysis of 3 basic facilities in the research.
- The shallowing of the harbour basin is a major complaint of fishermen due to the risk of shipwrecks.
- The layout of facilities at Tegalsari Fishing Port has an impact on the pattern of port activities being hampered at the dock.
- The low competency of human resources (fishermen) shows that > 75% of fisherman sources have only elementary school education.

2. External

a. Opportunities

- The increasing demand for fish products, one of the fishing ports that contributes the most to Non-tax Revenue.
- Price movements of fish products, from the percentage of production & production value of Tegalsari Fishing Port (2021-2023).
- The potential for the private sector to be present as investors, port development in the form of cold storage investors.
- A fairly extensive marketing and distribution network is able to attract client interest and sales power.

b. Threats

- The more remote the fishing ground location, the more it will impact operational costs and productivity.
- Fish populations are impacted by overfishing, making fishing more difficult due to declining stocks.

Identification of internal factors (strengths/weaknesses) and external factors (opportunities/threats) of PPN Tegalsari, followed by the preparation of a matrix to produce 4 alternative development strategies (SO, WO, ST, WT). The results of the SWOT matrix analysis related to the preparation of alternative strategies are presented in Table 8 below:

Table 8 - SWOT Matrix

Internal **External**	**Strengths** 1. Complete facilities at Tegalsari Fishing Port 2. Strategic location of Tegalsari 3. Experienced HRD at Tegalsari Fishing Port 4. Easy and fast licensing services	**Weakness** 1. Basic port facility standards 2. Silting of the harbour basin 3. Facility layout Tegalsari Fishing Port 4. Low competency of fishermen
Opportunities 1. Increasing demand for fish products 2. Price movements of fish products 3. The potential for the private sector to be present as an investor 4. A fairly extensive marketing and distribution network	**SO Strategy** **SO1.** Utilizing superior facilities and human resources to attract investors (S1, S3, O3) **SO2.** Utilizing strategic locations and maintaining service quality to establish partnerships (S2, S3, O4)	**WO Strategy** **WO1.** Embracing private investors as a key factor in project success (W1, W2, O3) **WO2.** Revitalization of Facility Layout Based on Fishermen and Distributor Needs (W3, O1, O4) **WO3.** Conduct training sessions for fishermen regarding opportunities from increased demand and product price movements (W4, O1, O2)
Threats 1. Location of the fishing ground 2. Fish populations (overfishing)	**ST Strategy** **ST1.** Service innovation in the form of “multi-trip permits” (conditional) for fishermen affected by the movement of fishing grounds (S3, T1) **ST2.** Prioritize licensing services (SPB) for fishermen with environmentally friendly fishing gear (S4, T2)	**WT Strategy** **WT1.** Maximizing “Fishermen's Special Gas Stations” by negotiating wholesale fuel prices with Pertamina (W1, T1) **WT2.** Conducting training for fishermen on the importance of sustainable fishing (W4, T2)

Source: Research, 2025

Table 8 above presents the SWOT Matrix, which play a crucial role in helping formulate development strategies. Using this matrix, four alternative strategies are generated: the SO (Strengths-Opportunities) Strategy with two combinations of elements, the WO (Weaknesses-Opportunities) Strategy with three combinations of elements, the ST (Strengths-Threats) Strategy with two combinations of elements, and the WT (Weaknesses-Threats) Strategy with two combinations of elements.

The factor scoring process was conducted through a comprehensive analysis of SWOT aspects. The weighting and rating for each factor were determined based on respondent data. The scoring and weighting results for the internal and external factors of Tegalsari Fishing Port are presented in Table 9 and 10 below:

Table 9 - Internal Factor Scoring Analysis

Internal Factors	**Weight**	**Rating**	**Score**
Strengths			
Complete facilities at Tegalsari Fishing Port	0.32	3.63	1.16
Strategic location of Tegalsari	0.24	2.73	0.64
Experienced HRD at Tegalsari Fishing Port	0.22	2.83	0.62
Easy and fast licensing services	0.23	2.73	0.61
Weaknesses			
Basic port facility standards	0.26	-3.40	-0.89
Silting of the harbour basin	0.34	-3.85	-1.30
Facility layout at Tegalsari Fishing Port	0.23	-2.83	-0.65
Low competency of human resources (fishermen)	0.21	-2.16	-0.54
Total			-0.39

Source: Research, 2025

Table 10 - External Factor Scoring Analysis

External Factors	**Weight**	**Rating**	**Score**
Opportunities			
Increasing demand for fish products	0.25	3.10	0.79
Price movements of fish products	0.26	3.13	0.82
The potential for the private sector to be present as an investor	0.24	2.90	0.69
A fairly extensive marketing and distribution network	0.25	2.80	0.69
Threats			
The fishing ground location	0.26	-2.40	-0.63
Fish populations (overfishing)	0.30	-2.55	-0.76
Total			1.60

Source: Research, 2025

Based on the scoring results, values for internal and external factors are obtained. These values are then entered into the following grand strategy matrix:

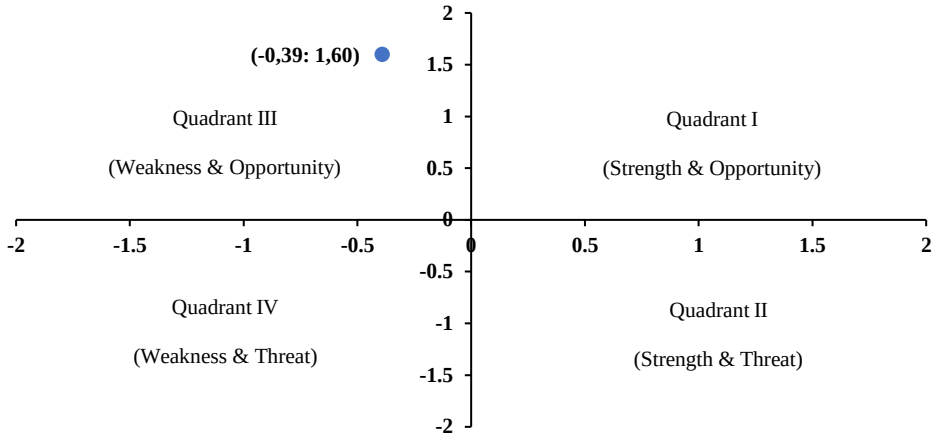

Fig. 5 - Development Strategy Matrix Quadrant

Source: Research, 2025.

Based on the matrix above, it can be seen that the chosen strategy is in Quadrant III, namely the WO (Weakness-Opportunity) strategy. This situation is suitable for the field conditions at Tegalsari Fishing Port. Alternative strategies with weaknesses and opportunities, namely minimizing internal weaknesses to maximize existing opportunities. The implementation of this strategy will lead to steps taken by port developer in utilizing opportunities to support efforts to improve facility and service standards. The following are alternative strategies in the Quadrant III group that can be applied in the Tegalsari Fishing Port development strategy:

1. Private investors can be involved in strategic projects, such as partnering on facility development to meet standards and implementing renovation projects through public-private partnerships. Partnerships with the private sector will clearly simplify processes often hampered by budget cuts and accelerate development, as well as projects that improve the quality of the port's performance.
2. The ever-increasing product demand and extensive marketing network can create opportunities for revitalization. Concrete steps that can be taken include zoning for workflow efficiency, conveyor construction, and the implementation of an automated queuing system (app implementation). All of these are aimed at reducing operational time and can serve as a foundation for port development.
3. Tegalsari Fishing Port can provide training for fishermen on opportunities arising from demand and product price movements. Fishermen respondents expressed interest and suggested that this training be directed at improving fishermen's skills, such as understanding market movements, product diversification, and making sales decisions in response to market demand.

4. Conclusion and Suggestions

A satisfaction analysis of fishermen at the Tegalsari Port Operations Office using the CSI method revealed a "moderately satisfied" level, with scores of 49.74% (pool), 52.40% (dock), and 50.68% (breakwater). The Importance-Performance Analysis (IPA) identified three top-priority attributes (Quadrant I), while Quadrant II remained empty. The SWOT-based development strategy placed internal and external factors in Quadrant III (WO), emphasizing collaboration with private investors, leveraging market demand, and providing training programs to enhance fishermen's skills in product diversification and market adaptation. Given the 50% satisfaction level, port management should prioritize comprehensive improvements in infrastructure quality and quantity while establishing two-way communication with fishermen to incorporate their feedback. Modernizing facilities, optimizing operational efficiency, and implementing ongoing training programs—supported by clear performance indicators—are essential to achieving sustainable port standards and improving fishermen's welfare. Further research is needed to monitor the strategy's implementation and ensure long-term success.

References

Achmad, A. S., and A. A. Indradewi. (2021). Legal Status and Liability of Intermediary Traders, Distributors, and/or Agents in the Distribution Channel of Goods. *Magnum Opus Law Journal*, 4(2): 193-212.

Agustina, S., A. N. Bambang, and I. Triarso. (2019). Development Strategy for Tegalsari Coastal Fishing Port in the City of Tegal. *Journal of Fisheries Resources Utilization Management and Technology*, 8(1): 57-66.

Ariadi, H., R. A. N. Hasan., T. Mujtahidah, and A. Wafi. (2022). Opportunities for Developing Capture Fisheries Production in Tegal and Pekalongan Regencies in the Future. *AGROMIX*, 13(2): 152-158.

Ariani, F., I. Limbong., T. Heriyanto, and A. Paradini. (2020). Study of the Utilization of Sibolga Archipelago Fisheries Port Facilities. *Maritime Journal*, 2(1): 21-30.

Banjarnahor, Y. A., E. Yulinda, and V. Amrifo. (2019). The Role of Sibolga Nusantara Fisheries Port Toward the Rural Labor Absorption in Pondok Batu Village, Sarudik District, Center Tapanuli Regency, North Sumatera Province. *Journal of Fisheries*, 2(1): 1-13.

Dewi, K. I. L., N. N. Yulianthini, and N. L. W. S. Telagawathi. (2019). The Influence of Service Quality Dimensions on Customer Satisfaction of BPJS Health Users in Singaraja City. *Bisma*: *Journal of Management*, 5(2): 82-92.

Fada. A. T., M. Kurnia, and A. Mallawa. (2021). Operational Performance of the Paotere Fish Landing Base, Makassar City. *Torani*: *JFMarSc*, 4(2): 110-124.

Fazri, K., R. Rizwan, and Z. Jalil. (2018). Analysis of Activity Aspects at the Sawang Ba'u Fish Landing Base, South Aceh Regency. *Unsyiah Marine Fisheries Student Scientific Journal*, 3(3): 161-173.

Fitriani., B. A. Wibowo, and A. K. Mudzakir. (2018). Analysis of the Satisfaction Level of Fishermen, Fish Merchants, and Fish Processors on the Service Performance of Banyutowo Fish Landing Base, Pati Regency, Central Java. *Journal of Fisheries Resources Utilization Management and Technology*, 7(3): 22-31.

Guswanto, B., I. Gumilar, and I. Rostini. (2012). Analysis of Manager Performance Index and User Satisfaction Index at Nizam Zachman Ocean Fishing Port, Jakarta. *Journal of Marine Fisheries*, 3(4): 151-163.

Hamim. (1983). Indonesian Fishing Ports. Mina Color Bulletin II (4) Directorate General of Fisheries. Department of Agriculture Jakarta.

Hermawan, I. (2019). Quantitative, Qualitative, and Mixed Method Educational Research Methodology (pp. 204). Kuningan: Hidayatul Quran.

Indrajaya, D. (2018). Analysis of Service Quality on Consumer Satisfaction Level Using Importance Performance Analysis and Customer Satisfaction Index Methods at UKM Gallery. *Ikraith-Technology*, 2(3): 1-6.

Irham, I., K. H. Iksan, and H. Hardin. (2020). Evaluation of Functional Facilities of Bacan Coastal Fishing Port. *Journal of Archipelagic Marine Science*, 3(2).

Lase, R. C., A. J. Dawolo, and P. H. Telaumbanua. (2024). Analysis of Fishing Port Development Strategy in North Nias. *PERAUT*, 1(1): 16-21.

Lubis, E. (2012). Fishing Ports. Bogor: PT. IPB Press.

Machdani, S., K. E. Prihantoko, and A. Suherman. (2023). Level of Utilization of Fishing Port Facilities (Case Study: Lempasing Coastal Fishing Port). *Journal of Capture Fisheries* (*JUPERTA*), 7(2): 42-52.

Marengkeng, Y. S., U. Tangke, and R. Laisouw. (2023). Analysis of the Level of Fish Processing Satisfaction with the Services of the Ternate Nusantara Fisheries Port. *BIOSAINTEK Journal*, 5(2): 1-16.

Mukmin, M. N., and H. Wulansari. (2017). Accountability of Accountant Educator Performance Based on Accountant Competence and Professional Ethics (Empirical Study at Private Universities in Bogor). *Jurnal Akunida*, 3(2): 51-59.

Najah, R. A., E. Lubis, and R. Muninggar. (2012). Existence of Facilities by Activity in Lampulo Coastal Fishing Port, Banda Aceh. *Marine Fisheries*: *Journal of Marine Fisheries Technology and Management*, 3(1): 55-70.

Nugraha, N. B., A. Sellyana, and K. Karpen. (2021). Implementation of the Customer Satisfaction Index (CSI) Method to Analyze Customer Satisfaction at Family Supermarkets. *Mahajana Information Journal*. 6(2): 91-96.

Nugraha, S. (2007). Determining Sample Size Using the Slovin Formula. Padjajaran University. Bandung.

Nurhayati, D., and D. Atika. (2019). Operational Performance Analysis of the Eretan Indramayu Coastal Fishing Port. *Journal of Fisheries and Marine Sciences*, 1(2): 33-45.

Nurseptiani, S., M. M. Kamal, T. Taryono, and D. Surjanto. (2021). Rights-Based Inland Fisheries Management in the Sebangau River, Sebangau National Park, Central Kalimantan. *Journal of Marine and Fisheries Socio-Economic Policy*, 11(2): 91-102.

Regulation of the Minister of Maritime Affairs and Fisheries Number 08 of 2012 concerning Fishery Ports.

Rachmawati, T. (2017). Data Collection Methods in Qualitative Research (pp. 29). Bandung: UNPAR Press.

Rangkuti, F. (2006). SWOT Analysis: Techniques for Dissecting Business Cases. Jakarta: PT. Gramedia Pustaka Utama.

Rangkuti, F. (2006). SWOT Analysis Techniques for Dissecting Business Cases SWOT Analysis Method for Calculating Rating Weights and OCAL. Jakarta: PT. Gramedia Pustaka Utama.

Rangkuti, F. (2013). Customer Service Satisfaction & Call Center Based on ISO 9001. PT. Gramedia Pustaka Utama.

Satari, F., A. Rosyid, and B. A. Wibowo. (2015). Analysis of the Suitability of Functional Facilities and Supporting Facilities of Ecoport-Based Fishing Ports at Tegalsari Coastal Fishing Port, Tegal. *Journal of Fisheries Resources Utilization Management and Technology*, 4(4): 135-147.

Sugiyono. (2013). Quantitative, Qualitative, and R&D Research Methods. Bandung: Alfabeta.

Supranto, J. (2021). Measuring Customer Satisfaction Levels to Increase Market Share. Jakarta: PT. RINEKA CIPTA, IKAPI.

Suryatama, E. (2014). SWOT Analysis. First edition. Surabaya: Kata Pena.

Syafrial, S., and E. Anthon. (2018). Analysis of Superior Commodities and Contribution of Capture Fisheries to Regional Original Income of Trenggalek Regency (Case Study at the Archipelago Fisheries Port of Trenggalek Regency. *Terubuk Fisheries Periodical*, 46(1): 78-86.

Syukri, S. H. A. (2014). Application of Customer Satisfaction Index (CSI) and Gap Analysis on Trans Jogja Service Quality. *Scientific Journal of Industrial Engineering*, 13(2): 103-111.

Wahab, A. (1997). Policy analysis, from formulation to implementation of state policy. Jakarta: Second Edition, Bumi Aksara.

Widi, R. K. (2018). Igniting Research; Introduction, and Guide to Research Implementation (pp. 312). Yogyakarta: Deepublish.

Yusup, F. (2018). Validity and Reliability Test of Quantitative Research Instruments. *Tarbiyah*: *Scientific Journal of Education*, 7(1): 17-23.

Zaluchu, S. E. (2020). Qualitative and Quantitative Research Strategies in Religious Research. *Evangelical*: *Journal of Evangelical Theology and Community Development*, 4(1): 28-38.