South East Asian Marine Sciences Journal (SEAMAS)
Journal Homepage : https://journal.stedca.com/index.php/seamas

The service of Bungus Ocean Fishery Port to support tuna industries

Resti Zainal[1*], Nofrizal[1], Isnaniah[1]
[1]Department of Utilization of Fisheries Resources, Faculty of Fisheries and Marine, Universitas Riau, Pekanbaru 28293 Indonesia
Corresponding Author: resti.zainal3735@student.unri.ac.id

Article Info
Keywords:
Bungus,
Fishing port services,
IPA and CSI,
Stakeholder satisfaction,
Tuna industry.

Received:
23 August 2023
Accepted:
18 September 2023
Published:
30 September 2023

Abstract
The services of the Bungus Ocean Fishery Port, as the only tuna Fishery port in West Sumatra, support the availability of facilities required by each tuna industry stakeholder. The purpose of this study is to determine the services from the Bungus Ocean Fishery Port that fisheries stakeholders, especially tuna, are currently experiencing: and to determine the level of satisfaction of tuna entrepreneurs with the performance of the Bungus Ocean Fishery Port. The data analysis used is weighting or scoring, and then IPA and CSI analysis is carried out. The results showed that the Bungus Ocean Fishery Port played a good role in providing production activity, infrastructure and public services, and stakeholder's tuna feel they are quite satisfied with the performance of the Bungus Ocean Fishery Port in supporting the tuna industry and several service attributes of the Bungus Ocean Fisheries port still need to be improved.

1. INTRODUCTION

Fishing ports are centers of fishing activities equipped with various facilities that support all fishing activities and services available to port users (Zain et al., 2010). In essence, fishing ports are the main business activities of the capture fisheries industry. One of the fishing industries in fishing ports that plays a very important role in a region's economy is the tuna fishing industry. The tuna fishing industry is an industry that has quite important value for the regional industrial economy because tuna is a fish commodity. After all, it has a high selling value and production volume (Hutapea et al., 2017). Besides having important economic value, tuna is also one of Indonesia's export commodities. PPS Bungus statistical data of 44,522 tonnes of export volume for fresh tuna production, 381,068 tonnes for processed tuna production and 61,083 tonnes of fresh tuna production volume for the region. Local fisheries landed at the Bungus Ocean Fisheries Port (PPS) (DJPT 2018).

Bungus Ocean Fishing Port (PPS) is a type A (ocean) fishing port and the only PPS on West Sumatra Island that carries out direct exports of tuna commodities. Bungus PPS services are necessary for supporting the tuna fishing industry because the port is the center of tuna industry activity, good support from the port will also make a good contribution, especially in the fishing industry. Based on this, research needs to be carried out to analyze what kinds of services are provided by PPS Bungus in supporting the tuna fishing industry. These services are hoped to meet stakeholder needs and support tuna industry activities. This research aims to determine the service assessment of the Bungus Ocean Fishing Port as perceived by tuna fisheries stakeholders and determine the level of satisfaction of tuna entrepreneurs with the performance of the Bungus PPS.

2. RESEARCH METHODS

Time and Place

This research was conducted in June 2022 at the Samudera Bungus Fishing Port, West Sumatra, Indonesia. This research location is the only tuna centre on the West coast of Sumatra.

Research method

The research method used is a survey method. Surveys collect various types of information regarding facts and opinions from various sources such as institutional records, censuses, economic and demographic data reports, tests, case studies and questionnaires (Muljono, 2012). Data was collected using questionnaires, direct observation and interviews at the port. Sampling used purposive sampling, namely five respondents, including one person from the tuna processing industry, two people from the fresh tuna industry and two people from the PPS Bungus management.

Questionnaire data were processed using Microsoft Office Excel (2013). The result data is tabulated first to facilitate the analysis process. The collected PPS Bungus service assessment data is tabulated based on production activities, infrastructure and public services and then analyzed using the scoring method. The second questionnaire data was tabulated based on the level of interest of tuna stakeholders and the level of performance of PPS Bungus, which was then analyzed using the Importance Performance Analysis (PA) and CSI methods.

The data analysis used in the research is an analysis of port services and analysis of the level of interest of tuna stakeholders and the performance of PPS Bungus.

Research Procedures

Port Service Analysis

Port service analysis is carried out using a weighting method or scoring method. Data analysis was conducted by researching several parameters and sub-parameter assessments related to production activities, infrastructure and public services at fishing ports. The assessment stages are as follows: 1) Determining parameters and subparameters, 2) each parameter and sub-parameter is given a weight, scale and value according to the level of interest of tuna stakeholders. The parameters discussed are production activities, facilities infrastructure and public services. 5 sub-parameters are developed for each parameter, 3) determination of scale and weight, 4) the weight is determined based on the quality (level of importance) assessed by the respondent, with a total weight of 1.00. The scale given to each subparameter uses a Likert scale with a value range of 1-5 (not good, not good, quite good, good and very good).Assessment of parameters, 6) the assessment of the parameters of production activities, infrastructure and public services is done by multiplying the weight and scale of each sub-parameter given by the respondent, and 7) determination of assessment results

The assessment result is the final value from the total value of each sub-parameter. The results of service assessment using a Likert scale are divided into five categories, namely: 1) Very Good if total score = 4.2 - 5.0; 2) Good if total value = 3.4 - < 4.2; 3) Fairly Good if total score = 2.6- <3.4; 4) Not good if total score = 1.8-< 2.6; 5) Not Good, if total value = 1.0 - < 1.8.

Analysis of Tuna Stakeholder Satisfaction Levels and PPS Bungus Performance

Analysis of the level of importance and performance using IPA analysis. The stages carried out are: 1) Attribute assessment based on four dimensions: facilities, permits, availability of raw materials and services, which were then developed into 20 assessment attributes, 2) determining importance and performance values using a likert scale, 3) calculate the average level of performance and importance of all attributes, 4) making a Cartesian diagram to assess all dimensions of service company performance based on customer expectations (Handajani and Yanto, 2015). Determination of the centre line uses the average value of the overall attribute as a dividing line on the X-axis (performance) and Y-axis (importance), and 5)Explanation of each quadrant

Stages of CSI analysis (Supranto 2006 *in* Nasir et al. 2012):

$$\textit{Weighting Factors}\ (WF) = \frac{RSP}{\sum RSP} \times 100\% \cdots\cdots\cdots\cdots (1)$$

Information:

WF : *Weighting Factors*
∑RSP : Total importance level scores
RSP : Average importance score

$$\textit{Weighted Score}\ (WS) = RSK \times WF \ldots\ldots\ldots\ldots (2)$$

Information:

WS : *Weighted Score*
RSK : Performance level value
WF : *Weighted Factors*

$$\textit{Customer Satisfaction Index}\ (CSI) = \frac{WMT}{L} \times 100\% \ldots\ldots\ldots\ldots (3)$$

Information:

CSI : Customer Satisfaction Index
WMT : *Weight Median Total*
L : Maximum scale

Satisfaction of respondents with the following criteria: a) $x < 35\%$ → dissatisfied; b) $35\% \leq x \leq 50\%$ → less satisfied; c) $51\% \leq x \leq 65\%$ → quite satisfied; d) $66\% \leq x \leq 80\%$ → satisfied; e) $81\% \leq x \leq 100\%$ → very satisfied

3. RESULTS AND DISCUSSION

PPS Bungus Service Assessment

The respondent's assessment of the production activity parameters was 3.87, meaning that production activity services played a good role. The production activity parameters consist of 5 sub-parameters, the highest values, namely data collection on the production of catches that are landed or entered into the industry. The lowest values the quality and quality of the catches that are landed and supporting the availability of raw materials.

Data collection on landed catches is carried out directly by port employees, and data collection on each arrival of fishing vessels with catches of the highest value. Research by Khairani et al. (2022) that the catch results published by PPS Bungus are accurate. The quality of the catch landed at the Bungus PPS is considered to be still low, confirmed by previous research conducted by Kopa (2016) that the low quality of the catch landed at the Bungus PPS is caused by fishermen's lack of concern regarding the handling of fish on board, the use of bulk ice on Fish storage hatches, and temperatures in fish storage areas are still not regular. Efforts must be made to improve the quality and quality of catches through education to fishermen.

The availability of tuna raw materials for the tuna fishing industry is considered low, related to the need for raw materials in production. One of the causes of the need for more availability of raw materials is decreased visits or landings from fishing vessels, especially tuna vessels. The decline in fishing vessel visits is because licensing for tuna vessels over 30 GT is considered difficult, as well as the spread of COVID-19. Sanitation and hygiene in ports and the tuna fishing industry have an important role in fishing activities because they affect the quality of the product that will be released. Every tuna fishing industry in PPS Bungus handles liquid waste from the production process by disposing of the waste through drainage channels so that it does not stagnate, cause unpleasant odours, and contaminate tuna products or raw materials.

The respondent's assessment of the infrastructure parameters is 3.60, meaning that production activity services play a good role. Infrastructure parameters consist of 5 sub parameters. The highest

assessment is in the sub-parameter of providing a mooring place for tuna boats, and the lowest value is providing a place for tuna processing activities.

Table 1. Tuna industry service assessment parameters

	Parameter	Bobot (B)	Scale (S)	Evaluation PPS Bungus (B x S)
A	Production Activities			
1.	Sanitation and hygiene in ports and the tuna fishing industry	0,21	4	0,84
2.	The quality and quality of the catch landed	0,20	3,8	0,76
3.	Data collection on the production of catches that are landed or entered into the industry	0,22	4,2	0,92
4.	Supporting the availability of tuna raw materials	0,16	3,2	0,51
5.	Maintain the quality and quality of the products issued	0,21	4	0,84
	Total	1,00		3,87
B	Infrastructure			
1.	Provision of mooring places for tuna boats	0,27	4,6	1,24
2.	Provision of places for loading and unloading tuna fish	0,24	4	0,96
3.	Providing a place for tuna processing activities	0,14	2,4	0,34
4.	Provision of marketing and distribution facilities for fishery products (to markets, industry, refrigerated vehicles)	0,15	2,6	0,39
5.	Provision of final disposal sites	0,20	3,4	0,68
	Total	1,00		3,61
C	Public Service			
1.	Tuna boat mooring services	0,19	2,6	0,49
2.	Price and market information services	0,10	1,4	0,14
3.	Ease of licensing tuna boats	0,16	2,2	0,35
4.	Easy access to and from the tuna industry area	0,26	3,6	0,94
5.	Providing *cold storage,* clean water and electricity supply for the tuna fishing industry	0,29	4	1,16
	Total	1,00		3,08
	Overall average value			3,52

Providing a mooring place for tuna boats is of the highest value. It provides much convenience both in filling supplies, repairing ship engines and fishing equipment as well as for fishermen to rest before going to sea, mooring facilities, namely: dock and harbor pool with a length of 3,730 m2 with a capacity of 100 boats and a harbour pool covering an area of 7.2 Ha. The port pool allows ships to turn around and unload catches (Hasan et al., 2022).

The provision of a place for tuna processing activities is the lowest value because the facilities at the fish processing place are not functioning, and some of the equipment is rusty, so it cannot be used for fish processing. Fish landed at PPS Bungus are immediately taken by the company to the factory to be processed using final results such as meatballs, nuggets, etc.

Respondents' assessment of general service parameters was 3.60 (Table 2), meaning that production activity services played a good role. Infrastructure parameters consist of 5 sub-parameters, which are the highest values in the general service sub-parameters, namely the provision of cold storage, clean water, and electricity supply for the tuna fishing industry, while the lowest values are in the sub-parameters of ease of tuna boat licensing and price and market information services.

PPS Bungus services in providing cold storage, clean water, and electricity supply for the tuna fishing industry were considered good by respondents. However, it provides cold storage, clean water, and electricity supply not only for the tuna industry but for all parties who need these facilities in the port

area. Cold storage has a capacity of 100 tons, consisting of 3 ABF freezing rooms with a temperature of -40°C and one CS frozen warehouse room with a temperature of -20°C (Table 2).

Table 2. Results of respondents' assessments of performance level values $(\bar{X})$ and importance level values $(\bar{Y})$

No.	Attribute	Performance (x)	Importance (y)
	Fasilitas		
1	Availability of basic facilities	3.33	4.63
2	Availability of Functional Facilities	2.67	4.33
3	Availability of Supporting Facilities	2.67	3.33
4	Ease of utilizing basic facilities	2.33	3.67
5	Ease of utilizing functional facilities	2.67	4.67
6	Ease of utilizing supporting facilities	2.67	3.67
7	Facility Conditions	3.00	4.63
	Licensing		
8	Ease of licensing tuna boats	1.67	4.33
9	Licensing time (speed of processing)	1.67	4.33
	Availability of Raw Materials		
10	Sufficiency of raw materials	2.00	5.00
11	Quality of raw materials	3.00	4.33
12	Continuity of raw materials	3.00	4.33
13	Smooth running of raw materials	2.33	4.67
	Service		
14	Unloading and loading	2.00	3.67
15	Packing and transportation	2.33	3.33
16	Supplies	2.67	4.33
17	Safety & Cleanliness	2.67	4.33
18	Service quality	3.00	4.67
19	Clear procedures	3.00	3.00
20	Officer alertness	3.33	4.67
		2.60	4.20

Easy access to and from the tuna industrial area at PPS Bungus in the form of good road access because every company needs good road access for the smooth distribution and delivery process of raw materials or tuna fishery products. Services at PPS Bungus are considered low because tuna information and tuna prices are based on agreements between fish owners and potential buyers. Information services are very important at fishing ports because they can be used as promotional events to attract investors in the maritime and fisheries sector (Puspitasari et al., 2013).

Tuna stakeholder satisfaction level

The assessment of the level of interest of tuna *stakeholders* and the level of performance of PPS Bungus is in Table 2. Determining the position of each attribute in the Cartesian diagram by calculating the location of the boundary of two lines that intersect perpendicularly at ($\bar{X}, \bar{Y}$) the center line of the axis ($\bar{X}$) is 2.60 and the axis ($\bar{Y}$) is 4.20 which is the average value of performance level and level of importance. Attribute positions in the Cartesian diagram in Figure 2. Attributes that are in quadrant I mean that these attributes have a performance level below average but the level of importance is quite high. There are four services attributes in quadrant I, namely ease of licensing tuna boats; length of permit; sufficiency of raw materials and smooth running of raw materials. Respondents assessed that these 4 attributes still need to be improved by making continuous improvements.

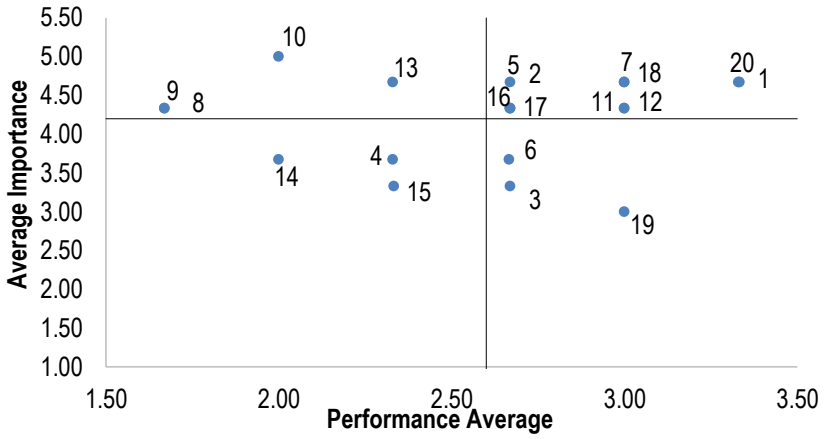

Figure 1. Cartesian importance performance analysis diagram

Based on the respondents' assessment, there are ten attributes located in quadrant II, namely the availability of basic facilities; availability of functional facilities; ease of utilizing functional facilities; condition of facilities; quality of raw materials; continuity of raw materials; supplies; safety and cleanliness; quality of service and alertness of officers. is an important attribute and the performance of the port has been The port is obliged to ensure that the performance of the institution can continue to maintain the achievements that have been achieved.

Attributes in quadrant III have a low level of actual performance as well as a lack of connection with consumers so that ports do not need to prioritize or pay more attention to these factors. There are three attributes in quadrant III, namely ease of utilizing basic facilities, loading and unloading, packing and transportation.

Attributes in quadrant IV (availability of supporting facilities; ease of utilizing supporting facilities and clear procedures) have very good performance according to *stakeholders*, but have a level of importance that needs to be reconsidered because they are not really needed. Fishing ports must make various efforts so that attributes whose performance levels are below average according to tuna *stakeholders* can move to quadrant II, especially those related to services and facilities at fishing ports.

Customer Statisfaction Index (CSI)

The stakeholder CSI value obtained is 52.12% (in the range of 51%-65%). It can be said that tuna *stakeholders* are quite satisfied with the services provided by PPS Bungus. Overall, PPS Bungus has succeeded in providing services that meet stakeholder expectations. However, the port must continue to strive to improve and maintain performance so that stakeholders remain very satisfied in the future. Guswanto et al. (2012) also stated that the creation of good service is an absolute thing in fishing ports and must be strived for because service is one of the activities that determines the success of the development of fishing port development.

4. CONCLUSIONS

The Bungus Ocean Fishing Port has played a good role in providing services for production activities, infrastructure and public services. Tuna *stakeholders* are quite satisfied with the services provided by PPS Bungus. Attributes that have a high level of importance and low satisfaction must receive more attention from the port, namely ease of licensing, length of licensing, adequacy of raw materials, smooth running of raw materials, and information on marketing and distribution of tuna fish.

The Bungus Ocean Fishing Port needs to improve port services, especially those related to the tuna industry, from production activities, infrastructure, and public services, as well as improving the performance of the port, such as fulfilling raw materials, permits, and market price information in responding to complaints faced by fisheries stakeholders.

REFERENCES

[DJPT] Direktorat Jenderal Perikanan Tangkap. (2019). *Buku Statistik 2018.* Pelabuhan Perikanan Samudera Bungus. Bungus (ID): Kementrian Kelautan dan Perikanan Republik Indonesia.

Guswanto, B., Gumilar, I., Hamdani, H. (2012). Analisis Indeks Kinerja Pengelolaan dan Indeks Kepuasan Pengguna di Pelabuhan Perikanan Samudera Nizam Zachman Jakarta. *Jurnal Perikanan dan Kelautan,* 3(4):151-163

Handajani, M., Yanto, J. (2015). Tingkat Kepuasan Konsumen terhadap Pelayanan Bongkar Muat Barang pada Terminal Peti Kemas Semarang. *Jurnal Transportasi*, 15(1):21-30.

Hasan, W., Nur, I.A., Alimina, N. (2022). Utilization and Provision Level of Mangolo Fish Landing Base Facilities, Kolaka District. *Jurnal of Fishery Science and Innovation,* 6(2):122-129

Hutapea, Y.F.R., Solihin, I., Nurani, T.W. (2017). Peran Pelabuhan Perikanan Samudera Nizam Zachman dalam mendukung Industri Tuna. *Jurnal Marine Fisheries,* 8(2): 188