JURNAL PERIKANAN
UNIVERSITAS GADJAH MADA
Terakreditasi Ristekdikti No: 158/E/KPT/2021

ISSN: 2502-5066 (Online)
ISSN: 0853-6384 (Print)
Vol. 25 (1), 67-76
DOI 10.22146/jfs.79115

Evaluation of the Performance Improvement of the Muara Angke Nusantara Fishing Port (NFP) Jakarta

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Submitted: 11 December 2022; **Revised:** 18 Februry 2023; **Accepted :** 03 June 2023

ABSTRACT Fishing ports play an important role in facilitating fishing business activities and supporting fish resource management. The completion of facilities at fishing ports will aid in the continuation of fishing business operations. As a Fishing Port, the Muara Angke Nusantara Fishing Port must provide good services and respond to the needs of the Muara Angke fishery community, particularly for supporting industry in Jakarta. Therefore, the facilities of Muara Angke Nusantara Fishing Port must be evaluated (NFP). The study aimed to analyze the facilities at Muara Angke Nusantara Fishing Port to improve their performance by analyzing the conditions of the fishing port facilities, the level of utilization of the facilities, and the strategy for developing fishing ports with SWOT analysis so that they can contribute to supporting activities and the fishing industry in Jakarta. This research was carried out at the Muara Angke Fishing Port in July 2022. The study used a descriptive method. A purposive sampling method was used to collect data from 50 fishery business actors at the Muara Angke Fishing Port. The facility score was 2.5, indicating that the facilities at the Nusantara Fishery Port were good, but the level of utilization was low due to the length of the pier, the area of the pond, the depth of the harbor pool, and the utilization rate of the fish auction. The SWOT analysis indicated that the X; Y results were 0.12 and 0.54 which were located in quadrant I or the S-O (Strength-Opportunity) strategy. As a result, to increase the facility utilization rate score, the Muara Angke Archipelago Fishery Port (PPN) must improve services and attract investors.

Keywords: Development strategy; Muara Angke NFP; SWOT

INTRODUCTION

Fishing ports play important roles in facilitating fishing business activities and supporting fish resource management. Fishing ports also play an important role in the development of fisheries in general because they employ both fishery and non-fishery activities, as well as being centers of economic growth, which has an impact on the surrounding community's standard of living and welfare. According to Suherman (2010), one measure of the success of capture fisheries development is the development, construction, and management of fishing ports or fish landing bases, as well as optimizing their operations. The establishment of fishing ports and fish landing sites benefits the fishing port economy (Suherman & Mudzakir, 2022; Ningsih *et al*., 2022; Nurfadillah *et al*., 2022).

Fishing Port Management must provide good service to fisheries stakeholders and foster an environment conducive to using fishing port facilitation. Fishing port managers must prepare the necessary facilities, such as basic facilities, functional facilities, and supporting facilities, to provide good service. The facility must be operationally ready, and fishing port officers must be technically capable of running a fishing port.

Several studies on fishing ports in Indonesia have been conducted to analyze the services and performance of fishing ports. According to Nugraheni *et al*. (2013), CFP Tasik Agung has adequate facilities to support fishing activities. Suherman *et al*. (2020[a]) and Suherman *et al*. (2020[b]) conducted a study to assess the performance of NFP Karangantu and NFP Pengambengan in Jembrana, Bali, using the Structural Equation Modeling (SEM) method. The findings revealed that internal variables had the greatest impact on NFP Karangantu's performance, while NFP services had the greatest impact on NFP Pengambengan's performance.

Several studies focus on assessing the level of service at fishing ports using the IPA and CSI methods. Bayyinah *et al*. (2016) showed that fishermen in the Kejawanan NFP were very satisfied with the services provided by the port using the IPA and CSI methods. The service level at CFP Lampulo (Kutaraja) was at a low to moderate level (Rahma *et al*., 2018). Meanwhile, research at NFP Karangantu conducted by Diniah *et al*. (2020) showed that the level of satisfaction of fishermen with NFP Karangantu services ranged from 0.41 – 0.74. Services to fishermen that were considered not good were diesel fuel services with a value of 0.41 and services for ice needs with a value of 0.44.

Hutapea *et al*. (2017) analyzed the level of importance and performance of Nizam Zachman's Marine Fishing Port (OFP) using IPA (Importance Performance Analysis) analysis. The results of the study showed that PPS Nizam Zachman had an important role in production activities, infrastructure, and public services, but there were still several types of services that need to be improved. CFP Dobo in Maluku needs to increase fishermen's capacity (Rumadan *et al*., 2021). OFP Kutaraja in Aceh still needs to improve its facilities to meet the needs of its customers (Chaliluddin *et al*., 2021). CFP Brondong in Lamongan, East Java, needs to improve its fish auction facilities so that the auction/buying process is faster and more efficient (Fatmawati *et al*., 2015).

the Muara Angke Nusantara Fishing Port is expected to support fishery activities and industry in Jakarta. Because of the significance of NFP Muara Angke in Indonesia, particularly for fishery activities and industry in the Jakarta area, it is necessary to assess the facilities of Nusantara Fishing Port Muara Angke by analyzing the condition of fishing port facilities, facility utilization rate, and fishing port development strategy using SWOT analysis.

MATERIALS AND METHODS

Research methods

This study was carried out at Muara Angke Fishing Ports in July 2022. The descriptive method was used in the study. Purposive sampling was used to collect data from 50 respondents from Muara Angke Fishing Ports' fisheries business actors.

This study used descriptive methods by conducting direct observation activities at the Muara Angke fishing port and collecting data in both primary and secondary forms. Purposive sampling was a method used by researchers to select research subjects based on specific criteria. The research employed the purposive sampling method, which involved taking samples on purpose in line with the sample requirements needed to support the research (Imro'atun, 2017).

The following criteria were used to select respondents for this study: fishermen, fishing vessel supervisory staff, fish auction place employees, and fishery business owners/ managers in Muara Angke.

1. People involved in fishing port activities;
2. People who understand the research objectives;
3. People who are aware of the current state of Muara Angke Port; and
4. The Muara Angke land tenants who are still active.

Suparmoko (2003) describes the sampling formula as follows:

$$n = \frac{NZ^2P(1-P)}{Nd^2+Z^2P(1-P)}$$

Information:
N = The number of fishing gear or Total of land used;
d = Maximum acceptable error (0.1);
Z = Standard of normal variable (1.64);
P = Percentage of appointed variant (0.05).

The assessment of the completeness level of fishing port facilities was performed using a modified formula based on Ministerial Decree No. 08/MEN/2012 (Satari *et al*., 2015).

Fishing Port Score = (0.50 x basic facilities) + (0.33 x functional facilities) + (0.17 x supporting facilities).

Tabel 1. Assessment criteria for facility condition.

No.	Score	Description
1.	2.4-3	Very Proper
2.	1.7-2.3	Proper
3.	1-1.6	Not Proper

Source: Satari *et al*., 2017.

Analyzing the utilization rate of the facility

According to Yahya (2013), to analyze utilization rate as follows:

$$\text{Utilization Rate} = \frac{\text{Use of facilities}}{\text{Facility capacity}}$$

Information:
- Percentage of utilization > 100%, facility utilization rate is more than optimal condition;
- Percentage of utilization = 100%, facility utilization rate is in optimal condition;
- Percentage of utilization < 100%, the facility utilization rate is less than optimal.

According to Lubis (2011), to determine t the required fishing port as follows: Harbor Pool Area

$$L = Lt + (3 \times n \times l \times b)$$
$$= \pi l^2 + (3 \times n \times l \times b)$$

Information:
LK = harbor pool area (m^2);
n = maximum number of fishing vessels landing at fishing ports (units);
l = length of the largest fishing vessels (m);
b = width of the fishing vessel (m);
Lt = Turning area of the fishing vessel (m^2).

Harbor pond depth

$$D = d + \tfrac{1}{2}H + S + C$$

Information:
D = the depth of the fishing vessels lane;
d = fishing vessels draft;
H = maximum wave height (H max = 50 cm);
S = the height of the swing of the moving ship (10-30 cm);
C = safe distance between the keel and the bottom of the water (2.5-10 m).

Fish auction building area

$$S = \frac{n \times p}{r \times a}$$

Information:
S = area of the auction building (m^2);
N = average production amount per day (tons);
P = space capacity factor for production;
r = frequency of auction per day;
a = Ratio of the auction room and auction building.

Pier length

$$L = \frac{(l+s)n \times a \times h}{u \times d}$$

Information:
L = pier length (m);
l = average ship length (m) or average ship width (m);
s = distance between ships (m);
n = number of ships using the dock on average per day (units);
a = average ship weight (tons);
h = average length of ship at the pier (hours);
u = number of fish produced per day (tons);
d = average length of fishing trip (hours).

SWOT analysis

According to Rangkuti (2015), the steps for making internal and external matrices are as follows: A. Column I consists of all the factors owned by the company and is divided into two parts, namely internal factors/"IFE" (Internal Factor Evaluation) and external factors/"EFE" (External Factor Evaluation); B. The weighting of each factor in column 2, ranging from 2.0 (very important) to 0.0 (not important). Weights as shown in Table 2.

Table 2. Factor weight for swot analysis.

Score	Description
0.20	Very Satisfied
0.15	Satisfied
0.10	Barely Satisfied
0.05	Less Satisfied
0.00	Not Satisfied

Source: Rangkuti, 2015.

Column 3 consists of calculating these factors based on their impact on port conditions. The range of rating values is 1 to 4 as follows: 1 = not satisfied; 2 = less satisfied; 2.5 = barely satisfied; 3 = satisfied; 4 = very satisfied. Column 4 consists of the multiplication of the weight of column 2 with the rate of column 3; and the sum of the total weighted scores for each internal and external factor. In a SWOT analysis, the quadrant positions can be determined by subtracting the total number of factors S with W(d) and factors O with T(e): A number obtained (d = x) becomes a value or point on the X axis, whereas a number obtained (e = y) becomes a value or point on the Y axis.

RESULTS AND DISCUSSION

Overview of NFP Muara Angke

The Muara Angke Fishing Port is located in the Administrative City of North Jakarta at 6°6′21″ South Latitude and 106°46′29.8″ East Longitude. Muara Angke is administratively located in Pluit Village, Penjaringan District, North Jakarta Municipality. Muara Angke's land area is currently 73 hectares. The Kali Angke Delta and the Mangrove Plant Zone are part of the Muara Angke Fishing Port. The current difference between the land surface and sea level in the Muara Angke area is about one meter, and the soil is soft.

Muara Angke Nusantara Fishing Port was inaugurated on dated July 7, 1977 by Governor Ali Sadikin which was originally a Fish Landing Base. Located in the Muara Angke Delta, administratively it belongs to the Pejaringan sub-district, North Jakarta. Based on the Decree of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia number 13/KEPMEN-KP/2017 concerning the Designation of the Muara Angke Fishery Port as the Muara Angke Archipelago Fishery Port in North Jakarta City. Currently, the Muara Angke area is one of the fishing industrycenters in Jakarta and supplies fish to both local and export markets. As a Nusantara Fishing Port, Muara Angke Fishing Port can accommodate fishing vessels over 100 GT in size.

The majority of the business actors of Muara Angke are involved in the fisheries sector, such as fish traders, fishermen, and so on. As a result, there are many fisheries-related businesses in Muara Angke, such as fishing, ship repair, and processing units. The catch at PPN Muara Angke is dominated by high-value species such as squid, mackerel, snapper, shrimp, and black pomfret.

Layout and facilities of the Muara Angke Nusantara Fishing Port

Figure 1 shows the flow at the Muara Angke Nusantara Fishing Port. Fishing vessels enter the port pool and activity line up to land their catch; this process begins at 7 a.m. and continues until the process is completed. The

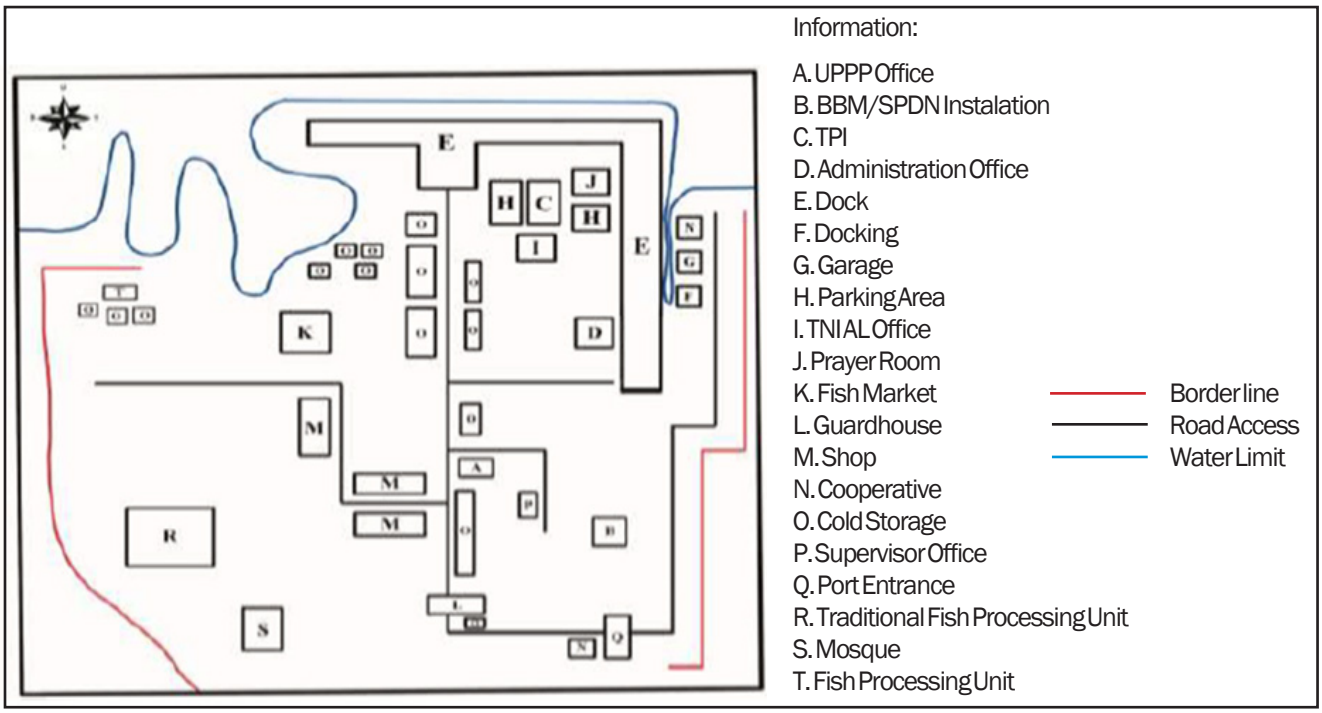

Figure 1. Layout Muara Angke NFP.

catch will be sent to cold storage, particularly for export commodities like squid. Squid products will be exported to foreign markets such as China, Vietnam, Thailand, and Taiwan after processing. If the catch does not meet export requirements, it will be sold to local and wholesale markets. Apart from squid, other fish will be distributed to the Fish Auction Place and will be sold through an auction process. The auction begins at 10 a.m. and continues until the fish are sold out. The auction will begin with the lowest price and progress to the highest price, with the buyer who offers the highest price winning the auction.

Fisheries Activities on the Muara Angke NFP

The total production and value of fish at the Muara Angke Nusantara Fishing Port are presented in Table 3.

Table 3. Muara Angke NFP production and production value.

No.	Year	Amount of Production	Production Value
1.	2017	41.586.164	1.483.750.339.055
2.	2018	36.585.550	1.533.008.547.935
3.	2019	35.329.283	1.314.691.792.875
4.	2020	36.899.171	1.323.925.092.825
5.	2021	39.827.328	1.627.204.005.350

Source: NFP Muara Angke, 2022.

Table 3 shows how the value of capture fisheries production fluctuated from 2017 to 2021. Several factors influence these fluctuations, including (1) differences in the types of fish landed that year, (2) seasonal price fluctuations, and (3) market prices that affect the production value of fishery products. Prices tend to fall as the catch increases. As a result, even though the amount of production is large, the total value of production decreases. Table 4 shows the number of visits to the Muara Angke Fishing Port by fishermen.

Table 4. Number of visiting fishing vessels.

Fishing Vessels Size (GT)	Year			
	2018	2019	2020	2021
≤30	792	1.413	1.092	1.115
>30	747	138	775	786
Total	1.539	1.551	1.867	1.901

Source: NFP Muara Angke, 2022.

These fluctuations in fishing vessel visits can be influenced by a variety of factors, including the fishing season. The number of fishing vessels in operation is affected by the fishing season. For example, bad weather prevents fishermen from venturing out to sea.

Analysis of basic facility condition

Fishing ports have main functions such as fishing boat moorings, and loading and unloading activities of catches. An operation of a fishing port will be carried out if the basic facilities are adequate. Apart from the availability of these facilities, fishing ports must consider the feasibility of their use. The feasibility of a facility determines how well it is used by users. Piers, Harbor Pools, Shipping Channels, Breakwaters, Jetties, Drainage, Groins, Revertments, Bollards, and Bridges are the main facilities described by Lubis *et al*. (2012). Table 5 shows the main facilities of the Muara Angke Fishing Port.

Table 5. Basic facilities condition.

No.	Facilities	Wide	Unit	Description	Point
1.	Land area	72	Ha	very proper	2.5
2.	Breakwater	470	m	very proper	2.4
3.	Pool	63.993	m^2	proper	2.3
4.	Revetment	1.000	m	proper	2.2
5.	Fender	100	unit	proper	2.3
6.	Bollard	122	unit	proper	2.3
7.	Bridge	1	unit	very proper	2.6
8.	Road and Drainage	4.940	m	proper	2.3
9.	Pier	530	m	very proper	2.6

Source: NFP Muara Angke, 2022.

The results showed that the total points for basic facility conditions were 21.5. After calculating with the analysis formula, the fishery port condition score was 2.4. This score indicates that the basic facilities of the Muara Angke Nusantara Fishing Port were very feasible.

Functional facilities condition analysis

The functional facilities include port administration offices, TPI, clean water supply, electrical installations, and other facilities that are directly used for the benefit of managing fishing ports or can be managed by individuals or legal entities. According to Murdiyanto (2003), functional facilities include a variety of facilities to meet a variety of other needs in the port area, including navigation assistance, transportation services, fuel demand supply services, fish handling and processing facilities, net repair facilities, ship repair and repair, and service needs. Clean water and marine supplies, WWTP, communication services, and social welfare services for fishermen and the general public are all available. Table 6 shows the functional facilities of the Muara Angke Fishery Port.

The results showed that the total points for basic facility conditions were 51.0. After being calculated by the analysis formula, the functional condition score of the fishing port was 2.5. This score indicated that the functional facilities of the Muara Angke Nusantara Fishing Port were good.

Analysis of supporting facility conditions

Supporting facilities are those that are only used to help an institution. Supporting facilities enhance the port's role by providing convenience in carrying out activities at the port. According to Alfiana *et al*. (2018), supporting facilities indirectly increase the role of fishing ports by providing convenience for port activities. Worship facilities, guardrails, mess operators, official houses, and shops or stalls are examples of supporting facilities. Table 7 shows the supporting facilities at the Muara Angke Fishing Port.

After being calculated by the analysis formula, the score for supporting conditions for fishing ports was 2.5. This score indicated that the supporting facilities for the Muara Angke Nusantara Fishing Port were adequate.

Table 6. Functional facilities.

Facilities	Wide	Unit	Description	Point
Auction hallTPI	2.212	m^2	very proper	2.6
Fish market	3	Ha	very proper	2.6
PHPT	5	Ha	very proper	2.6
Beacon Lights	2	Unit	very proper	2.4
Docking	4	Unit	very proper	2.6
Slipway	20	Unit	very proper	2.6
Workshop	3	Unit	very proper	2.4
Fish Processing Unit	34	Unit	very proper	2.7
Cold Storage	44	Unit	very proper	2.6
Fishery Products Quality Development and Testing Laboratory	1	Unit	very proper	2.6
Post Administration Office	1	Unit	very proper	2.7
Fishery Administration Office	1	Unit	very proper	2.6
Forklift and Heavy Equipment	3	Unit	very proper	2.4
Parking lot	2	Unit	very proper	2.5
Waste Treatment Plant	1	Unit	very proper	2.5
Garbage dump	1	Unit	very proper	2.4
BBM/SPDN Installation	3	Unit	very proper	2.6
Electrical Installation	53.000	Watt	very proper	2.6
Generator	250	kVa	very proper	2.6
Water Installation	6.000	Liter	very proper	2.4

Source: NFP Muara Angke, 2022.

Table 7. Supporting facilities.

No.	Facilities	Wide	Unit	Description	Point
1.	Guard House	4	Unit	very proper	2.5
2.	Prayer Room	3	Unit	very proper	2.5
3.	Health Clinic	2.260	m^3	very proper	2.5
4.	MCK	3	Unit	proper	2.3
5.	Shop	65	Unit	very proper	2.5
6.	Cooperative	2	Unit	very proper	2.5
7.	TNI AL Station	1	Unit	very proper	2.5
8.	Port Entrance Gate	1	Unit	very proper	2.7

The total value of fishing port facilities

After calculating the condition of the fishing port using the analysis formula, a score of 2.4 was obtained for the main facilities, indicating that the Muara Angke Archipelago Fishing Port's main facilities were in good condition. The functional facilities rating was 2.5, indicating that the Muara Angke Nusantara Fishery Port's functional facilities were in good condition. Supporting facilities of 2.5 indicate that the Muara Angke Archipelago Fishing Port's supporting facilities are in good condition.

In summary, the score for the facilities at the Muara Angke Nusantara Fishing Port was 2.5 which indicated that the facilities at the Muara Angke Nusantara Fishing Port were feasible.

Level of Utilization of NFP Muara Angke Facilities

Harbor pond area

$$L = lt + (3 \times n \times l \times b) = (\pi.r2) + (3 \times n \times l \times b)$$
$$= (3.14 \times 202) + (3 \times 20 \times 20 \times 6)$$
$$= 1.256 + 7.200$$
$$= 8.456\ m^2$$

$$\text{Utilization Rate} = \frac{\text{Use of facilities}}{\text{facility capacity}} \times 100\%$$
$$= \frac{8.456}{63.993} \times 100\%$$
$$= 13.21\%$$

Based on research, the area of the ponds used at the Muara Angke Nusantara Fishing Port was 8.456 m^2. According to the Muara Angke Archipelago Fishing Port's 2021 annual report, the Muara Angke harbor pond has a surface area of 63.993 m^2. Based on the calculation of the port pool area utilization rate, namely the port pool area at the Muara Angke Archipelago Fishery Port of

Fisheries Port Score = (0.50 x basic facilities) + (0.33 x functional facilities) + (0.17 x supporting facilities).
$= (0.50 \times 2.4) + (0.33 \times 2.5) + (0.17 \times 2.5)$
$= 1.2 + 0.83 + 0.43$
$= 2.5$

13.21%. The level of utilization in the port pool area revealed that conditions were still suboptimal.

Harbor pond depth

$$D = d + \tfrac{1}{2}H + S + C$$
$$= 2 + 0.15 + 0.2 + 0.3$$
$$= 2.65 \text{ m}$$

$$\text{Utilization Rate} = \frac{\text{Use of facilities}}{\text{facility capacity}} \times 100\%$$

$$= \frac{2.65}{4} \times 100\%$$
$$= 66.25\%$$

The harbor pond at Muara Angke Fishery Port was estimated to be 2.65 m deep. The depth of the Muara Angke Archipelago Fishing Port pond was 4 m, according to the annual report for 2021. The depth of the port pool was 66.25% based on the results of calculating the utilization rate. The depth of the harbor pool was still not being used to its full potential. The depth of the Muara Angke Fishing Port pond was previously 6 m; however, due to sedimentation around the port pond, the current port pond depth is 4 m.

Fish auction building area

$$S = \frac{n \times p}{r \times a}$$

$$= \frac{92 \times 200}{0.4 \times 1}$$
$$= 46.000 \text{ m}^2$$

$$\text{Utilization Rate} = \frac{\text{Use of facilities}}{\text{facility capacity}} \times 100\%$$

$$= \frac{46.000}{2.212} \times 100\%$$
$$= 20.8\%$$

According to the findings of the research, the TPI building area at the Muara Angke Nusantara Fishery Port was 46.000 m^2. According to the Muara Angke Nusantara Fishing Port annual report for 2021, the Muara Angke Nusantara Fishing Port TPI has a building area of 2.212 m^2. According to the findings, the TPI building at the Nusantara Fishery Port of Muara Angke was used 20.8% of the time. The TPI building area was still not being used to its full potential. The inefficient use of the TPI building was because the auction at the Muara Angke Nusantara Fisheries Port only runs once, from 10.00 WIB until it is completed.

$$L = \frac{(l + s)\, n \times a \times h}{u \times d}$$

$$= \frac{(20 + 2) \times 20 \times 120 \times 840}{92 \times 5.580}$$

$$= \frac{44.352.00}{513.360}$$

$$= 86.39 \text{ m}^2$$

$$\text{Utilization Rate} = \frac{\text{Use of facilities}}{\text{facility capacity}} \times 100\%$$

$$= \frac{86.39}{530} \times 100\%$$
$$= 16.30\%$$

The length of the wharf at the Muara Angke Nusantara Fishery Port was estimated to be 86.39 m. The pier's length was 530 m, according to the 2021 Muara Angke Archipelago Fishing Port annual report. According to the utilization rate calculation, the length of the wharf at the Muara Angke Fishing Port was 16.30%. This means that the length of the wharf was not being used to its full potential.

Muara angke NFP development strategy

Calculation of internal and external factor scores

There are two factors to formulate a development strategy, namely internal factors which are strengths and weaknesses, and external factors that is opportunities and threats. The analysis used is internal factor analysis or often called the Internal Strategic Factor Analysis Summary (IFAS) and external factors or often called the External Strategic Factor Analysis Summary (EFAS). SWOT analysis uses methods to maximize strengths and opportunities and minimize weaknesses and threats. According to Fuadi (2020), the formulation of the SWOT strategy goes through several steps such as creating an internal-external matrix resulting from mapping the SWOT Framework, calculating the weight of each factor, calculating ratings and scores on each factor, factors in the column, giving the weight of each factor, calculating the rating for each factor ranging from 4 (strongly agree) to 1 (Strongly disagree) based on the influence of these factors on the condition of the organization, multiplying the weight by the rating to get a score for each factor, and summing the weighting scores to get the total score for each topic. Identification of internal factors and external factors at the Muara Angke Fishing Port for a development strategy based on direct observation and interviews with related parties.

After identifying the factors in the Muara Angke Islands Fishing Port development strategy, internal and external factors were scored using weights and rating values. The weight rating determined the level of importance of the factors for the development of the Muara Angke Fishing Port, while the rating assessment determined the strength of the factors influencing the development of the Muara Angke Fishing Port, and it would be determined in which quadrant was the strategy for the development of the Nusantara Muara Angke Fishing Port. Abidin *et al*. (2015) calculate scoring and weighting to generate a development strategy position diagram. Following the identification of internal and external factors, they were linked in a matrix to generate several alternative matrix strategies. Table 8 displays the SWOT analysis scoring for internal and external factors.

Based on Table 8, it can be seen that the internal factors in the development strategy of Nusantara Muara Angke Fishing Port had a total weight value of 1 with a strong weight value of 0.50 and a weak weight value of 0.50.

Table 8. Scoring of internal factors and external factors.

Code	Explanation	Value		
	Strengths	Weight	Rating	Score
S1	The condition of the facilities at the Muara Angke NFP is quite good	0.10	3.22	0.31
S2	The strategic location of Muara Angke NFP	0.12	3.37	0.40
S3	Many ships visiting Muara Angke PPN	0.09	3.25	0.30
S4	Easy licensing service	0.09	3.38	0.31
S5	Maintained environmental cleanliness	0.10	3.17	0.33
Total (S)		0.50	16.39	1.64
Code	Explanation	Value		
	Weakness	Weight	Rating	Score
W1	Inadequate boat mooring facilities	0.08	2.95	0.24
W2	Fishery port land area to improve port facilities	0.09	3.3	0.28
W3	Lack of human resources and developing technical capabilities to improve the operational quality of Fishing Ports.	0.19	3.17	0.61
W4	Lack of port pool maintenance	0.07	3.05	0.23
W5	Many facilities are no longer functioning	0.06	2.52	0.16
Total (W)		0.50	14.99	1.53
Total Internal Factors		1.00	31.38	3.17
Total Score Strength-Weakness				0.12
Code	Oportunity	Weight	Rating	Score
O1	Muara Angke NFP locations include Minapolitan area.	0.11	3.24	0.35
O2	The potential for fish marketing outside of Muara Angke NFP is huge	0.12	3.20	0.38
O3	The number of fishermen and fishing communities is large enough to allow the growth of a large fishery activity center	0.12	3.27	0.39
O4	Many private fishing factories in the Muara Angke NFP environment	0.11	3.05	0.33
O5	The development of fish culinary centers in Jakarta	0.12	3.29	0.41
Total (O)		0.58	16.05	1.45
Code	Threats	Weight	Rating	Score
T1	Reduced fleet entering Muara Angke NFP	0.07	2.53	0.17
T2	Tidal floods that disrupt fishing activities at Muara Angke PPN	0.10	3.14	0.30
T3	The decline in the catch of fishermen from Muara Angke NFP is influenced by the season	0.08	2.80	0.22
T4	The decline in fishery activities in Muara Angke PPN due to inadequate facilities	0.08	2.78	0.22
T5	High risk of natural disasters (tidal & low tide)	0.10	2.65	0.27
Total (T)		0.42	13.90	0.91
Total External Factors		1.00	29.95	2.36
Total Score Opportunity-Threats				0.54

Source: Research, 2022.

The total rating value on internal factors was 31.38 with a strength rating value of 16.39 and a weakness rating value of 14.99. The total score on internal factors was 3.17 with a strength score of 1.64 and a weakness score of 1.53. Furthermore, the value of the strength score was reduced by the value of the weakness score which was equal to 0.12 which was the X axis in the SWOT quadrant. External factors had a total weight value of one, with an opportunity weight value of one and a threat weight value of one. External factors received a total rating value of 29.95, with an opportunity rating value of 16.05 and a threat rating value of 13.90. The total score on external factors was 2.36 with an opportunity score of 1.45 and a threat score of 0.91. The Y axis in the SWOT quadrant was calculated by subtracting the opportunity score from the threat score, which was 0.54.

SWOT matrix analysis

The result of calculating the internal factor score determines the X axis while the result of calculating the external factor score determines the Y axis. This SWOT matrix can produce four possible sets of alternative

strategies, namely strategy (S-O), strategy (S-T), strategy (W-O), and strategy (W-T).

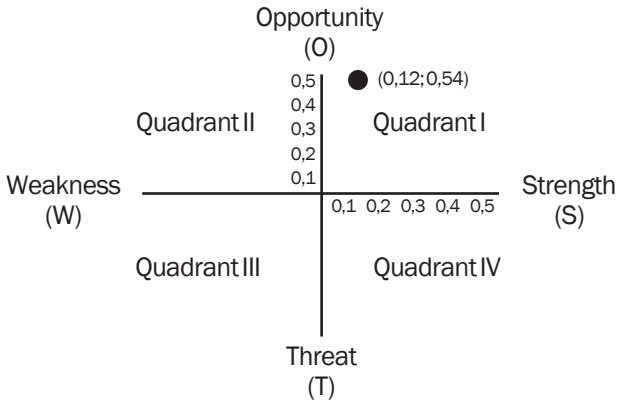

Figure 2. SWOT quadrant of Muara Angke Fishery Port development strategy.
Source: Research, 2022.

The results showed that the development strategy is in quadrant I with the X-axis (0.12) and Y-axis (0.54). According to Luntungan & Tawas (2019), quadrant 1 can be described as a very good situation because there are strengths that can be exploited to get opportunities. Therefore, alternative strategy 1 can be used, namely the development strategy (aggressive strategy). That is, this position is a profitable business situation.

Strategy priority determination

SO-2: Developing and improving industrial centers for fishing fishery products. One of the priority strategies for the development of the Muara Angke Nusantara Fishery Port is the development and improvement of the fishery product processing industry center because the Fishery Port is located in a strategic area with easy access to fishery product resources. The catch can be used to make processed fishery products like steaming, smoking, or other products. This condition creates job opportunities and business opportunities for the processing industry center industry.

ST-1: Doing community service to prevent tidal floods which can disrupt fishing activities. Tidal flooding at the port is caused by silting of harbor ponds, which can disrupt fishing activities. For tidal flood mitigation, the depth of the port pool must be monitored. As a result, a strategy for avoiding silting of harbor pools through community service is required.

WO-2: Improving capacity building to improve the quality of operational services. One strategy for developing Archipelago Fishing Ports is to increase capacity through training in fishing port management. This must be adjusted to the opportunities, strengths, and weaknesses in the NFP Muara Angke, which has a high potential for fish resources, and simple operational services, and some of he existing facilities are deemed to be underutilized by respondents.

SO-1: Completing and improving the function of port facilities. The Muara Angke Nusantara Fishing Port has quite complete facilities in reasonably good condition. Muara Angke Nusantara Fishing Port Facilities account for 81.81% of the 22 categories of facilities identified, namely 18 categories of facilities. Several facilities must be rehabilitated to increase their use value. Harbor ponds, drainage, toilets, and other facilities are among those that need to be rehabilitated or repaired. Port managers can use utilization level analysis to make future port development decisions based on port quality.

SO-3 Simplification of the permit process to tow fishing vessels ashore at the Muara Angke Fishery Port. The simplification of the licensing process will encourage fishing vessels to dock at the Muara Angke Fishery Port. The evaluation of port utilization management leads to space optimization at the port and the effectiveness of fishing vessels entering and leaving.

CONCLUSION AND RECOMMENDATION

Conclusion

Fishing ports play an important role in facilitating fishing business activities and supporting fish resource management. The completion of fishing port facilities will aid in the continuation of fishing business activities. As a result, it is critical to assess the Muara Angke Nusantara Fishing Port facilities. The purpose of this research was to examine the facilities at the Muara Angke Nusantara Fishing Port to improve their performance and thus contribute to the activities and fishing industry in Jakarta. The facility score was 2.5, indicating that the facilities at the Nusantara Fisheries Port were good, but the level of utilization was low because the length of the pier, area of the ponds, depth of the harbor pool, and level of utilization of the fish auction site were all underutilized. The SWOT analysis revealed that the X:Y results were 0.12 and 0.54, respectively, and were located in quadrant I or the S-O (Strength-Opportunity) strategy. As a result, to increase the facility utilization rate score, the Muara Angke Archipelago Fishery Port (PPN) must improve services and attract investors.

Recommendation

Based on the conclusions that have been obtained, the suggestions are as follows: 1). It is suggested that the Muara Angke Nusantara Fishery Port follow the current development strategy; 2). To improve port quality in the future, the Muara Angke Nusantara Fishing Port must optimize existing facilities, and 3). To increase the facility utilization rate score, the Muara Angke Nusantara Fishing Port should improve its services and attract investors.

ACKNOWLEDGEMENT

I would like to thank the NFP Muara Angke staff and all parties who helped collect data for this research, as well as the reviewers who provided suggestions and input so that this manuscript could be published.

AUTHORS' CONTRIBUTIONS

The final manuscript was written by all of the authors. The following are each author's contributions: (1) KN is responsible for develop the main conceptual ideas, visualize them, validate them, write reviews, and edit them. (2) AS is responsible for conceptualization, writing review and editing, visualization, and supervision, while (3) ADPF is responsible for the supervision, visualization, validation, review writing, and editing.

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How to cite this article Nurazizah, K., A. Suherman & A.D.P. Fitri. 2023. Evaluation of the performance improvement of the Muara Angke Nusantara Fishing Port (NFP) Jakarta. Jurnal Perikanan Universitas Gadjah Mada. 25 (1): 67-76. DOI https://doi.org/10.22146/jfs.79115