

## **TECHNICAL AND OPERATIONAL SUITABILITY OF BUNGUS OCEANIC FISHING PORT IN SUPPORTING MEASURED FISH CAPTURE**

### **Kesesuaian Teknis dan Operasional Pelabuhan Perikanan Samudera Bungus dalam Mendukung Penangkapan Ikan Terukur**

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#### **ABSTRACT**

This study analyzes the suitability of the technical and operational criteria of the Bungus Oceanic Fishing Port (PPS Bungus) in supporting measured fish capture. Fishing ports play a crucial role in the capture fisheries sector, providing services from fish landing to distribution and back to the sea. Based on Government Regulation Number 27 of 2021, this study evaluates the compliance of the fishing port's technical and operational criteria. The research was conducted in 2023 at PPS Bungus, West Sumatra, using a descriptive comparative method. Data were collected through observation, interviews, literature review, and documentation. The research results indicate that the port's operational criteria are not fully met, particularly in terms of fish loading and unloading activities, which only average 3-5 tons per day. Additionally, the measured fish capture policy has not been fully implemented at PPS Bungus due to the absence of post-production PNPB receipts from fishery resources. PPS Bungus needs to improve its facilities and implement the measured fish capture policy to support fisheries sustainability.

Keywords: Port Evaluation, Port Facilities, Port Management

#### **ABSTRAK**

Penelitian ini menganalisis kesesuaian kriteria teknis dan operasional Pelabuhan Perikanan Samudera (PPS) Bungus dalam mendukung penangkapan ikan terukur. Pelabuhan perikanan berperan penting dalam sektor perikanan tangkap sebagai penyedia layanan dari pendaratan ikan hingga pendistribusian dan kembali ke laut. Berdasarkan Peraturan Pemerintah Nomor 27 Tahun 2021, penelitian ini mengevaluasi kesesuaian kriteria teknis dan operasional pelabuhan perikanan. Penelitian dilakukan pada tahun 2023 di PPS Bungus, Sumatra Barat, dengan metode deskriptif komparatif. Data dikumpulkan melalui observasi, wawancara, studi literatur, dan dokumentasi. Hasil penelitian menunjukkan bahwa kriteria operasional pelabuhan tidak terpenuhi sepenuhnya, terutama dalam hal aktivitas bongkar muat ikan yang hanya mencapai rata-rata 3-5 ton per hari. Selain itu, kebijakan penangkapan ikan terukur belum sepenuhnya

diimplementasikan di PPS Bungus karena belum ada penerimaan PNBP pasca produksi dari sumberdaya perikanan. PPS Bungus perlu melakukan peningkatan fasilitas dan implementasi kebijakan penangkapan ikan terukur untuk mendukung keberlanjutan perikanan.

Kata Kunci: Evaluasi Pelabuhan, Fasilitas Pelabuhan, Manajemen Pelabuhan

## INTRODUCTION

Indonesia's fish resource potential, which reaches 37% of the world's fish species, makes it a country with very large fish reserves, including fish with high economic value such as tuna, shrimp, lobster, and various types of ornamental fish and crustaceans (Tarihoran *et al.*, 2023). The significant increase in Indonesia's catch fisheries production from 6,580,191 tons in 2016 to 7,703,639.62 tons in 2020 highlights the importance of adequate port facilities to ensure operational efficiency (Sulistijowati *et al.*, 2023). Increasing production levels requires sufficient support from port facilities to maintain operational efficiency, such as optimizing dock utilization and scheduling to increase port productivity (Saleeshya *et al.*, 2017). Fishing ports play an important role in supporting fishing activities by providing essential facilities and services for fishermen, traders, and other stakeholders in ensuring the sustainability and efficiency of fisheries operations (Nur *et al.*, 2023; Nurazizah *et al.*, 2023; Salim *et al.*, 2022; Nurlaela *et al.*, 2024). Fishing ports equipped with adequate facilities can improve operational performance and overall fisheries productivity (Handari *et al.*, 2023).

The Measured Fishing Policy aims to ensure that fishing is carried out sustainably by taking into account the regeneration capacity of fish resources (Nurlaela, 2023; Trenggono, 2023). In Government Regulation Number 27 of 2021 concerning the Implementation of the Maritime Affairs and Fisheries Sector, fishing ports are classified into four classes, namely Ocean Fishing Ports (PPS), Archipelago Fishing Ports (PPN), Coastal Fishing Ports (PPP), and Fish Landing Bases (PPI) based on certain technical and operational criteria. The Bungus Ocean Fishing Port (PPS), located on the West Coast of West Sumatra, is one of the ports that has a strategic role in supporting fisheries activities in the region. Based on the Decree of the Minister of Maritime Affairs and Fisheries Number 4 of 2023, the Bungus PPS was designated as a base port that supports the Measured Fishing policy. However, currently, the Bungus PPS is only a berth for fishing vessels measuring 12-30 gross tonnage (GT), although ideally this port is intended for fishing vessels measuring at least 60 GT (Aisyah *et al.*, 2022; Okta Hafidzah & Zain, 2022).

An optimal fishing port must be equipped with various basic, functional, and supporting facilities that support port operations and techniques. Basic facilities include docks, port pools, shipping lanes, and adequate land. Functional facilities include fish marketing facilities, fuel installations, and fishery product handling facilities. Meanwhile, supporting facilities include operator mess, fishermen's meeting hall, and other social facilities that increase comfort for port users (Suryadi & Rahman, 2023). This study aims to analyze the technical and operational criteria of PPS Bungus and examine the implementation of the Measured Fishing policy at PPS Bungus. This analysis is important to provide an overview of the suitability of PPS Bungus facilities and operations with applicable provisions and to assess the effectiveness of the policies that have been implemented. The results of this study are expected to provide scientific contributions in the form of in-depth analysis of the technical and operational criteria of fishing ports in Indonesia, as well as an assessment of the implementation of the Measured Fishing policy, which can be used as a basis for decision making for more sustainable and efficient capture fisheries management.

## METHODS

This research was conducted in 2023 at the Bungus Ocean Fishing Port (PPS Bungus), Bungus Bay, Padang City, West Sumatra. Data collection methods used include observation, interviews, library studies, and documentation. Based on 16, data collection methods include various approaches such as observation, interviews, library studies, and documentation. The research was conducted using a comparative descriptive method. Data were processed through tabulation, sorting, and processing with descriptive and comparative techniques. Data analysis was carried out through data reduction, data presentation in narrative, table, or graphic form, and data conclusion. The research instruments used included questionnaires, observation checklists, and cameras for documentation. Research procedures included preparation, data collection, data processing, data analysis, and report preparation.

## RESULT

### Technical Criteria of Bungus Ocean Fishing Port (PPS)

The fishing port is equipped with various facilities to support its functions and roles. These facilities develop along with the progress of the fishing business and the operational needs of the port. According to Suherman *et al.* (2012), fishing port facilities are divided into three categories: basic facilities, functional facilities, and supporting facilities.

### Operational Criteria of Bungus Ocean Fishing Port Harbor Master

Harbor Master is an officer who is responsible as the administrator or head of the harbor, has an office and administration to enforce regulations in the harbor to provide a sense of security related to shipping safety, security, and management of port facilities. Harbor Master in the Fishing Port guarantees the security and safety of fishing vessel operations and helps control fish resources. The implementation of the duties and functions of the Harbor Master is regulated in Law Number 45 of 2009 concerning Amendments to Law Number 31 of 2004 concerning Fisheries.

Table 1. Number of Sailing Approval Letters Issued

Year	Number of SPB
2018	2,571
2019	3,362
2020	3,817
2021	3,576
2022	2,883

The process of issuing SPB (Sailing Approval Letter) is regulated in the Regulation of the Minister of Maritime Affairs and Fisheries Number 3 of 2013 concerning Harbor Masters at Fishing Ports and the Regulation of the Minister of Transportation Number 82 of 2014 concerning Procedures for Issuing SPB.

### Frequency of Ship Visits

The frequency of ship visits affects fisheries production at the port. The greater the frequency of ship visits, the greater the fisheries production landed at the fishing port. The following is data on the frequency of ship arrivals at PPS Bungus in 2018-2022:

Table 2. Frequency of Ship Arrivals in 2018-2022 at PPS Bungus

No	Year	Number of Visits
1	2018	4,538
2	2019	6,175
3	2020	4,857
4	2021	3,294
5	2022	4,626

The number of fishing vessel visits to Bungus PPS fluctuates every year. A significant increase occurred in 2019 with 6,175 visits. Vessel visits to Bungus PPS in 2022 increased by 1,332 visits compared to the previous year, due to an increase in the catch landed.

### **Fish Production and Production Value**

Fish production is all the results of the catch calculated in the form of wet weight of the fish caught. The following is the production data and production value at the Bungus Ocean Fishing Port:

Table 3. Fish Production at PPS Bungus

Year	Production Volume (Tons)	Production Value (Rp)
2018	687,407	6,874,070,000
2019	3,721,188	37,211,880,000
2020	3,301,587	33,015,870,000
2021	2,650,532	26,505,320,000
2022	5,101,339	99,113,856,100

The volume of fish production at PPS Bungus fluctuated during 2018-2022. The highest production occurred in 2022 at 5,101,339 tons, while the lowest production was in 2018 at 687,407 tons. The highest production value also occurred in 2022 at Rp 99,113,856,100, while the lowest production value was in 2018 at Rp 6,874,070,000.

### **Fish Auction Place (TPI)**

TPI PPS Bungus functions as a place for weighing, recording, and marketing fish caught by fishermen. The average number of fish landed at TPI is 36 tons per day with various types of large and small pelagic fish such as yellowfin tuna, bigeye tuna, mekarel, skipjack tuna, mackerel, squid, mackerel, and others. TPI operations are managed by PPS Bungus with fisheries production data collection officers and online scale operators.

## **DISCUSSION**

### **Technical and Operational Performance Analysis of Bungus Ocean Fishing Port**

Bungus Ocean Fishing Port (PPS) has various facilities that support the operation of the fishing port. These facilities are divided into three main categories: basic facilities, functional facilities, and supporting facilities. The basic facilities at Bungus PPS include docks, harbor basins, shipping lanes, revetments, drainage, and harbor roads. These components are very important for ship operations and sedimentation prevention (Sugiharto *et al.*, 2024). The 300-meter-long dock is a key component in maintaining operational efficiency. The 4-hectare harbor basin with a depth of 7 to 15 meters can accommodate up to 100 fishing vessels measuring 5 to 60 Gross Tons (GT), effectively supporting the needs of ship storage and mooring (Sugiharto *et al.*, 2024). Research by (Mutmainah & Adnan, 2018) emphasizes the strategic location of Bungus Ocean Fishing Port along the Mentawai Strait, demonstrating the importance of environmental considerations in port operations.

Functional facilities at the Bungus PPS include Fish Marketing Places (TPI), navigation and communication, fuel, ice, and electricity installations, as well as ship and fishing gear maintenance places. TPI functions as a fish marketing and weighing center, which helps maintain fish price stability and improve fishermen's welfare. These functional facilities can be used for port management purposes or operated by individuals or legal entities. Supporting facilities are secondary facilities that improve port functions and provide convenience for users in carrying out activities at the fishing port. At the Bungus PPS, supporting facilities include a fishermen's meeting hall, operator's mess, fishermen's guesthouse, social and public facilities such as places of worship and toilets, shops, and guard posts. These facilities are partly managed by individuals and cooperatives with a contract or daily rental system.

To evaluate the level of technical suitability of the Bungus Ocean Fishing Port (PPS Bungus) with Government Regulation No. 27 of 2021, the following table summarizes the technical variables that must be met by a fishing port. This table includes information on existing conditions at the Bungus PPS as well as an analysis of its suitability to the established criteria.

Table 4. Compliance with Technical and Operational Criteria of PPS Bungus

No	Government Regulation Number 27 of 2021	Existing Conditions	In accordance	It is not in accordance
<b>Technical Criteria</b>				
1	Have mooring facilities for fishing vessels measuring at least 60 GT	Has mooring facilities for fishing vessels measuring 5-60 GT. PPS Bungus has a 300 m long mooring dock for loading and unloading of fish catches.	√	
2	Capable of serving fishing vessels carrying out fishing activities in Indonesian waters, the Indonesian Exclusive Economic Zone (ZEEI), and the high seas	Serving SPB permits for fishing vessels bound for Indonesian waters, namely WPP 572 (Indian Ocean). Fishing vessels departing from PPS Bungus have fishing areas in WPP 572 according to the SIUP and SIPI they have.	√	
3	The length of the pier is at least 300 m, with a pool depth of at least minus 3 m	PPS Bungus has a 300 m long pier, the area of the PPS Bungus fishing port pond is approximately 1.5 Ha with a water depth of minus 7 m to 15 m.	√	
4	Capable of accommodating at least 100 fishing vessels or a total of at least 6,000 GT	Capable of accommodating 100 fishing vessels. The port pool facility can accommodate 100 fishing vessels with ship sizes of 5-60 GT.	√	
5	Utilizing and managing land of at least 20 ha	PPS Bungus has a land area of 20 ha which has been used to provide port facilities such as	√	

		offices, docks, traji, fish markets, ice factories, roads, workshops, docking and clean water installations.	
<b>Operational Criteria</b>			
1	Some of the fish landed are intended for export	The types of fish commodities exported are Big Eye Tuna, Yellow Fin Tuna and Sword Fish (Meca)	√
2	There are activities of loading and unloading fish and marketing fishery products which on average reach 50 tons per day	The average loading and unloading activity of fish and marketing of fishery products of 2.3 tons does not meet the criteria for ocean fishing ports	√
3	There is a fish processing industry and various other supporting industries	There is a fish processing industry and other supporting industries, namely the fish fillet industry	√

Based on the technical criteria stipulated in Government Regulation No. 27 of 2021, there are five variables that affect the performance of fishing ports. The following is an analysis of the suitability of each variable to the existing conditions at the Bungus Ocean Fishing Port (PPS).

**Variable 1: Fishing Vessel Services in Indonesian Waters, ZEEI, and High Seas**

PPS Bungus has met this technical criterion by issuing a Sailing Approval Letter (SPB) for fishing vessels. Vessels that obtain an SPB from the Harbor Master at PPS Bungus can sail to fishing grounds in the Fisheries Management Area of the Republic of Indonesia (WPP RI) 572, including the Java Sea waters. This shows that PPS Bungus has met the technical criteria of the first variable in accordance with PP No. 27 of 2021. (Soeryanto *et al.*, 2017) emphasized the importance of the pontoon repair process to support vessel operations in the ZEEI and high seas. Improving navigation and communication facilities at PPS Bungus is also relevant to improving fishing vessel services.

**Variable 2: Mooring Facilities for Fishing Vessels of at Least 60 GT**

PPS Bungus has mooring facilities with a 300-meter pier length that can accommodate around 100 fishing vessels. These facilities include a pier and retaining wall that can serve fishing vessels of 5 to 60 GT. The types of vessels that usually moor at PPS Bungus include Bagan Perahu, Gill Net, Bubu, and Handline Tuna. Bagan Perahu vessels usually moor for 7-15 days, while Handline Tuna vessels moor for an average of 14-25 days. According to research by (Arafat *et al.*, 2020), improving the safety and maintenance of the pier is very important to support port operations. The suggested pier maintenance and repair guidelines can be applied at PPS Bungus to maintain the condition of the mooring facilities.

**Variable 3: Pier Length of at Least 300 Meters**

The length of the pier at PPS Bungus, which reaches 300 meters, has met this technical criterion. The current condition of the pier does not experience significant shallowing or sedimentation. According to Chodriyah & Pralampita (2009), sedimentation usually occurs due

to the deposition of mud carried by river flows and sea wave movements. However, PPS Bungus has succeeded in maintaining the condition of the pier from this problem. Research by Chodriyah & Pralampita (2009) shows that a pier with adequate depth is very important to prevent sedimentation and disruption of ship operations. PPS Bungus has succeeded in maintaining the optimal pier depth for fishing vessel operations.

#### **Variable 4: Fishing Vessel Accommodation Capacity of at Least 100 Units or Total Capacity of 6,000 GT**

PPS Bungus is able to accommodate more than 100 fishing vessels with a total capacity of 6,000 GT. With four docks and a port pool area of 7.5 hectares, PPS Bungus can accommodate up to 25 tuna handline vessels measuring 10-30 GT in the port pool. A study by (Mutmainah & Adnan, 2018) identified that ports with good accommodation capacity can improve operational efficiency and ship safety. The ship accommodation capacity at PPS Bungus has met these criteria.

#### **Variable 5: Land Utilization and Management of at Least 20 Hectares**

PPS Bungus has utilized and managed 20 hectares of land for the construction of basic, functional, and supporting facilities. This land is used optimally to support port operations, including the construction of docks, port pools, ice factories, docking, and other facilities. (Putra *et al.*, 2020) highlighted the importance of optimizing port land utilization to improve operational efficiency and sustainability. PPS Bungus has utilized 20 hectares of land for various facilities that support port operations.

In accordance with Government Regulation No. 27 of 2021, ocean fishing ports (PPS) must have loading and unloading and marketing activities of fish with an average of at least 50 tons per day to meet the criteria as an ocean fishing port. However, based on the results of the study, the loading and unloading activities of fish and marketing of fishery products at PPS Bungus only reached an average of 2.3 tons per day. This amount is far below the minimum standard set in PP No. 27 of 2021 for the classification of ocean fishing ports. This discrepancy indicates that Bungus PPS does not meet one of the important requirements to be classified as an ocean fishing port, thus potentially lowering its classification to a lower class fishing port. Low loading and unloading activity can have a negative impact on the income of fishermen and fisheries business actors who depend on Bungus PPS. In addition, the lack of activity can also affect the stability of fish prices and the welfare of fishermen.

The low volume of loading and unloading at Bungus PPS can be caused by several factors. The small number of ships anchored is a factor causing the low production of fish landed at Bungus PPS. Bungus PPS is only a berth for fishing vessels measuring 12-30 gross tonnage (GT), although ideally this port is intended for fishing vessels measuring at least 60 GT. Inefficient logistics and distribution problems can also affect the low volume of loading and unloading activity.

#### **Implementation of the Measured Fishing Policy at Bungus PPS**

The implementation of the measured fishing policy (PIT) at Bungus PPS has significant implications in supporting the sustainability of fishery resources and providing economic incentives for fishermen. The PIT policy includes setting a catch limit based on output control and limiting the number of vessels and fishing gear, as well as landing fish at fishing ports where operational permits are granted in accordance with the objectives of the blue economy (Erna *et al.*, 2023; Nurlaela, 2023; Pasaribu *et al.*, 2022; Trenggono, 2023). The quota-based fisheries management model applied in PIT can support the sustainability of fish resources and optimize the economic benefits of the fisheries sector (Nurlaela, 2023). The PIT policy requires actors to land their catch at fishing ports located in the fishing area where they operate or where they have a permit. Through this policy, fish landings are focused on each fishing port where

the fish are caught. Infrastructure improvement begins with the improvement of existing fishing ports and the construction of new ports in fisheries management areas (WPP) that have potential (Lanka, 2006; Nurazizah *et al.*, 2023; N. Salim, 2014).

PNBP (Non-Tax State Revenue) from measured fishing comes entirely from fishing vessels with central permits. The Ministry of Marine Affairs and Fisheries has prepared an electronic measured fishing application (e-PIT) to facilitate the calculation of post-production PNBP. Based on the 2023 Bungus PPS PNBP realization report, until May 2023 there was no post-production PNBP achievement. This is because there are no centrally licensed vessels that catch fish above 12 (twelve) nautical miles and land their catch at the Bungus PPS. Based on research conducted by (Jati & Fitriasia, 2000), the reasons for the absence of 30 GT ships entering Bungus PPS include thuggery and illegal levies at the port reducing the interest of large ships to dock at Bungus PPS, facilities such as docks and port pools have not been optimally utilized, and transportation facilities that do not support fish exports reduce the attractiveness of this port. According to Nurani (2008), there are several factors that cause ships to arrive at the port, namely proximity to the fishing area, ease of entering the port pool entrance, ease of obtaining loading and unloading services, and other facilities as well as the existence of processing industries, exporters, and good market access.

### CONCLUSION

This study shows that the Bungus Ocean Fishing Port (PPS) has various facilities that meet most of the technical and operational criteria in accordance with Government Regulation No. 27 of 2021. However, there are discrepancies, especially in terms of loading and unloading activities and fish marketing which average only 2.3 tons per day, far below the minimum standard of 50 tons per day. The implementation of the measured fishing policy (PIT) has also not been fully optimal due to the lack of centrally licensed vessels anchored at the Bungus PPS.

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