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Comparative analysis of eco port policies in Egypt and Indonesia

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Abstract
Activities at the port can cause damage to the environment. The impact can occur on air quality, water, and noise, to produce waste. Environmental damage at the port needs to be handled by managing the port in an environmentally sound manner that prioritizes environmentally, economically, and socially sustainable principles. The concept of ecologically friendly ports has been implemented in Egypt at Damietta Port and in Indonesia at the Nizam Zachman Ocean Fishing Port. This study analyzes the comparison of two ports in the two countries based on the implementation of eco-port policies and determines the positive and negative sides of the policy. Literature and comparative studies on the performance of eco ports were carried out for this research by analyzing the relevant theoretical basis from scientific journals, websites, and reports from related institutions. Based on the literature review analysis, Damietta Port in Egypt and the Ocean Fishery Port of Nizam Zachman Indonesia have implemented the eco port concept in managing their seaports. However, several positive and negative impacts must be addressed from implementing this policy based on environmental policy regulations, technical benefits, economic benefits, and humans

Keywords: eco port; Egypt; Indonesia; policy; sustainable

1. Introduction

Environmentally friendly port management (eco port) is a management concept that applies the principles of sustainable development that integrates social, economic, and environmental dimensions in a balanced way (Puig et al., 2017). Activities at these ports cause minimal damage to the environment and society and provide measures to improve and control air, water, noise, and waste quality (Elhamed & Mohamed, 2023). This definition has become known and applied in various countries with ports worldwide.

The eco port concept was first initiated in 1997 and started projects in 2003-2005 at more than 100 ports in Europe; until 2011, this concept was integrated into the structure of the European Sea Port Organization (ESPO) (Lubis, 2011; Puig et al., 2017). In addition to public or commercial ports, this concept is also applied in constructing fishing ports known as eco-fishing ports. Lubis (2012) defines Eco Fishing Port (EFP) as a port management framework to achieve a balance between the environmental and economic benefits so that there is a balance between commercial and environmental aspects in supporting sustainable fisheries management.

One country that has implemented an eco port or green port is Egypt. The Egyptian government pays attention to the marine sector from its port development. The Ministry of Transport seeks to turn Egypt into a global energy, trade, and logistics center at the regional, African, and global levels. The development plan is based on the integration of Egyptian ports through the creation of an integrated scheme that includes an investment map of Egyptian ports, the full geographical coverage of Egyptian sea transportation services, and

the establishment and development of superior infrastructure and ports according to the market economy and international standards with environmentally sound ports. One port that implements the eco port concept in Egypt is the Port of Damietta (Elhamed & Mohamed, 2023).

Eco fishing ports in Indonesia were first implemented through a collaboration between the Governments of Indonesia and France in 2013 in 6 fishing port locations, namely Bungus Ocean Fisheries (PPS), Belawan PPS, Nizam Zachman PPS, Kendari PPS, Bitung PPS and Archipelago Fisheries Port (PPN) Palabuhanratu (Ode et al., 2014; Zebblon et al., 2016). The implementation of this eco-fishing port is by the development and development goals of the national fishing port in the Decree of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 109 of 2021 concerning the Master Plan for the National Fishing Port, which is to create a superior fishing port as a driver of the regional economy, globally competitive, integrated and insightful environment that provides welfare for the perpetrators (Kementerian Kelautan dan Perikanan, 2021).

Sustainable port management must prioritize environmentally, economically, and socially sustainable principles (Miller & Spoolman, 2016). By applying this principle, humans can adapt to environmental changes for a long time. Based on this background, this paper compares the implementation of environmentally sound port policies or eco ports in Egypt and Indonesia. Next, determine the positive and negative sides of the policy. An overview of eco-port implementation policies in Indonesia and Egypt was obtained through a literature review.

2. Methods

This study compares two ports with the green port concept in Egypt and Indonesia. The Egyptian port used as a reference in this study is Damietta Port, with a location map in Figure 1. Meanwhile, Indonesian port used as a reference is Nizam Zachman Jakarta Ocean Fishing Port, with a port location map shown in the Figure 2.

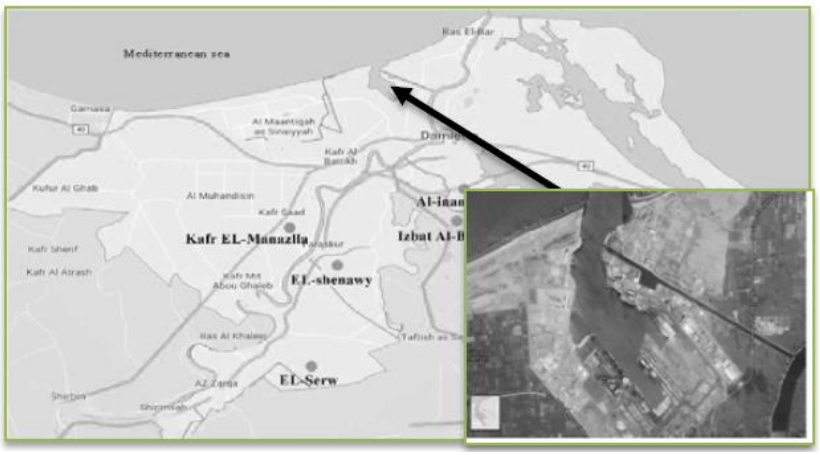

Figure 1. Research location
(Elhamed and Mohamed, 2023)

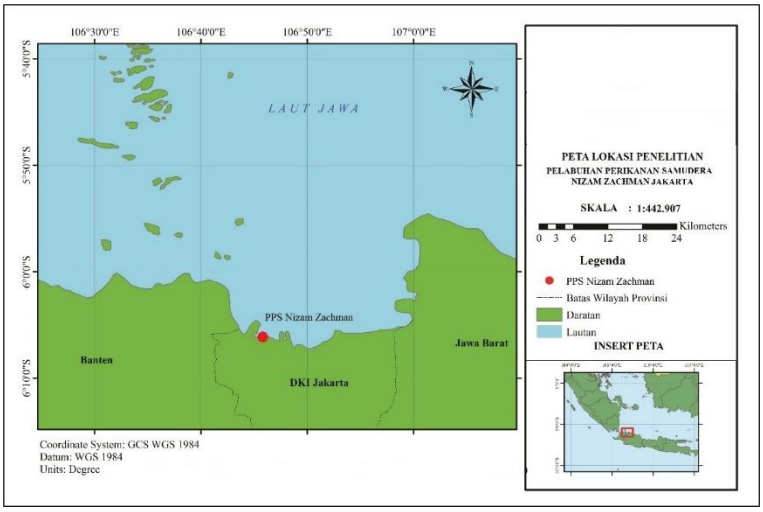

Figure 2. Research location
(Indonesian Geospatial Information Agency, 2023)

This writing uses research methods of literature and comparative studies and analyzes them with relevant theoretical bases. Secondary data is obtained through literature studies, online news, websites, documents, and reports from related institutions. A comparative analysis was conducted to compare the implementation of eco ports or green ports in Egypt and the implementation policies of the concept of eco ports in Indonesia with. A comparison of policies is described through tables, and the positive and negative impacts are analyzed from the various policies implemented in the two countries. The research results are presented descriptively and supported by the literature.

3. Results and Discussion

3.1. International Eco Port Policy

Environmentally friendly port policies are made to manage sustainable ports to achieve social and economic goals while paying attention to environmental sustainability. Several international laws by the Global Authority have become standards for environmental protection, one of which is applied to seaports. Several international conventions for implementing environmentally sound ports are as follows:

1. The MARPOL Convention for preventing marine pollution by disposing of waste.
2. International convention on oil, pollution, response, and cooperation.
3. International convention for harmful anti-fouling systems of ships.
4. Regulations regarding environmental factors for ports and wharves as given by World Bank Reference 126/190 (environmental issues should be considered in managing harbors and port areas).
5. GESAMP assessment of the environmental impact of the port development.
6. Port: UNCTAD/SDD/ PORT/1.
7. ESPO 2003 contains the Code of Best Practices in Part III and the Ten Commandments.
8. Eco Port: a report from a project supported by the EU which aims to implement environmental management technologies, create standards and databases, and communicate best practices.

3.2. Existing Condition of Eco Port in Egypt

The intense activities of Egyptian ports that do not pay attention to the environment have a dangerous impact and continue to damage the aquatic ecosystem. Although Egypt's coastal areas are economically and environmentally significant, they are plagued by heavy

industrial and agricultural pollution and the effects of noise on the social and cultural environment (Elhamed & Mohamed, 2023). he environmental quality management system at the Port of Egypt needs to have implemented. The environmental impacts of air, water, and land surface are not considered, so pollution from solid, liquid, and gaseous substances also increases.

African countries have recently started efforts to develop a joint environmental or green port policy as a joint initiative of the Association of Regional Ports (PMAWCA). The United Nations Environment Program, namely the United Nations Environment Program (UNEP), and the non-governmental port environment network in Africa, namely PENAF, have built a green port network aiming to become one of the first ports in the world to implement a green port strategy in 2009.

There are significant regional, temporal, and geographical variations from African countries to make Egypt implement a green port policy for environmental purposes. Ports operate in distinct commercial, political, environmental, and social contexts. Therefore establishing universal criteria for defining or characterizing a green port is highly political. The implementation of the green port policy in Egypt in the Damietta Port case can be seen in Table 1.

Table 1. Implementation of Egyptian port policy

Key factor	Policy
Environmental regulations and policies	- Adoption of port environmental policies and international agreements such as MARPOL - Regulatory oversight to protect the port ecosystem and reduce the possibility of contamination. - Establish mandatory environmental regulations and gradually implement a voluntary screening process for port companies to ease the workload of port authority staff.
Technical benefits	- Developing an excellent green port environment by utilizing the latest technology in green terminal equipment and ship facilities. - Technical Development of an advanced control system that can detect possible sources of pollution and offer real-time pollution prevention solutions.
Economic benefits	- Employ operational cost reduction incentives to convince port users to switch to environmentally friendly operating practices and reduce the adverse impact on the environment. - Give rewards and punishments
Human	- Green port operators must thoroughly understand potential environmental problems, limit resource pollution, and demonstrate corporate social responsibility in the port environment. - Building appropriate connections with stakeholders in the port community is very helpful in implementing green port policies.

The port of Egypt has developed and modernized the port to become a center for research and consultancy in the maritime transport sector. Restructuring Egypt's ports is the most significant of the 20 economic studies. This restructuring includes a study on the development of the backyard of the Egyptian port, the study on the development of the fleet of the Egyptian maritime company, the development of human resources in the maritime transportation sector, and economic, trade aspects and the development of new technologies in the Egyptian port.

Ports of Egypt built a transportation and logistics hub connecting seaports, dry ports, and logistics centers. With that in mind, the Ministry of Transport seeks to turn Egypt into a global center for energy, trade, and logistics at the regional, African, and global levels. The development plan is based on the integration of Egyptian ports through the creation of an integrated scheme that includes investment maps of Egyptian ports, the full geographical coverage of Egyptian sea transportation services, establishment and development of

superior infrastructure and ports following the market economy and international standards, based on JICA and General Commission for Information Egypt.

As one of the pillars of Egypt's international trade, Damietta Port is one of Egypt's most significant ports. The port is approximately 8.5 km west of the Damietta branch of the Nile, west of Ras Al-Bar, northeast of Damietta New Town, and 70 km west of Port Said. Policy in this port as a green port, namely fulfilling and developing human resource capacity, developing a legislative structure in line with local and global developments, following international agreements and commitments, securing the port, and working to improve the international environmental classification of Egyptian seaports to become a green port for investment, the National Road and Transport Network connects Egyptian ports with investment areas. 25% of Egypt's foreign trade volume is transferable thanks to the growth and support of Egypt's maritime merchant fleet, which is also helping to advance maritime tourism.

3.3. Existing Conditions of Eco Ports in Indonesia

One of the eco-port policy implementations in Indonesia is in fishing ports, known as eco-fishing ports. Implementing this eco-fishing port is following the Decree of the Minister of Maritime Affairs and Fisheries Number 109 of 2021 concerning the national port master plan. It supports the latest Minister of Maritime Affairs and Fisheries policies regarding measurable fisheries. In scalable fisheries, the integrity of coastal ecosystems is critical to ocean health, so global warming, excessive and unsustainable economic activities, and coastal exploitation must be addressed. It is hoped that coastal areas will be maintained by increasing the welfare of coastal communities by increasing income through fishing quotas (Trenggono, 2023).

Also related to environmentally friendly fishing ports, the Minister of Maritime Affairs and Fisheries issued a Decree of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 109 of 2021 concerning the Master Plan for National Fisheries Ports. The main points of development and development of Fishery Ports are:

1. Facilitate sustainable and responsible fisheries
2. Drive fishery economic growth
3. Integrating national and international fishery activities
4. Facilitating essential port services and economic development
5. Realizing good fisheries port governance
6. Development of the fishing industry and industries that support fishery activities
7. Construction and development of fishery ports that are evenly distributed to optimize the utilization of fish resources
8. Support the development of integrated marine and fisheries centers and fisheries management institutions
9. Increase the competitiveness of fishery products
10. Developing fishing ports with a blue economy perspective
11. Support the increase in the welfare of fishery business actors
12. Integrate development planning
13. Build integrated development financing
14. Build connectivity between fishing ports

Currently, eco-fishing ports in Indonesia are applied to several large or ocean fishing ports. Suppose the eco-fishing port policy is successfully implemented at that port. In that case, it can become an example for other ports, namely archipelago fishing ports, coastal fishing ports, and fish landing bases. The application of eco ports at fishing ports differs from public ports, especially regarding the ecological aspects of fisheries. One of the objectives of developing fishing ports in Indonesia is environmental sustainability. Dwiyanto Achmad & Yanuwiadi (2019) stated that five environmental aspects are most significant in sustainable port development: waste production, employment, ship waste management, and waste production fluids. Supriyanto (2013) formulates five aspects that will be studied in the implementation of EFP in fishing ports, namely how the environmental management system and the status of its implementation, how the integrated waste management system, what

are the conditions of the components of public service facilities, which are the concern of fishing port managers in environmental management, and what is the sanitary and hygienic condition of the fish landing site (TPI).

3.2. Positive and Negative Impacts of Eco Port Policies in Egypt and Indonesia

The eco-port policy in Egypt and Indonesia's ports has positive and negative impacts. Positive impacts must be continued and developed, while negative impacts must be corrected to improve port environmental management. This impact is based on critical factors: environmental regulations and policies, technical benefits, economic benefits, and people.

Based on critical environmental regulatory and policy factors, the Port of Egypt has three policies. First, the Port of Egypt adopted a port environmental policy and the MARPOL international agreement. Second, implement regulatory oversight to protect the port ecosystem and reduce the possibility of contamination. The third policy is to make environmental regulations mandatory and gradually implement a voluntary screening process for port companies to ease the workload of port authority staff. These three policies have a positive impact, following international regulations to support environmental sustainability. Meanwhile, the negative impact of this policy is that voluntary regulations for port companies need to make them orderly in protecting the environment. If they are required, they will always protect the environment.

An environmentally friendly port, in this case, an eco-fishing port in Indonesia, has two policies on critical environmental regulatory and policy factors. The policy is adopting port environmental policies and international MARPOL agreements and protecting the integrity of coastal ecosystems with measurable fisheries. The positive impact of port policies in Indonesia is compliance with international regulations to support environmental sustainability. Port development must pay attention to ecosystem services to reduce the environmental impact of ports and carry out habitat conservation, restoration, and creation (Okada et al., 2021). However, the negative impact is that a measurable fisheries policy has just been issued and has yet to be fully implemented, so the success of its implementation cannot be determined.

Egypt's eco port policy is based on technical benefits, namely developing an excellent green port environment by leveraging cutting-edge technology in green terminal equipment and ship facilities and the technical development of advanced control systems that can detect possible sources of pollution and offer real-time pollution prevention solutions. This policy's positive impact is that applying green ports is more practical with technology. However, the policy's negative impact is that the use of technology can lead to errors and is not on target, so manual monitoring by port managers must still be carried out. Eco ports that use systems and technology can prevent environmental pollution and eliminate the negative impacts of port activities on the environment (Marzantowicz & Dembińska, 2018).

Eco fishing port in Indonesia has three policies based on technical benefits. The policy is to facilitate sustainable and responsible fisheries, build connectivity between fishing ports, and build and develop fishing ports that are evenly distributed. The positive impact of the policy is the development of port facilities that are evenly distributed and connected, both for supporting activities at the port. Meanwhile, constructing facilities at ports can harm the environment, such as creating waste and pollution, which can be a negative impact. Pollution at ports can cause pollution. In research Cammin et al., (2022), it was explained that ports need to make reports related to the number of emissions to be able to control the environment.

The policy implemented by eco port Egypt in terms of economic benefit is employing operational cost reduction incentives to convince port users to switch to environmentally friendly operating practices, reduce the adverse impact on the port environment, and reward and punish stakeholders in the port. These two policies positively motivate port users to carry out environmentally friendly practices because there are awards. However, the negative impact is that port users only pay attention to the environment because they

expect appreciation rather than because of self-awareness. Innovative sustainability should play an important role. Eco ports must take approaches and methods from planning, planning objectives, planning processes, and priority perspective initiatives to provide stakeholders with an understanding of the importance of protecting the port environment (Wu et al., 2020). Collaborative and cooperative practices at the port will raise stakeholder awareness in eco port management.

Eco fishing port Indonesia has five policies based on crucial factors of economic benefits. The first policy is developing the fishing industry and industries that support fishing activities. Second, support the development of integrated marine and fisheries centers and fisheries management institutions. Third, increase the competitiveness of fishery products. The fourth policy is to develop fishing ports with a blue economy perspective. The fifth policy is based on economic benefits, namely supporting the improvement of the welfare of fishery business actors. The positive impact of the policy is that the number of industrial and fish trading sectors in ports can improve the community's economy. While economic activity at the port expects maximum profit, thus allowing excessive exploitation of fish resources will have a negative impact. Oceans and marine resources are very relevant for achieving Sustainable Development Goals, and this relevance has given rise to a blue economy approach (Vega-Muñoz et al., 2021). So the blue economy needs to be socialized and made additional rules so that economic activity continues to pay attention to the sustainability of resources.

Based on the critical human factor, there are two Egyptian eco-port policies. The first policy, green port operators, must thoroughly understand potential environmental problems, limit resource pollution, and demonstrate corporate social responsibility in the port environment. The second policy is to build connections with stakeholders in the port community in implementing green port policies. The positive impact of this policy is that operator knowledge and stakeholder connectivity can streamline the implementation of green ports. The policy's negative impact is that only parties at the port know about the implementation of the green port. In contrast, outside visitors do not know, so outside visitors need to understand the implementation of this policy.

Eco-fishing ports in Indonesia have three policies based on critical human factors. The policy is to integrate national and international fishing activities, facilitate essential port services and economic development, and realize good fishing port governance. The positive side of the policy that has been proposed can be a good idea if it can be implemented in fishing ports. However, the policy still needs to be concrete and general. It is best to focus on developing human resources for implementing eco-fishing ports. The role of port authorities in human resource development is significant for maintaining relationships with stakeholders (Sornn-Friese et al., 2023).

4. Conclusions

Based on the literature review, Egyptian and Indonesian ports have implemented the eco port concept in managing their seaports. However, several positive and negative impacts must be addressed from implementing this policy based on environmental policy regulations, technical benefits, economic benefits, and humans.

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Author Contribution

Conceptualization, Dimas Andriyanto and Raldi Hendrotoro Seputro Koestoer; Methodology, Dimas Andriyanto; Validation, Dimas Andriyanto and Raldi Hendrotoro Seputro Koestoer; Formal Analysis, Dimas Andriyanto; Resources, Dimas Andriyanto; Data Curation, Dimas Andriyanto; Writing – Original Draft Preparation, Dimas Andriyanto; Writing – Review & Editing, Dimas Andriyanto and Raldi Hendrotoro Seputro Koestoer; Visualization, Dimas Andriyanto.

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The authors declare no conflict of interest.

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