

THE POTENTIAL OF BLUE ECONOMY IMPLEMENTATION FOR INDONESIA'S MARITIME TRANSPORT

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Abstract

Within the discourse of sustainable development, the concept of Blue Economy has received more attention from countries whose crucial sectors are oceans, including Indonesia. The geographical characteristics of Indonesia, as the biggest archipelagic country in the world, brings ocean-related sectors to the top priorities of the Indonesian government. In 2014, President Jokowi committed to adopting the blue economy concept in sectors related to the use of ocean, including maritime transport as one of the targeted sectors. Applying the agency theory to state policy implementation, this article aims to analyse the potential of Indonesian blue economic policies for developing its maritime transport. According to library research and interviews conducted by the author, Indonesia's maritime transport has a great potential in contributing to the national economic growth. However, looking back at the development of maritime transport in Indonesia, this article highlights a gap between the sector's potential and its actual contribution to the Indonesian economy. A Sustainable Maritime Transport System, published by the International Maritime Organisation (IMO) in 2013, serves as a great tool for the Indonesian government to help Indonesia meet its greatest potential in maritime transport. In line with the blue economy concept, four aspects of the system align with Indonesia's focus of concerns: safety of labours, marine pollution, energy saving, and development of port infrastructure. Implementing the blue economy concept has the potential to not only optimise maritime transport's economic benefits but also ensure longevity of ocean resources in Indonesia.

Keywords: maritime transport, blue economy, sustainable development, port development, policy and governance

Introduction

The first introduction of the sustainable development concept was formally presented in the Brundtland Report, which defines sustainable development as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’ (World Commission on Environment and Development [WCED], 1987, p. 43). 2012 the 17 Sustainable Development Goals (SDGs) were launched during the Rio+20 multilateral conference for national implementation. At the conference, former Indonesian President Soesilo Bambang Yudhoyono highlighted the significance of the blue economy for Indonesia. Given its status as the country with the second longest coastline in the world, after Canada, and its reliance on ocean-related sectors as a source of income and food consumption (Nurhayati, 2013), implementing the blue economy is considered crucial.

The blue economy concept was further advanced in the subsequent term by Indonesia’s next President, Joko Widodo, commonly addressed as Jokowi. During his inauguration in October 2014, President Jokowi outlined his grand vision to establish Indonesia as a ‘global maritime nexus’ (*Poros Maritime Dunia*, PMD) (Neary, 2014, para. 2). To achieve the PMD vision, the Indonesian government, under President Jokowi’s leadership, has committed to the blue economy approach (Tempo.co, 2017).

Maritime transport stands out as a targeted sector area aligned with the PMD vision’s key aspect. According to Smith-Godfrey (2016), the maritime transport sector falls under one of the blue economy’s economic activities: ‘trade of resources’ (p.5). This economic activity category includes services such as the transportation of resources and tourism facilitated through ports, infrastructure, and coastal development. This article aims to analyse the potential impact of Indonesia’s blue economic strategy for maritime transport during President Jokowi’s first term (2014-2019) on contributing to Indonesia’s overall economic growth.

Literature Review

Scholars frequently engage in discussions about the maritime transport sector in Indonesia due to its crucial role in the country’s overall development. In 1999, Pangaribuan analysed various factors, government policies and the significance of Indonesia’s interisland maritime transport. The dissertation highlights some problems in Indonesia’s maritime transport, such as ineffective port services and a lack of skilled labourers. Hence, he recommended that the Indonesian

government facilitate labour training, enhance financial subsidies for international shipping, simplify procedural requirements in ports, and actively support shipping companies (Pangaribuan, 1999). However, the study needs to be updated with the latest policy of the recent government, especially due to the commitment of President Jokowi to adopting the blue economy concept.

Regarding the application of the blue economy concept in a particular region, Doyle (2018) discusses the application of the blue economy concept in the countries that are members of the Indian Ocean Rim Association (IORA), which is accumulatively projected to accommodate nearly half of the world's population in 2050. He analyses the efforts related to the blue economy strategy, particularly since the 2014 IORA Blue Economy Declaration. His findings suggest that the IORA member states are more committed and interested in developing their blue economy. Indonesia, emphasising "strong inclusive growth and poverty alleviation emphasis", has been collaborating with other countries, such as Malaysia, India and Australia, to form its blue economy (Doyle, 2018, p. 3). The article has shown how the blue economy has triggered national and regional initiatives among IORA member states. Duha and Saputro also studied the linkage of Indonesia's membership in IORA and the potential of implementing the blue economy in empowering Indonesia's economy and defence. The study highlights that the 'blue economy is a very profitable strategy for Indonesia to increase National Income' by referring to Indonesian government's vision of making Indonesia a World Maritime Axis and IORA's priority in implementing the blue economy (Duha & Saputro, 2022, p. 514). The research delves into various sectors, including fisheries, sustainable coastal areas, marine biotechnology, marine tourism, crude oil, and sea transport. However, while the study has concluded on the importance of strategic management in using the blue economy concept, it lacks a deeper analysis of the maritime transport sector and focuses more on fisheries and its potential contribution to Indonesia's economy.

In 2021, the World Bank published a report on the potential of implementing a blue economy in Indonesia, providing policy recommendations based on President Jokowi's initiatives in the blue economy. After highlighting the importance of oceans for the country and delineating long and short-term challenges in ocean sectors, the World Bank suggests a blue economy strategy President Jokowi has applied through his initiatives. The report emphasises the need for substantial investments and policy reforms based on government initiatives. According to the World Bank (2021, p. 68), "[c]lose ecological and economic links between ocean sectors means that reforms can deliver broad benefits", thus creating an integrated policy for the blue economy. The blue

economy concept is perceived as a crucial part of the big roadmap for achieving sustainable development through policy integration.

Numerous studies have emphasised the benefits of the blue economy for Southeast Asia. Gamage (2016) analyses the potential and challenges of blue economy implementation through the Association of Southeast Asian Nations (ASEAN). Sari and Muslimah (2020) focus on the fisheries sector and its potential gains from the blue economy concept. While previous studies have clearly explained the potential of the blue economy in supporting Indonesia's growth, they have examined it from a regional perspective or within specific sectors, such as fisheries and marine tourism. It leaves room for more research in other crucial sectors of Indonesia, particularly in maritime transport. Previous studies on the maritime transport sector have typically focused on case studies of individual ports or specific policies in Indonesia. Hence, a study needs to be conducted on the holistic approach of the Indonesian government under President Jokowi in adopting the blue economy concept for Indonesia's maritime transport. Analysing the potential of the blue economy for maritime transport in contributing to Indonesia's economic growth is necessary to trigger further research in this sector.

Methodology

This article used qualitative research methodology to comprehend the concept of the blue economy and elaborate on aspects suitable to Indonesia's maritime transport sector. By understanding the concept comprehensively, the author could deeply analyse its potential implementation in Indonesia and identify the correlation between the concept and areas in which Indonesia is currently lacking. Qualitative research methodology facilitates the exploration of crucial issues that need to be addressed. The author collected library research data from secondary sources, including government reports, books, newspapers, online articles, and journal articles related to Indonesia's blue economy under President Jokowi's first term and Indonesia's maritime transport sector.

Analysis

The role of maritime transport globally has increased significantly, as shown by its increasing share in international trade. According to the United Nations Conference on Trade and Development (UNCTAD), from 1968 to 2018, seaborne has remained the main mode of transport in international trade with a share percentage of trade volume varying from 80 to 90% (UNCTAD, 2018). The rising development of air transport has taken some noticeable share in the trade of higher

valued goods, although its total value remains lower when compared to seaborne trade's value, which holds between 60 to 70% of the international trade's total value. Shipping through maritime transport has been considered a major contributor to improving developing countries' overseas trade and boosting development opportunities. The roles of some developing countries in global seaborne trade started to shift in 2000, transforming from being the main exporters of raw materials and marginal importers of consumer goods to being both "major exporters and importers of finished and semi-finished products" (UNCTAD, 2018, p. 6). However, this shift is not uniform across all developing countries; for example, Asian countries are in the lead in importing manufactured products compared to African and South American countries.

The seaborne trade in Indonesia dates back centuries and is documented through ancestral stories and evidence, such as the Pinisi ship. Historically, domestic and international sailors have come to the country, bringing their goods while introducing their culture, religion, foods, etc. During the pre-colonial era, Indonesia was a region with solid maritime power under the Kingdoms of Sriwijaya and Majapahit. Later, the Netherlands came to Indonesia using ships for trading in the eastern islands. These historical instances show how maritime transport has been an important mode of transport in Indonesia's economic, social, and environmental development. This trend persists today, with around 40% of international trade conducted through Indonesia's seas.

Acknowledging the vast potential of Indonesia's ocean, the estimated value of the ocean economy in Indonesia is calculated to be nearly US\$ 171 billion per year, equivalent to Indonesia's 2013 national budget (Dekin, 2012). However, this economic potential of the ocean has not yet been optimised fully. According to the latest publication by the Coordinating Ministry of Maritime Affairs, the maritime sector's contribution to the national GDP fluctuated from 2010 to 2016 but showed an overall upward trend (Coordinating Ministry of Maritime Affairs, 2017). On average, the maritime GDP contributes 7.06% to the national GDP, reaching the highest percentage of 7.95% in 2012. The maritime sectors are classified into three most dominant clusters: fisheries, energy and mineral resources, and maritime transport. Between 2010 and 2016, the two clusters that contributed the most were energy and mineral resources and fisheries, with each often replacing the other's position as the biggest contributor. As shown in Figure 1, fisheries accounted for 42%, followed closely by energy and mineral resources at 41%. Maritime transport consistently held the third biggest share, contributing 9% in 2016.

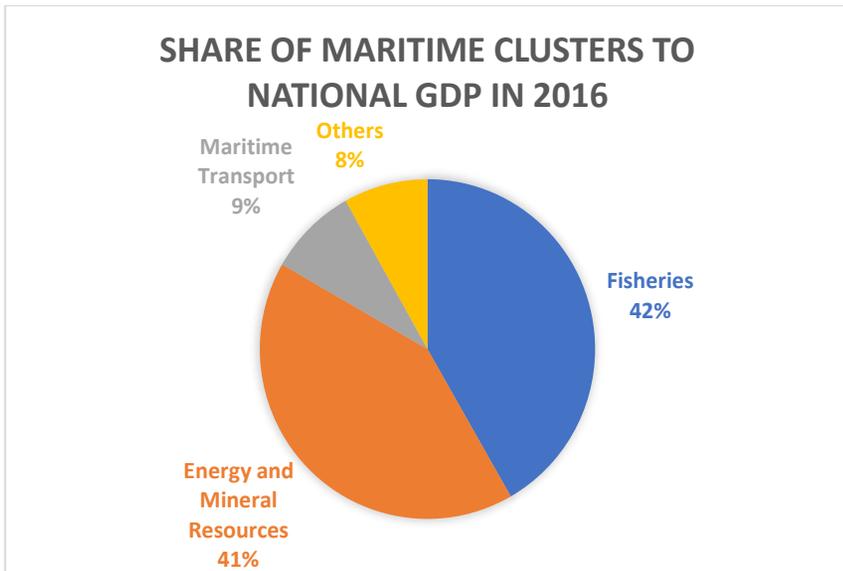


Figure 1: Share of Maritime Clusters to National GDP in 2016
(Source: Coordinating Ministry of Maritime Affairs [2017].)

Although maritime transport is not the biggest contributor, it plays a crucial role in facilitating the shipment of goods to other sectors. A collaborative study published in 2016 analysed the contribution of sectors in the maritime economy to the Indonesian economy, highlighting the key sectors in marine industries. The study found that the maritime sector contributed about 7.86% to the economy's production in 2010. The authors also analysed the sub-sectors with the biggest impacts towards the national economy. Sub-sectors of roads, bridges and ports led the rank with 4.6%, followed by sub-sectors of groundfish and fishery products onshore and sub-sectors of Fish and Fishery Products Capture with percentages of 0.98% and 0.85%, respectively. Furthermore, sub-sectors of roads, bridges and ports were also the lead contributors in terms of employment absorption (1.65%) and the largest value added to the national economy (2.56 %) in the same year. The study argues that there has been "a structural transformation of the economy of Indonesia, particularly moving from fishery to fishery processing industry" (Nurkholis et al., 2016, p. 185). As a result, the fisheries sector acts as a driving force behind the growth of the fishery processing industry as a source of inputs. The findings of the study suggest that the development of the fishery processing industry must align with the development of infrastructure, such as roads, bridges, and ports, to accommodate economic activities. Hence, the infrastructure supporting maritime transport is considered a key sector in Indonesia's maritime development.

The Indonesian National Planning Body and Ministry of Transportation estimated that maritime transport can contribute to the national income by up to US\$ 20 billion per year. However, this economic potential value is far from being fully optimised. In 2014, maritime transport contributed Rp. 30 billion, equivalent to US\$ 2.04 million; by 2019, it increased to Rp. 50 billion. Equivalent to around US\$ 3.41 million (Statistics Indonesia, 2022b). Despite increased maritime transport's contribution to GDP throughout President Jokowi's first term, it composes merely 1.7% of its potential income. From 2013 to 2021, the GDP contribution of the maritime transport sector showed a stagnant trend at 0.3% as shown in Table 1. Land transport contributed the most to the national GDP from 2013 to 2021 at around 2.4% among the three modes of transport. This percentage gap between seaborne and land transport shows how the potential of maritime transport in Indonesia has not been fully optimised, considering the region of Indonesia that consists mostly of water. Closing this gap is crucial for improving intraregional connectivity within the archipelago.

Table 1: Contribution (%) of Maritime Transport, Land Transport, and Total Transport to GDP in 2013-2021

Year	Maritime Transport	Land Transport	Total Transportation
2013	0.31	1.99	3.27
2014	0.34	2.14	3.67
2015	0.34	2.44	4.21
2016	0.32	2.43	4.36
2017	0.31	2.42	4.53
2018	0.30	2.39	4.50
2019	0.32	2.47	4.60
2020	0.31	2.47	3.62
2021	0.30	2.40	3.41

Source: Statistics Indonesia (2022a).

In accordance with the global trend, the role of maritime transport in Indonesia's international trade has been facing positive growth. In 2017, the volume of unloaded and loaded cargo in Indonesian ports increased by 13.21% and 2.87%, respectively, compared to the previous year. Similarly, the unloading cargo volume of international voyages increased by 13.50%, while the loading volume decreased by 13.02% in the same year (Statistics Indonesia, 2018). According to Table 2 and Table 3, Indonesia's share of shipping has been improving throughout the years, both in foreign and domestic sea freight. Domestically, national vessels could support 79% of cargo shipping in 2008 and

rose to dominate 99% of it by 2011. Nevertheless, shipping to and from abroad is still mostly carried out by foreign vessels. Although the share of Indonesia’s national vessels in exports and imports increased from 7% in 2008 to 10% in 2011, there is room for further improvement. Every year, Indonesia incurs the cost of foreign vessels, amounting to around Rp. One hundred trillion (US\$ 6.9 billion), to transport exported commodities, the values of which often fall below the associated shipping costs (Dekin, 2012).

Table 2: Share of National Shipping Cargo for Foreign Sea Freight

No.	Vessels	Year			
		2008	2009	2010	2011
1.	National	7%	9%	9%	10%
2.	Foreign	93%	91%	91%	90%

Source: Dekin (2012).

Table 3: Share of National Shipping Cargo for Domestic Sea Freight

No.	Vessels	Year			
		2008	2009	2010	2011
1.	National	79%	90%	98%	99%
2.	Foreign	21%	10%	2%	1%

Source: Dekin (2012).

The economic potential of maritime sectors in Indonesia, especially the maritime transport sector, is undeniable. The Indonesian Sea has a wide area of approximately 5.8 million km² of marine waters with 95,181 km of coastline. The sea is rich in natural resources such as fishery products and coral reefs, oil and gas, marine energy, and transport services. Indonesia plays a crucial role in international seaborne trade due to its strategic location between two continents and seas. Around 40% of international trade uses Indonesia’s seas as part of their routes. Furthermore, the status of Indonesia as the biggest archipelagic state also contributes to the significance of maritime transport in Indonesia’s development. However, the low contribution to GDP shows that the big potential of maritime transport has not been fully optimised. The development of maritime transport will increase inter-island connectivity in Indonesia, reducing gaps between central and peripheral regions. Through GDP contribution and inter-island connectivity, the development of maritime transport can significantly support national economic growth.

Findings and Discussions

The roots of the blue economy concept are international agreements regarding sustainable development and the ocean. It includes Agenda 21, the Johannesburg Plan of Implementation, the 2030 Agenda for Sustainable Development and the 1982 UNCLOS. Even though initially championed by small island developing states, the concept applies to countries with maritime potential such as Indonesia. According to the United Nations Development Programme (UNDP), the blue economy “is the utilization of ocean resources for human benefit in a manner that sustains the overall ocean resource base into perpetuity.” (Hudson, 2018, para. 3), while according to the World Bank, “The Blue Economy is sustainable use of ocean resources for economic growth, improved livelihoods and jobs, and ocean ecosystem health”, which consists of activities, such as maritime transport, renewable energy, fisheries, waste management, climate change and tourism (World Bank, 2017). The geographical characteristics of Indonesia bring enormous maritime potential that is suitable for the implementation of a blue economy. The sectors of the blue economy can be divided into fisheries, aquaculture, coastal and maritime tourism, marine biotechnology and bioprospecting, extractive industries (non-living resources), desalination, renewable marine (offshore) energy, maritime transport, ports and related services, shipping, and shipbuilding, waste disposal management, and supporting activities.

Among the sectors of the blue economy, maritime transport plays a crucial role in Indonesia, given its strategic location between two continents and two seas, as well as its expansive sea territory and long coastline. The development of maritime transport in Indonesia has been conducted to increase the sector's economic benefit for the country as well as to improve inter-island connectivity, an important issue in Indonesia. Despite its huge potential, maritime transport in Indonesia has not been fully optimised. Under President Jokowi, the Indonesian government has adopted the blue economy concept as an integral part of maritime transport development in Indonesia.

Through the blue economy, all stakeholders in maritime transport, including central and local governments, private sectors, non-governmental organisations, and civil society, share a unified focus on the sector's sustainable development. In 2013, the IMO published a concept of a sustainable maritime transport system which has a goal to “deliver safe, secure, efficient and reliable transport of goods across the world, while minimizing pollution, maximizing energy efficiency and ensuring resource conservation” (IMO, 2013, p. 2). The sustainable maritime transport system's tenth goal is Ocean Governance, which states that “actors engaged in different uses of the ocean must engage in outreach

and coordination in the interests of ocean protection and good ocean governance” (IMO, 2013, p. 21). This goal highlights the importance of multilevel coordination among actors involved in economic activities related to maritime transport while considering other pillars of sustainability, such as environmental protection and social needs. Government policies and guidelines at the national level are crucial to this issue to develop a sustainable system for maritime transport. Based on the ten goals and actions outlined in the sustainable maritime transport system, four aspects are particularly relevant to Indonesia’s focus of concerns: safety of labourers, marine pollution, energy saving, and development of port infrastructure.

Marine Pollution

Since raising awareness about the environmental aspect of economic development, marine pollution issues have been of significant concern for all stakeholders. The first goal of the sustainable maritime transport system addresses Safety Culture and Environmental Stewardship, where all actors involved are required to “operate responsibly, adhering to best practices and applying them, from the ship’s design stage, through all phases of operation, to its ultimate disposal for recycling at the end of its useful life” (IMO, 2013, p. 12). In maritime transport activities, actors must demonstrate environmental stewardship by implementing the international pollution prevention and environmental protection framework.

As early as 1973, the IMO created the International Convention for the Prevention of Marine Pollution from Ships, commonly known as MARPOL. The MARPOL Convention has been amended several times to maintain its relevance to the current situation. Among the issues discussed in the MARPOL are “pollution from ships by oil; by noxious liquid substances carried in bulk; harmful substances carried by sea in packaged form; sewage, garbage; and the prevention of air pollution from ships” (IMO, 2019, para. 1). The successful implementation of MARPOL is evident in addressing oil pollution. Along with other international frameworks, MARPOL has provided regulations for shipbuilding and measurements to significantly reduce the number of oil spill accidents for the past several decades. Similarly, pollution from ships carrying chemicals has been managed through MARPOL regulations, including those related to packaging, marking, and others, as well as the International Bulk Chemical Code (IBC Code) that was adopted in the International Convention for the Safety of Life at Sea (SOLAS) (IMO, 2019a). Although sewage discharge mainly comes from land activities, shipping may also contribute to this type of marine pollution. Thus, MARPOL also establishes “regulations regarding the ships’ equipment and systems for the control of sewage discharge, the provision of port reception

facilities for sewage, and requirements for survey and certification" (IMO, 2019c, para. 4).

One of the prominent issues in marine pollution that has been receiving the international spotlight is marine plastic debris that cannot degrade and will exist for decades in the ocean. Disturbing pictures of sea animals affected by plastic garbage, such as the iconic picture of a plastic straw stuck in a turtle's nose, have alerted the international community. While the problem is not solely attributed to waste disposal of ships, a significant portion of the garbage comes from shore activities. However, recognising the convenience for ships to discard garbage to the ocean, MARPOL regulates that only "food waste, cargo residues, cleaning agents and additives and animal carcasses" are allowed to be discharged into the sea. All other types of garbage from ships must be processed at ports' reception facilities. According to MARPOL, "Governments are required to ensure the provision of adequate reception facilities at ports and terminals for the reception of garbage without causing undue delay to ships, and according to the needs of the ships using them" (IMO, 2019c, para. 12). In the case of Indonesia, the issues of marine pollution from ships must become one of the government's focus of concerns due to the heavy traffic in Indonesia's seas. The government must be able to accommodate sufficient reception facilities as a basic prevention of marine pollution, along with further efforts in monitoring and controlling the implementation of policies.

Safety of Labours

The safety of labourers in maritime transport is a crucial subject since employees are exposed to dangerous risks like noise, vibrations, artificial lights, ship accidents, chemicals, fatigue, and many others. The International Labour Organisation member states, including Indonesia, have agreed on the Maritime Labour Convention (MLC), 2006, regarding safety and health provisions for seafarers. According to the Convention, "seafarer means any person who is employed or engaged or works in any capacity on board a ship to which this Convention applies" (ILO, 2006, p. 3). The Convention becomes the umbrella of the universal regulations for labourers in maritime transport that needs to be followed by competent authority to make sure the states fulfil seafarers' employment and social rights, as follows (ILO, 2006, p. 4):

1. Every seafarer has the right to a safe, secure workplace that complies with safety standards.
2. Every seafarer has the right to fair terms of employment.

3. Seafarers have the right to decent working and living conditions on board ship.
4. Every seafarer has the right to health protection, medical care, welfare measures and other forms of social protection.
5. Each Member shall ensure, within the limits of its jurisdiction, that the seafarers' employment and social rights set out in the preceding paragraphs of this Article are fully implemented in accordance with the requirements of this Convention. Unless specified otherwise in the Convention, such implementation may be achieved through national laws and regulations, applicable collective bargaining agreements, other measures, or in practice.

According to the Convention, states must adopt the contents of the Convention into their occupational safety and health policies if they have not already done so. The contents included in the Convention are as follows (International Labour Office et al., 2015, pp. 22-23):

- a. working, living, and training environments on ships are safe and hygienic and conform to national laws and other measures for occupational safety and health protection and accident prevention on board ship;
- b. reasonable precautions are taken on ships to prevent occupational accidents, injuries, and diseases, including measures to reduce and prevent the risk of exposure to harmful levels of ambient factors and chemicals and the risk of injury or disease resulting from the use of equipment and machinery on board;
- c. on-board OSH policies and programmes provide for continuous improvement in prevention and take particular account of the safety and health of seafarers under the age of 18;
- d. preventive measures, including engineering and design control, include the substitution of processes and procedures for collective and individual tasks and the use of personal protective equipment;
- e. a safety committee is established on board ships with five or more seafarers and includes seafarer representatives;
- f. mechanisms for inspecting, reporting, and correcting unsafe conditions and for investigating and reporting on-board occupational accidents, injuries and diseases are established, and statistics are maintained, analysed and published;
- g. shipowners conduct risk assessment for OSH management, taking into account relevant statistical data and

- h. seafarers are trained and instructed and provided with occupational safety and health information.

The Convention and other international frameworks serve as the guidelines and measurements for states when making policies to ensure the safety and health of their marine workers. Labour safety as part of the social element of sustainable development is a very important issue since seafarers work on ships and often have to live on board. State governments, through related ministry's bodies or agents, must ensure that employers and ship owners comply with the contents mentioned. Safety of labourers in marine transport

Energy Efficiency

Goal 13 of the SDGs talks about the urgent need to act to combat climate change and its impacts. One of the actions is reducing greenhouse gases (GHG) released into the Earth's atmosphere as the result of various activities and industries, including maritime transport. The use of machinery, ships and other vehicles in the maritime transport sector has contributed to the release of GHG. Therefore, the IMO has adopted the Energy Efficiency Design Index (EEDI) as a compulsory measurement for new ships, and the Ship Energy Efficiency Management Plan (SEEMP), implemented in 2011, is now obligatory for all ships. These breakthroughs were included in the amendments to MARPOL Annex VI in October 2016, marking global shipping as the first international industry sector to adopt an international mandatory GHG reduction regime. The EEDI provides technical measurements for energy efficiency level per capacity mile in new ships, with updates scheduled every five years. The level standards vary for each ship type and size segment.

The EEDI is a non-prescriptive, performance-based mechanism that leaves the industry with the choice of technologies to use in a specific ship design. As long as the required energy efficiency level is attained, ship designers and builders can use the most cost-efficient solutions to comply with the regulations (IMO, 2019b, para. 2). The implementation of the EEDI encourages the development of a more environmentally friendly technology used in the shipbuilding industry as part of the maritime transport sector.

The SEEMP provides "an operational measure that establishes a mechanism to improve the energy efficiency of a ship cost-effectively" (IMO, 2019b, para. 6). The 'cost-effective manner' point of the SEEMP is worth noticing as it makes the measurements more adaptable for ship owners and building companies. The private sector can refer to the SEEMP to match the latest technologies and practices with the required standard of energy efficiency level.

The Energy Efficiency Operational Indicator (EEOI) is one of the monitoring tools provided by the SEEMP to ease the complexities of controlling the efficiency level of ships. Implementing the two measurements will reduce GHG to address climate change and reduce the cost of shipbuilding and fuel consumption.

Since maritime transport encompasses more than just ships, governments should focus on energy efficiency in other aspects, such as port operations. Governments may create regulations regarding using green energy to replace fossil fuels in ports. Electricity in ports used for lighting and machinery can be supported by more sustainably sourced energy tools, such as solar panels. To ensure comprehensive energy efficiency, logistics vehicles, including trucks, must meet certain energy efficiency criteria as a requirement to enter ports and terminals. Furthermore, the government plays a crucial role in monitoring and controlling the obedience of private sectors –locally and internationally- towards the international frameworks to ensure the achievement of GHG reduction targets through energy efficiency.

Port Infrastructure

Port development is crucial for implementing a blue economy in maritime transport, as other critical aspects, such as marine pollution and energy efficiency, often depend on the port infrastructure. A discourse has emerged highlighting the necessity of international regulations in ports to make them the driving force behind sustainable development.

Ports are playing an increasingly crucial role in global actions to combat climate change and reduce shipping emissions, including the supply of low-emission fuels for ships, port call optimisation and just-in-time operations and the transition towards sustainable onshore power supply. These initiatives require enhanced port infrastructure and information exchange (Maritime Executive, 2019, para. 3).

Ports accommodate one of the most important things in reducing marine pollution: reception facility. According to the IMO, reception facilities have significant roles in determining whether MARPOL is being fully implemented or not. As part of MARPOL, the international community has agreed on the ‘zero tolerance of illegal discharges from ships’ policy, which means that ships must bring their garbage to ports and dispose of it accordingly in reception facilities. This requires signatories’ governments of MARPOL to provide adequate reception facilities in their ports as part of their obligations.

Nevertheless, inadequate reception facilities are still the main obstacle of MARPOL implementation. To address this issue, an Action Plan was introduced in 2006 by the Sub-Committee on Flag State Implementation (FSI) to ensure the

success of MARPOL implementation and increase awareness of environmental issues in the maritime transport sector. The Action Plan includes the following measures (IMO, 2019d, para. 4):

1. work items aimed at improving the provision and use of adequate port reception facilities, including work items relating to reporting requirements;
2. provision of information on port reception facilities;
3. identification of any technical problems encountered during the transfer of waste between ship and shore and the standardisation of garbage segregation requirements and containment identification;
4. review of the type and amount of waste generated on board and the type and capacity of port reception facilities;
5. revision of the IMO Comprehensive Manual on Port Reception Facilities;
6. and development of a guide to good practice on port reception facility providers and users.

Providing adequate reception facilities needs thorough planning and appropriate actions since it must not cause delays in shipping. In 2018, the Marine Environment Protection Committee (MEPC) adopted consolidated guidance for Port Reception Facility Providers and Users. The guidance summarises the Annexes of MARPOL regarding the obligations of ships and port operators, although direct reference to the Annexes may be needed. To maintain clean seas and oceans, government signatories to MARPOL are required to provide adequate reception facilities in their ports, which ship operators are obligated to use. Ship operators must also acknowledge national and regional policies regarding the disposal of certain types of garbage, if any. In order to keep ship operators updated with the latest policies, governments have to update their regulations and capacity related to reception facilities on their ports in an online database called the Port Reception Facilities Database (PRFD) (MEPC, 2018). The IMO created the PRFD as part of its Global Integrated Ship Information System (GISIS). It is an open-access online database accessible to the public and can be updated easily by governments.

Conclusion and Recommendations

Acknowledging Indonesia's large seas and coastal areas as the biggest archipelagic country in the world, maritime transport plays crucial roles in enhancing inter-island connectivity as well as generating economic benefits for the country. The contribution of maritime sectors to the national GDP increased to 22% in 2005; however, this percentage is considered low compared to other countries with

smaller sea territories. The maritime transport sector is estimated to contribute up to US\$ 20 billion per year, but this economic potential value is far from being fully optimised. Under President Jokowi's administration and his adoption of the blue economy concept for the National Ocean Policy, all stakeholders in maritime transport now share a unified vision that integrates environmental considerations into the sector's development. While optimising the economic benefits of maritime transport, the Indonesian government has to focus on four specific aspects that require more attention: safety of labour, marine pollution, energy saving, and development of port infrastructure. Implementing the blue economy concept has the potential to positively impact economic growth and ensure the longevity of ocean resources in Indonesia.

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