

Conference Paper

Container Sea Transportation as part of the Masterplan for Economic Acceleration and Expansion in Eastern Indonesia

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Abstract

In order to support sea transportation services, the development of industrial processing (to keep pace with demand) must be included into the integrated economic strategy or economic corridor in the Masterplan for the Acceleration and Expansion of Indonesia's Economic Development in the East. Indonesia also plays an increasingly large role in the global economy and a number of bilateral trade agreements. This is reflected in the improvement in Indonesia's debt rating when the ratings of other countries have actually decreased. Through the MP3EI steps, the acceleration and expansion of economic development will place Indonesia as a developed country in 2025 with a per capita income of USD14,250-USD 15,500. To achieve this goal, real economic growth is needed of around 8.0%-9.0% per year between 2015 and 2025.

Keywords: Master Plan; Containers; Economic Development.

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1. Introduction

In a growing economy, international trade activities known as export-import are growing rapidly. Most of the export activities use the sea transportation mode by means of ships, because in the delivery of export and import goods, the costs incurred will be cheaper and can contain more goods, so sea transportation is the main choice in carrying out these activities. A container is a specially designed package with a certain size, can be used repeatedly, is used to store and simultaneously transport the cargo contained in it. The philosophy behind these containers is the existence of standardized packaging that can be moved to various modes of sea and land transportation easily such as ships, trains, trucks or other transportation so that this transportation is efficient, fast, safe, and allows it to be moved from door to door.

Container Ship is a ship that transports a certain number of containers from one place to another. The container itself is a box-shaped container and various types of

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variations that contain certain items. The design of this container ship is intended to increase the number of container vessels, which have Indonesian flags, especially the number of which is still very minimal. (Calderon & L Serven. (2004). "The Effects of Infrastructure Development on Growth and Income Distribution". p.22) Container those stored in the container yard must experience a change in position due to the entry and exit of other containers. The more movement towards containers, the more costs the container owner company must bear. This results in poor service, and this results in dissatisfaction with container owners due to costs that are felt to be inadequate when their containers are removed from the container yard. Container handling is very much needed because it can affect the safety of the container, so it must be continuously monitored or handled properly so that there is no damage to the container that will be loaded or that will be unloaded. (Ralahalu. (2013). menyebutkan bahwa hingga saat ini Indonesia Bagian Barat (IBB) 194 Jurnal Transportasi Vol. 13 No. 3 Desember 2013: 193-200 berkembang lebih maju dibandingkan dengan Indonesia Bagian Timur (IBT).)

Indonesia is an archipelago, consisting of 17,508 islands, with about two-thirds of the area in the form of a sea, and consisting of several main island groups or clusters. The large area of the IBT with its potential has a great opportunity to increase national economic growth, especially in the agricultural, plantation and mining sectors. There are several ports in IBT that have roles and functions as distribution centers for logistics goods nationally and have several other types of industrial goods that have the potential to be transported Within the framework of implementing the Master Plan for the Acceleration and Expansion of Indonesia's Economic Development (MP3EI) program, particularly at IBT, the government gives special treatment to the construction of distribution centers outside Java, especially to businesses that are willing to finance the construction of supporting facilities and infrastructure. This special treatment includes tax and customs policies, labor regulations, and licensing in accordance with the agreement with the business world. (stowage MUARA: Jurnal Manajemen Pelayaran Nasional Vol 2, No 2, Oktober 2019 ISSN: 2715-6583; <http://jurnal.apn-surakarta.ac.id/index.php/muara>)

Likewise, the placement of the container position on the ship must be placed in a balanced way so as not to cause danger to the ship and must minimize the movement or shift of the container on the ship. For that we need a system that can be used as a planner for the placement and sequence of container movement in ships (Dundovic, Cedomir & Hess, Svjetlana. (2005). "Exploitability of the Port Container Terminal Stacking Area Capacity in the Circumstances of Increased Turnover", ISEP). Advances in transportation technology follow economic and trade developments and trade developments are also influenced by transportation system technology. Transportation plays a role in

expanding the coverage area of the distribution of goods or services, supporting efficient distribution of industrial inputs, and allowing the specialization pattern of production activities to occur, thus creating a concentration of production activities in a certain place, which in turn can lead to “Economics of Scale And *Agglomeration Economics*” (Jinca, M. Y. 2011. *Transportasi Laut Indonesia (Analisis Sistem dan Studi Kasus)*. Surabaya: Brillian Internasional. p.5). In the process of shipping containers from one country to another country or from island to another island, it requires a shipping process. In the process of shipping containers, while waiting to be loaded onto the ship, a container must be placed in the container yard. Likewise, containers that come from ships. Containers stored in yard containers will definitely experience a change in position due to the entry and exit of other containers. The more movement of the container ship, the more costs the container owner company must bear.

The container transportation system, which is a combination of various modes of transportation carried out by using containers, aims to facilitate the transfer of goods by simplifying the loading and unloading system so that it is effective and efficient. (Siahaan, L. D. 2013. *Container Sea Transportation Demand in Eastern Indonesia*. *International Refereed Journal of Engineering and Science (IRJES) ISSN (Online) 2319-183X, (Print) 2319-1821, 2 (9): 19-26*) The integration of the container transportation system with other modes of transportation makes it possible to do a combination of road vehicles, trains, ships or ferries and / or a combination of aircraft, ships, and trains. *Container Sea Transportation in Master Plan Development* (Ho, M.W. & Ho, K.H. (2006). “Risk Management in Large Physical Infrastructure Investments: The Context of Seaport Infrastructure Development and Investment”, *Maritime Economics and Logistics*, Palgrave Macmillan. Vol.8. p.140-168).

On the other hand, the challenges ahead for Indonesia’s economic development are not easy to solve. Domestic and global economic dynamics require Indonesia to be constantly prepared for change. The existence of Indonesia at the new center of global economic gravity, namely the East and Southeast Asia region, requires Indonesia to better prepare itself to accelerate the realization of a developed country with development and welfare outcomes that can be enjoyed equally by all people.

It is in this context that President Susilo Bambang Yudhoyono realizes the need for the preparation of the Master Plan for the Acceleration and Expansion of Indonesian Economic Development (MP3EI) to give direction to Indonesia’s economic development until 2025. Through this acceleration and expansion of economic development, the embodiment of the quality of Indonesian Human Development as an advanced nation is not only through improvements. income and purchasing power alone, but coupled with improved equity and quality of life for the entire nation.

By having two thirds of its territory is water and it is located in a strategic location because it is located at a stopover for world trade routes. Many consider Indonesia's various potentials and advantages, as well as development challenges that must be faced, Indonesia needs an economic transformation in the form of accelerating and expanding economic development towards developed countries so that Indonesia can increase competitiveness while creating welfare for all Indonesian people. The Master Plan for the Acceleration and Expansion of Indonesia's Economic Development (MP3EI) is the first step to encourage Indonesia to become a developed country and to be one of the 10 (ten) major countries in the world by 2025 through high economic growth that is inclusive, just and sustainable.

As an archipelago, which consists of 17,508 islands, with about two-thirds of the area in the form of a sea, and consists of several main island groups or groups. Ralahalu (2013) states that until now Western Indonesia (IBB) 194 *Journal of Transportation* Vol. 13 No. 3 December 2013: 193-200 developed more advanced than Eastern Indonesia (IBT). The role of ports is very important for the realization of MP3EI goals. On the other hand, if the MP3EI can be implemented properly, the implication is that the growth of goods traffic through ports will be higher (KP414 2013). Port development is strongly supported by hinterland growth, the interrelation between hinterland and port is mutually beneficial, because ports have a function as a place that has various facilities to market (export) hinterland products outside the region or abroad, and vice versa as a place to import products from abroad or outside the region to hinterland via shipping lines.

Based on regional aspects, the position of Sulawesi Island which is dominated by the mainland has the opportunity to have quite strategic transportation interactions. On the other hand, the Nusa Tenggara Islands and the Maluku Islands are dominated by the sea area, while the Papua Island has a balanced land and sea area. The lowlands are found in the Maluku Islands and Papua Island, while the highlands are on the Island of Sulawesi and the Islands of Nusa Tenggara. There is a balance between high and low in Papua Island. High vulnerability to natural disasters, such as tectonic earthquakes and volcanic eruptions, as well as forest areas greater than 30%, are found in Papua and Maluku Islands. Areas with moderate levels of disaster prone are on the island of Sulawesi. From the amount of land use, about 70% of the built-up areas are in Sulawesi Island. Areas with various land uses are found in the Nusa Tenggara Islands. Meanwhile, the potential for mining natural resources is in the islands of Papua and Maluku.

In supporting the activities and smooth loading of containers on the ship, of course we can see from the results of the performance activities and the development of the Master Plan whether these activities are efficient or are there any obstacles that affect the performance and results of these activities. There has been a change in the

function of the port to become a multipurpose port serving conventional transportation and container transportation. The problem that arises is that the dock and loading and unloading facilities require adjustment, except for a special container port.

In the activity of loading container ships, there are obstacles that hinder the performance of the ship planner, such as containers from the SOC (shipper owned container) that have entered the container yard (CY) and have not made a booking request to the shipping company and there is damage to the container before and after being shipped. With the MP3EI program from the government, it will encourage the added value of leading economic sectors in various regions, one of which is in the South Sulawesi area and to distribute these superior goods / products a port is needed as supporting infrastructure. With the economic growth of South Sulawesi province which is quite stable and followed by the growth of goods transportation at the Makassar port as well as the increasing traffic of goods entering Makassar through the container terminal, it requires the port to work extra to make the distribution of goods smooth and there will be no congestion at the port.

2. Research Methods

This research is qualitative research, and the recommendations are made based on calculations that have been done, especially for facilities whose needs already or will exceed existing conditions. The tables above illustrate the recommendations which constitute the Container Terminal development plan. The picture of the layout of the existing TPKS and its development plan is shown in the Figure. The research material referred to in this research includes data collection techniques and data processing techniques. Data collection techniques are carried out in the form of primary data and secondary data.

3. Results and Discussion

3.1. Transportation Concept

Transportation is a supporting and stimulating factor for development (the promoting sector) and service provider (the servicing sector) for economic development. The fact shows that there is a relationship between the level of economic activity and the overall need for transportation, in other words if economic activity increases, the demand for transportation will also increase. For this reason, in order to support a steady economic development, it is necessary to achieve a balance between the supply (supply) and

demand (demand) of transportation services (Nasution: 2004). (Badan Penelitian dan Pengembangan Perhubungan. (2010). Studi Lokasi Pelabuhan Utama dan Pengumpul di KTI dalam Perspektif Logistik. Jakarta: Kementerian Perhubungan. p.12) Travel behavior of sea transportation users by looking at their mode choice preferences due to changes in travel costs, travel times, frequencies trips, departure schedules, ship comfort, and ship security / safety (Achmad Afandi Tanjung, 2010).

In the development of inter-island transportation, improvements are made to the existing sea transportation system and the addition of new shipping / ferry routes in areas deemed potential for development. The increase can be in the form of addition or improvement of transportation facilities (ships) that are suitable for serving routes. The addition of ships is not necessarily the addition of docks, because they can use the existing seaports

3.2. Infrastructure Needs and Availability

In an effort to improve transportation infrastructure services, it must be pursued through policies on rehabilitation, repair and addition of existing infrastructure, based on economic considerations. (Tongzon & Ganesalingam (1994), An Evaluation of ASEAN Port Performance and Efficiency. Asian Economic Journal 1994, Vol. 8, No. 3, p 317-330) The main objective is to focus on measures to provide transportation infrastructure services that support production activities and increase exports as well as expand employment and business opportunities, especially for economically weak groups. The direct target is the improvement of the transportation infrastructure network, the improvement of transportation services in both urban and rural areas. The next priority is aimed at increasing the capacity of transportation infrastructure as well as expanding the network and range of services that are really needed by the community, especially in isolated, remote and border areas.

3.3. Container Cargo Commodity

The characteristics and types of commodity goods between IBT and IBB are the types of commodities of food, clothing, buildings, as well as other raw materials and industrial products. These commodity goods are sent to the IBT region through the main ports on the islands of Sulawesi, Nusa Tenggara, Maluku and Papua such as Makassar, Ambon, Sorong and Jayapura, which generally originate from the Tanjung Perak Port of Surabaya and the Tanjung Priok Port of Jakarta.

To avoid the occurrence of enclaves in these growth centers, the Central Government and Regional Governments encourage and strive for the maximum possible linkage with economic development around economic growth centers, such as special economic zones (KEK), which is expected to develop in every economic corridor according to the potential of the region concerned. Probability of demand for domestic container transportation as an output or outcome with the Indonesian economic development acceleration program (MP3EI)

3.4. Container Transportation Traffic

The application of container technology in KTI has spread to major ports and collectors, such as Makassar, Bitung, Ambon, Ternate, Pantoloan, Kupang, Sorong, Manokwari Jayapura and Merauke. The capacity development of container ships has increased every year and in 2009 it was higher than that of cargo ships as shown in Figure 3. Freight ships themselves experienced fluctuating developments and when compared to volume in 2004 and volume in 2009 it decreased. Other ships tend to decline every year. Container Sea Transportation in Master Plan Development.

The container demand model shows that population factors have a strong influence on container trading activities. The agriculture, livestock, forestry and fisheries sectors have an effect on Makassar Port and Sorong Port. Indications like this show that South Sulawesi Province is supply-oriented and serves the needs of industrialized goods in the IBT region. (Kessedes C, Ingram G. (1995). Infrastructure's impact on development: lessons from WDR 1994. *Journal of Infrastructure Systems*. 1(1): 16-32) The sectors with a particularly strong influence variable related to trading via containers at IBT are:

1. mining and quarrying;
2. electricity, gas and clean water;
3. construction;
4. transportation and communication;
5. services; and
6. total population.

In this study, a quantitative forecasting method is used which according to Assauri (1984) can be divided into two parts, namely the time-series forecasting method and the econometric forecasting method. In the time-series method, time is the independent

variable, while in the econometric method, variables other than time are the independent variable. As the dependent variable of the two methods is the variable to be measured.

Further examples can be seen from the movement of container transport in the IBT area, generally coming from the Tanjung Priok port of Jakarta and the Tanjung Perak Port of Surabaya as well as from the Port of Makassar (both South Sulawesi surplus commodities and transit goods from Java Island). The receiving ports are generally the Port of Tenau, Port of Bitung, Port of Ambon, Port of Sorong, and Port of Jayapura Papua and generally the port to port system. Except for the Bitung area, the distribution of containers from the port of Bitung is affordable to the city of Manado with capacity and geometric levels as well as very limited road construction. The movement of containers from Tanjung Priok, Tanjung Perak, or from Makassar only reaches the Container Yards at the respective ports of Ambon, Sorong, Jayapura, Pantoloan, and Tenau. This is due to limited capacity, construction and road geometry. Illustration of container movement pattern. Container Sea Transportation in Master Plan Development.

The number of visits by cargo ships is more than container ships. On the other hand, the volume of cargo on container ships is higher. This is evident in all ports except Kupang Port. This condition shows that the pattern of handling goods at IBT is more oriented towards the use of container ships. The variable that has a strong influence shows that the IBT region, as a developing region, is dominated by the movement of non-agricultural container goods. Mining and others are the leading sectors of the IBT region. (Arika. Analisis Kebutuhan Transportasi Penyeberangan Pada Lintasan. Waipirit-Hunimua. Vol. 04, No. 2, Agustus 2010, ISSN: 1978-1105)

In 2032, it is predicted that the sectors that have the highest contribution value will be the services and trade sectors, hotels and restaurants. This condition indicates a shift in the sector's contribution to GRDP, when in 2012 the agriculture, livestock, forestry and fisheries sectors were the dominant sectors followed by the mining and quarrying sectors (Optimistic Pessimists 200 Journal of Transportation Vol. 13 No. December 3, 2013: 193-200).

3.5. Container Terminal Operational System

In the import process, the containers on the ship are transferred by container crane (CC) to truck trailers to be brought to the stacking yard. Furthermore, the containers are taken from the truck trailer by RTG and placed in the dumping yard. When the containers are sent to the recipient, RTG takes the containers from the stacking yard

and puts them on a truck trailer, to be sent to their destination. The opposite occurs in the export process. The containers are placed in the appropriate stacking yard.

The omission of foreign shipping can be seen from the cargo of foreign ships carrying foreign cargoes (export / import), which controls 90.51 percent (522.5 million tons). Meanwhile, domestic cargo, foreign ships control 50 percent of the total freight (89.8 million tons). This problem is what motivates the author to design a commercial ship as a means of safe, smooth, comfortable, fast, accurate and affordable sea transportation in accordance with the needs of marine transportation facilities in Indonesia.

The formulation of the problem in this final project is about how to design the general plan for a container ship with a size of 208 teu, as well as how the hydrostatic value, stability, resistance, and also the movement. The problem limitation is taken to focus more on the object raised, among others, by conducting a discussion using the Delftship version 4.03 software approach accompanied by other supporting software, and referring to the rules of the Indonesian Classification Bureau (BKI). While the design includes Line Plan, Hydrostatic Diagram, General Plan, Ship Barriers, Ship Stability, and Ship Managing. And does not count the Construction Profile, Engine Room Layout, and Equipment for the ship being carried.

4. Conclusion

Commodities have not been concentrated in an area and ports, the cargo is not balanced between the ports of origin and destination so that it has an impact on logistics transportation costs. The majority of collection and feeder ports require revitalization of adjustments to wheel load and multi-container demands. The depth of the port pool has not been able to serve Generation III container ships (capacity 2,000-3,000 TEUs). Conceptual ship design, multipurpose ship typology (passenger, incessant, wheeled cargo), ship space size should be adjusted to the demand, using goods packaging technology in the form of containers and adapted to natural conditions and port facilities as well as technically feasible.

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