

## ANALYSIS OF THE CONDITION OF XYZ CILEGON PORT FACILITIES USING THE SWOT APPROACH

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**Abstract**

*This research aims to analyze the condition of facilities at XYZ Port, Cilegon using the SWOT approach. The methods used are case studies and literature studies. Primary data was obtained through direct observation and interviews with sources. The research results show that in general the main facilities of Port XYZ are in very good condition with 100% usable facilities. However, there are 7.14% of functional facilities that cannot be used, especially damage to the quay container crane. SWOT analysis identifies the strengths, weaknesses, opportunities and threats facing XYZ Port. The recommendation given is to conduct an in-depth investigation, evaluate maintenance history, and implement a preventative maintenance program to address facility problems.*

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### INTRODUCTION

Ports owned by PT . XYZ Port in the city of Cilegon, which is part of XYZ Port, operates in accordance with Law Number 17 of 2008 concerning Shipping and is categorized as a Terminal for Own Use (TUKS) which serves export and import activities.

Ports play an important role as stopovers for various types of ships, facilitating the transfer of goods between various modes of transportation. Apart from that, ports also function as meeting points between land and sea transportation, illustrating the concept of intermodal transportation (Ma'ruf et al., 2018). Port facility management is an important aspect to ensure efficient and effective port operations. Good and well-managed port facilities can increase productivity and operational efficiency and ensure the sustainability of port operations (Santoso et al., 2019).

This study focuses on analyzing the condition of facilities at XYZ Port, Cilegon, and how facility management can be improved to support better port operations. In improving port facility management, Yuliandra and Jaeba (2017) emphasize the importance of paying attention to various aspects of port facilities. Well-managed

facilities can increase productivity and operational efficiency and ensure the sustainability of port operations. Therefore, port facility management must be carried out well to support better and more effective port operations.

The definition and aspects of port facility management include the management of physical facilities and infrastructure at the port to ensure efficient and effective operations. Well-managed facilities can increase productivity and operational efficiency and ensure the sustainability of port activities, including management of docks, warehouses, transportation equipment and other supporting infrastructure. This research highlights the importance of facility conditions and management at XYZ Port, Cilegon, and how improving facility management can support better port operations (Santoso et al., 2019).

To analyze the condition and management of facilities at XYZ Port, SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) was used by Andersen et al. (2021). SWOT analysis helps in identifying the strengths, weaknesses, opportunities and threats facing ports, as well as formulating appropriate strategies to improve port facility management and operations. This analysis provides guidance for understanding the internal and external factors that influence port performance and planning necessary improvement measures.

According to Blanco and Paolucci (2020), well-managed ports not only increase efficiency but also have a positive impact on the environment and local economy. Furthermore, research by Parola et al. (2016) show that the integration of technology in port facility management can increase operational effectiveness and supervision, thereby reducing waiting times and operational costs. Pearson et al. (2019) also emphasize the importance of sustainability in port facility management to ensure that these facilities can continue to operate optimally in the long term.

The aim and hope of this research is to provide recommendations that can be applied in overcoming the problem of damage to container crane docks at XYZ Port, Cilegon. This research aims to carry out in-depth investigations to identify the causes of damage, evaluate previous maintenance and repair history to identify trends and damage patterns, and implement a scheduled preventive maintenance program, including routine inspection, lubrication and component replacement. Apart from that, this research also

hopes to implement an effective maintenance management system. Thus, it is hoped that this research can provide a comprehensive and practical solution to extend the operational life of the pier and increase operational efficiency at XYZ Port.

## **RESEARCH METHODS**

The research was conducted at XYZ Port, Cilegon in March 2024. The method used in this research was a case study method and literature study about the condition of facilities to support activities at XYZ Port, supported by SWOT analysis. The aspects studied are the facilities and activities at Indah Kiat Harbor.

The data collected is primary and secondary data. Primary data is obtained by making direct observations or observing at the research location; and interviews with sources who work at XYZ Port by conducting direct questions and answers regarding the condition of the facilities at Indah Kiat Port.

Analysis of the condition of Indah Kiat Harbor:

One of the objectives of this analysis is to ascertain whether all facilities, as well as their condition, exist or not at Indah Kiat Harbor. These facilities include important, important and complementary facilities.

### **Condition of XYZ Port Facilities**

Table showing the condition of being fit for use, exceeding capacity, and not being able to be used in the analysis of the condition of the 27 facilities. This is associated with the area of the facility building adapted to its use, as well as the physical condition of the building observed directly at XYZ Port.

Figure 1 shows the determination of the percentage of facility conditions for all facility groups. Assessment categories will be determined based on the percentage obtained for each facility group. All facility groups have the same condition categories and percentage intervals.

To clarify the distribution of facility condition percentage intervals per category for each facility group, see Figure 2. From this graph, we can also compare the percentage of facility conditions obtained for each facility group at XYZ Port.

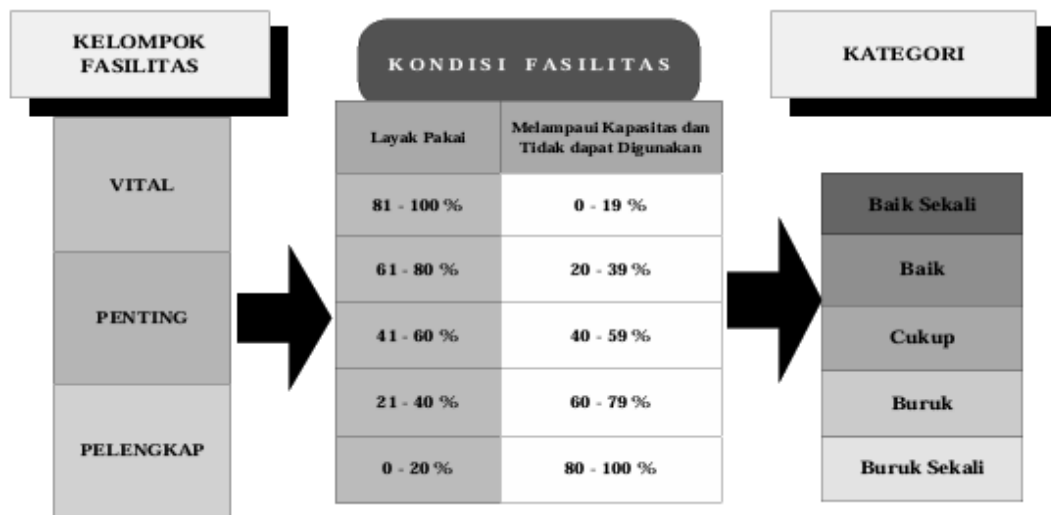


Figure 1. The method for dividing intervals into the percentage of facility conditions per category for each group of facilities has been determined (Novianti, in Najah 2012).

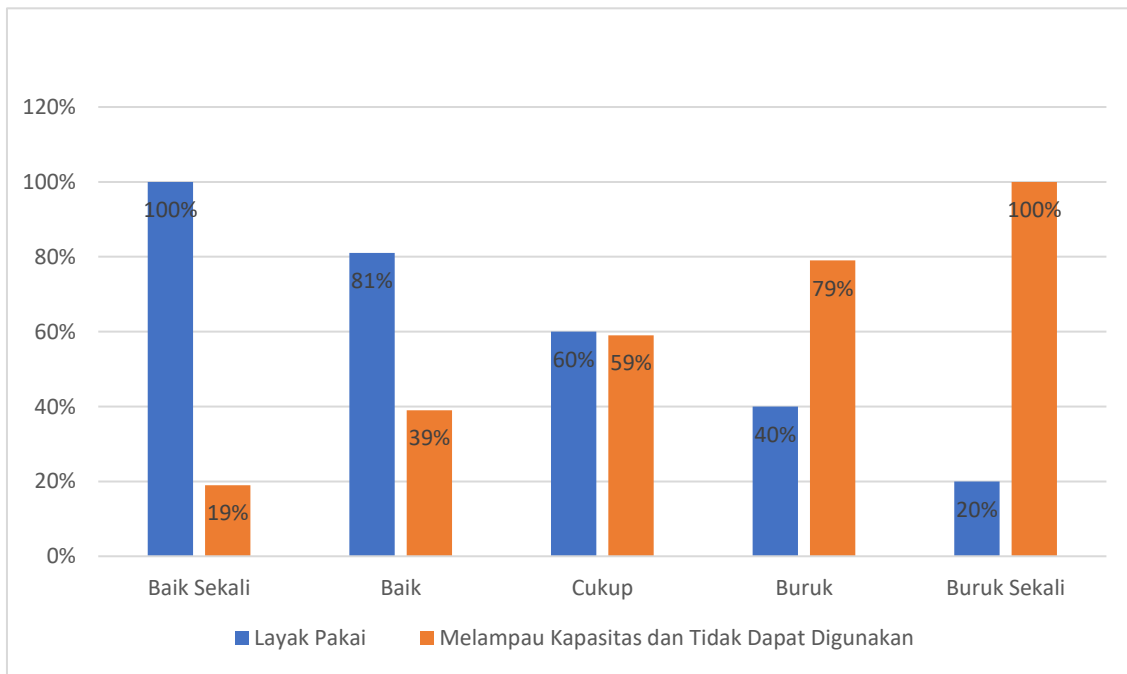


Figure 2. Graph showing the interval distribution of the percentage of facility conditions per category for all facility groups (Novianti, in Najah 2008).

### Facility Conditions to Support Each Activity

The analysis of the condition of facilities that support activities is the same as the analysis of facility needs at XYZ Port. (Novianti in Najah, 2012) usable condition is the main reference in providing assessment categories for facility conditions. If the percentage of usable facilities is high, it shows that the XYZ Port facilities are carrying out their functions well. On the other hand, if a large percentage of the condition of the facility exceeds capacity and cannot be used, it indicates that the facility is not running well and requires improvement.

## **RESULTS AND DISCUSSION**

### **General condition**

Cilegon City is a Steel City in Banten Province. As the center of government, politics, social, education and culture, this city also acts as the economic center of the Banten region. Geographically, Banten Province is located at 106°2'31" East Longitude and 6°0'37" South Latitude. Cilegon City occupies an area of 162.51 Km and has a population of approximately 470,378 people as of December 31 2023. This city is known for its steel industry owned by the Indonesian Government, namely Krakatau Steel, and has several vital objects such as Merak Port, Cigading Port, and Ciwandan Port and other ports.

XYZ Port is located in Cilegon, Banten Province. This port is located at coordinates Latitude 6° 0' 42.7" S and Longitude 105° 46' 34.8" E, with regional boundaries as follows:

- a. Northern Area Boundaries: Borders with Cilegon Village, Pulo Ampel District, Cilegon City and is connected by the Cilegon - Anyer Highway.
- b. Eastern Regional Boundaries: Borders the Sunda Strait and is connected by shipping lines that connect various regions in Indonesia and abroad.
- c. Southern Area Boundaries: Borders Merak Village, Merak District, Cilegon City and is connected by the Cilegon - Merak Highway.
- d. Western Regional Boundaries: Borders Kalimekar Village, Jombang District, Cilegon City and is connected by the Cilegon - Jombang Highway.

### **Main Duties and Functions of the Unload Port**

Based on Minister of Transportation Regulation Number 15 of 2021 concerning Implementation of Occupational Safety and Health at Ports, the main duties of loading and unloading ports are:

1. Provide a place for loading and unloading activities and storage of goods.
2. Providing facilities for loading and unloading activities and storing goods, such as docks, warehouses and loading and unloading equipment.
3. Providing loading and unloading services and storage of goods.
4. Organize loading and unloading activities and storage of goods at the port.
5. Supervise the loading and unloading activities and storage of goods at the port in order to comply with the applicable provisions.
6. Provide training to loading and unloading operators and loading and unloading personnel.

Based on Minister of Transportation Regulation Number 72 of 2016 concerning Shipping Routes and National Port Networks, the functions of loading and unloading ports are:

- a) Become a center for loading and unloading and storage of goods in an area.
- b) Become part of the national and international transportation network.
- c) Supporting economic activities in an area.

Other functions of the loading and unloading port based on Law Number 17 of 2008 concerning Shipping are:

- 1) Increasing the efficiency of logistics activities.
- 2) Increase the effectiveness of goods distribution.
- 3) Increasing economic growth in a region.
- 4) Creating jobs for the community.
- 5) Creating business opportunities for the community.
- 6) Improving community welfare.

### **Analysis of the condition of facilities at XYZ Port**

The condition of a facility influences how well it carries out its role as a loading and unloading port (PBM), which requires maintenance in addition to its basic needs. How much of each item or facility can be used and utilized optimally by the user to fulfill

its intended purpose depends on its conditions. Article 21 paragraph 2 explains that the land area allocation plan as intended in paragraph (1) is prepared based on the following criteria:

- a. Basic Facilities
- b. Functional Facilities
- c. Supporting Facilities

## **1. Basic Facilities**

According to Chen (2021) basic port facilities are basic infrastructure that is absolutely necessary for smooth port operations. These facilities include docks, shipping lanes, goods storage areas (TPB), warehouses, transportation routes.

In general, when compared with the definition of port functional facilities as explained above, the basic facilities available at XYZ Port can be said to be adequate. XYZ Port has been equipped with various basic port operational infrastructure such as port pools, docks, port area roads, drainage, covered goods warehouses and container yards. The current condition of XYZ Port's basic facilities can be seen in Table 1. There are 100% of the basic facilities in a usable condition. Basic facilities are included in the very good category because in terms of condition, all basic facilities are 100% usable and 0% unusable. This shows that PT IKPP is equipped with all the facilities needed to carry out its operational activities.

## **2. Functional Facilities**

According to Hu & Chen (2020) port functional facilities are infrastructure that supports specific port operational activities. These facilities include loading and unloading equipment, information systems, safety support facilities and security support facilities.

In general, when compared with the definition of port functional facilities as explained above, the functional facilities available at XYZ Port can be said to be adequate. XYZ Port has been equipped with various essential functional port operational infrastructure, such as offices, hoppers, workshops, scales, water supply, electrical installations, telecommunications, internet, trucks, quay container cranes, forklifts, signs, lighting, height measuring posts. The current condition of XYZ Port's functional facilities can be seen. Table 1 shows that 92.86% of the functional

facility group is in a usable condition and 7.14% cannot be used. The quay container crane at pier 1 is a functional facility that cannot be used due to damage to the crane due to lack of maintenance.

The functional facilities group plays an important role in helping smooth activities at XYZ Port, although it is not as big as the basic facilities group, so its condition cannot be ignored. Quay container crane is necessary equipment for loading and unloading operations. If the quay container crane cannot be used, the loading and unloading of containers will be hampered, making the loading and unloading process less efficient.

### **3. Supporting Facilities**

According to Al-Khatib & Salem (2019) port supporting facilities are infrastructure that supports activities at the port, but is not directly related to port operations. These facilities include port offices, banking facilities, health facilities.

In general, when compared with the definition of port functional facilities as explained above, the supporting facilities available at XYZ Port can be said to be adequate. XYZ Port has been equipped with various port supporting operational infrastructure such as guard posts, places of worship, canteens, toilets and parking. A group of supporting facilities with 80% of its facilities in a usable condition and a percentage of facilities exceeding capacity of 20%, this group of supporting facilities directly contributes to the smooth operation of loading and unloading ports. The place of worship located in the administrative office is a supporting facility that has exceeded its current capacity, so it is necessary to expand the office to create a prayer room inside the administrative office or a separate prayer room outside the administrative office.

**Table 1.** Condition of XYZ Port Facilities

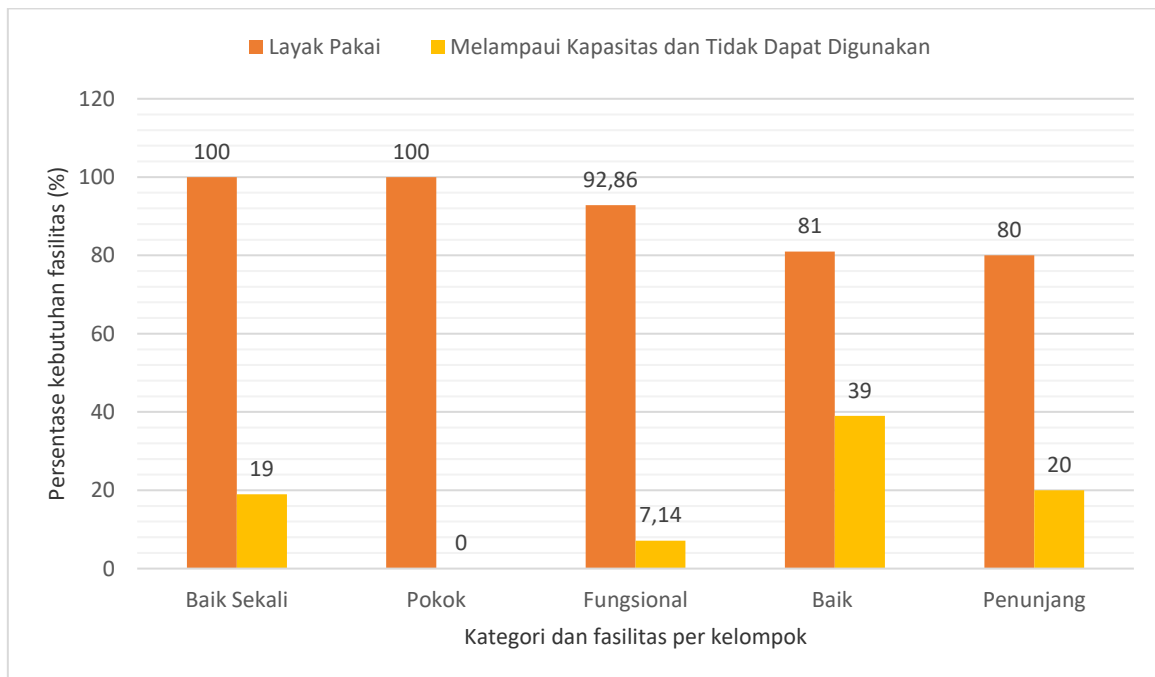


No	Jenis Fasilitas	Fasilitas	Kondisi Fasilitas		
			LP	MK	TDG
1	Pokok	Kolam Pelabuhan			
2		Dermaga Pelabuhan			
3		Jalan Area Pelabuhan			
4		Drainase			
5		Gudang Tertutup Barang			
6		Gudang Curah Kering			
7		Container Yard			
8		Alur Pelayaran			
		Jumlah	8	-	-
		Persentase (%)	100	-	-
1	Fungsional	Kantor			
2		Bengkel			
3		Hopper			
4		Timbangan			
5		Pasokan Air			
6		Instalasi Listrik			
7		Telekomunikasi			
8		Internet			
9		Truck			
10		Quay Container Crane			
11		Forklift			
12		Rambu-Rambu			
13		Penerangan			
14		Pos Ukur Ketinggian			
		Jumlah	13	-	1
		Presentase (%)	92,86	-	7,14

1	Pos Penjaga	4	1	-
2	Tempat Ibadah	4	1	-
3	Penunjang Kantin	4	1	-
4	Toilet	4	1	-
5	Parkiran	4	1	-
Jumlah		4	1	-
Presentase (%)		80	20	-

**Table 2.** Conditions per facility group with categories determined based on the percentage obtained from XYZ Port

Kondisi Fasilitas			
Pokok; Fungsional; Penunjang			
Kategori	Layak Pakai	Melampaui dan Tidak digunakan	Kapasitas dapat
Baik Sekali	81 - 100 %	0 - 19 %	
	100 %	Pokok	0 %
Baik	92,86 %	Fungsional	7,14 %
	61 - 81 %		20 - 39%
Cukup	80 %	Penunjang	20 %
	41 - 60 %		40 - 59 %
Buruk	21 - 40 %		60 - 79 %
	0 - 20 %		80 - 100 %



**Figure 3.** Conditions per facility group with predetermined categories based on the percentage obtained at XYZ Port

Based on Figure 3, it can be concluded that in general the XYZ Port facilities are in good condition very well. Even though the supporting facilities group category is classified as good, this is based on the condition of the main facilities group which is the main reference in achieving the excellent category. The excellent category for the basic and functional facilities group, however, supports this decision and shows that overall, the condition of the facilities supporting activities at XYZ Port is very good. Thus, it can be concluded that all these facilities are in **good condition** very well.

### SWOT Analysis of XYZ Port

**SWOT Analysis** is a strategic tool that is widely used to evaluate the strengths, weaknesses, opportunities, and threats in an organization, project, or particular situation. This tool helps decision makers understand the internal and external conditions they face, so they can formulate the right strategy to achieve goals (Joshi & Pandey, 2020).

#### a. Internal factors

##### 1. Strength (strength)

- XYZ Port has basic facilities that are complete and 100% in usable condition, including docks, harbor pools, warehouses and container yards.

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- Most of the functional facilities (92.86%) are also in usable condition, such as offices, hoppers, scales, electrical systems, telecommunications and loading and unloading equipment.
- The port is located in a strategic location, bordering the Sunda Strait and connected to the main highway.
- The port supports economic activities and the steel industry in Cilegon City and Banten Province.

## 2. Weakness

- There are 7.14% of functional facilities that cannot be used, especially the quay container crane at pier 1 which was damaged.
- Some supporting facilities (20%) have exceeded capacity, such as narrow places of workshop.
- Air quality during loading and unloading activities is not good

## b. External Factors

### 1. Opportunities

- Economic and industrial growth in Cilegon City and Banten Province can increase loading and unloading activities at the port.
- Repairing and increasing the capacity of functional and supporting facilities can increase port efficiency and productivity.
- Implementing an integrated maintenance management system can increase the reliability of loading and unloading equipment.
- Developing port infrastructure and connectivity as well as adopting new technology can strengthen the role of ports in national and international transportation networks.

### 2. Threats

- Competition with other ports around the Sunda Strait which also serve industry and trade in Banten Province.
- Changes in policies and regulations related to port management that can affect port operations.

Overall, XYZ Port has good facility conditions, but still needs improvement and capacity increases, especially in functional and supporting facilities. This port has the potential to increase its role in supporting economic and industrial growth in the Cilegon City area and Banten Province, but must also pay attention to competitive threats and other external factors.

Recommendations that can be applied to overcome the problem of quay container crane damage at XYZ Port are first melcarry out an in-depth investigation to identify the cause of damage to the quay container crane. This is in line with the solutions offered (Santoso et al., 2019). After carrying out the investigation, evaluate the history of previous maintenance and repairs to identify trends and damage patterns (Setiawan et al., 2021). After carrying out investigations and evaluations, what was done according to Prayogo & Rahayu (2020), was to implement a scheduled preventive maintenance program, including regular inspection, lubrication and component replacement. The final recommendation is to implement an effective maintenance management system, including historical recording, failure analysis, and risk-based maintenance planning (Saputra et al., 2021).

Recommendations based on the weaknesses and threats of Port , especially related to air quality during loading and unloading activities through the implementation of better technology and environmental management systems to reduce negative impacts on the environment around the port (Wang & Notteboom, 2021), development of port connectivity and infrastructure to strengthen the role of XYZ Port in the national transportation network and internationally by adopting new technology and innovation to increase port productivity and competitiveness (Al-Khatib & Salem, 2019), as well as strengthening marketing and promotional strategies to attract more ship visits and loading and unloading activities by optimizing the potential of the port's strategic location and supporting growth economy and industry in the Cilegon City area and Banten Province (Joshi & Pandey, 2020).

## **CONCLUSIONS AND SUGGESTIONS**

Overall, XYZ Port has good facility conditions. This port has the main strength in basic facilities which are complete and 100% usable, and most of the functional facilities (92.86%) are also in good condition. The port's strategic location near the Sunda Strait and its support for economic and industrial activities in Cilegon City and Banten Province are also strengths of this port. However, there are several weaknesses that need attention, such as 7.14% of functional facilities that cannot be used and several supporting facilities that have exceeded capacity.

XYZ Port has the potential to increase its role in supporting economic and industrial growth in the surrounding area. Opportunities that can be utilized include repairing and increasing facility capacity, implementing an integrated maintenance management system, as well as developing infrastructure and adopting new technology. However, this port also faces threats in the form of competition with other ports in the Sunda Strait as well as changes in policies and regulations related to port management. Therefore, an appropriate strategy is needed to optimize strengths and opportunities and minimize weaknesses and threats faced by XYZ Port.

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