

## SHORT SEA SHIPPING IN INDONESIA : EXPERIENCE FROM OTHER COUNTRIES

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**Abstract** In Europe and the United States, Short Sea Shipping (SSS) has distribute goods effective and efficient. Based on the research's experience in other countries, objectives of this study is to finding indicators of success of Short Sea Shipping (SSS) which can be used to develop the SSS in Indonesia. Base on researchs of 2002 to 2015 , this study obtained 9 (nine) Short Sea Shipping (SSS) indicators which is success in other countries. Competitiveness become the dominant indicator of Short Sea Shipping (SSS) success in other countries. Especially competitive freight costs with other modes. For that it needs to be done efficiency at port and sea. Port services, ship selection, and the availability of transported goods should be optimized to reduce logistics costs.

**Keywords:** *Short Sea Shipping (SSS), Competitiveness, Efficiency*

### 1. Background of Short Sea Shipping

In Europe and the United States, the application of the concept of Short Sea Shipping, has been managed to overcome some of the problems which caused by the implementation of the transportation of goods. Short Sea Shipping makes the distribution of goods to be more effective and efficient. The implementation of Short Sea Shipping has succeeded in improving the movement of goods, which lower levels of air pollution, lower shipping costs and lower infrastructure costs (Perakis and Denisis, 2008). Short Sea Shipping is rapidly developing in Europe and North America has opened an insight into the various parties about the incredible benefits of the transport system and the pattern of distribution of goods. Operation of SSS was very helpful to shift the burden of transport on the road, so the costs of moving goods become more economical and can reduce traffic congestion, air pollution and road maintenance cost savings. In 2001, SSS managed to take the market share of freight transport in Europe by 40%, while road transport get 45%, According to the European Commission (1999), SSS serves mainly on routes with an average distance of 1385 km, while the truck has the mean distance approximately 100 km. Rail transport has a small part of the transport of goods in Europe. Besides, the operation of the SSS can also be beneficial to reduce the density or stagnation of the flow of loading and unloading of ships in the main harbor (Islam et al, 2011). According Schummer (1974) there are three things that make the country so large and prosperous namely: fertile land, hard work and smooth transportation.

Indonesia has two aspects first but this last aspect still needs improvement. Given the geographical condition of Indonesia is an archipelago with a coastline and the main rivers are long, and the condition of the infrastructure of roads and ports are still limited, Short Sea Shipping could be an alternative vehicle for the transportation of goods. This is in accordance with the Presidential Decree No. 26 of 2012 on the Blueprint of the National Logistics System is a development plan of activities Short Sea Shipping (SSS) as an alternative to the transport of goods efficient, timely and environmentally friendly. This type of transportation can be used as a complement to existing freight transport . This research is part of the development model of short sea shipping in Indoenesia especially on the Sumatra's island. Sumatra Island is one of the largest island in Indonesia. The model that will be developed is expected to be an example for the development of short sea shipping island - Indonesia islands. This paper aims to determine the

critical success indicators of Short Sea Shipping in other countries. The way to look back in the SSS growth in North America, Europe, Australia, and others from 2002 to 2015. These indicators can be used as a reference for the development of SSS in Indonesia.

## **2. History of Short Sea Shipping and The Determinants of Success**

The history of the definition of SSS started in 1982 which is triggered by Balduini who said that SSS is a maritime transport between ports of a nation also between the ports of a country and the ports of a country's borders. In 1993, Criley and Dean, SSS defined by a maximum size of ships up to 5000 gross weight tonnage. The same is stated by Bagchus and Kuipers (1993) which defines the SSS based on the size of the vessel. Bjornland (1993), stating that the SSS is the transportation of goods transported by sea without crossing the ocean. Marlow et al (1997), SSS is described based on technical criteria size and type of vessel, cargo transported (cargo), port, network and information systems. In the same year (1997), Stopford see SSS as a feeder service in competition with road services, and allow for the modal transfer in freight transport. According to the Committee of the European Union (1999), SSS can be defined as "Highway Transportation System Maritime" and it includes canals, rivers, other inland waterways and coastal shipping system. Transportation of, or, for inland on the river is also considered as the Short Sea Shipping (OECD, 2001). Cambridge Systematics (2004) also found Short sea shipping (SSS) is the use of boats with different types and sizes to move goods and passengers to and from a destination without passing through the ocean. SSS can be done for domestic and international trips passing through the coastline, rivers, or lakes. Yonge and Henesey (2005), incorporate elements of intermodal, feeder / feeder, inter-regional freight, transshipment, network hubs, an alternative to road transport to define SSS. US Maritime Administration (2005) defines the SSS as a commercial transportation that passes through the water that do not cross oceans. SSS transport by sea can be said that does not cross the sea. Type of marine transportation can be carried out along the coastline, between the mainland and the islands, between islands and between the mainland and the mainland (Andreasson & Liu, 2010). The movement of goods and passengers passing through shoreline / coastlines, heading to and from the island, or in lakes and rivers (Materials Management and Distribution, 2013). Research on Short Sea Shipping (SSS) was started in 2002 by Paixao and Marlow, is to evaluate the performance of SSS in Europe with methods of increasing the efficiency of goods transport system with intermodal integration, unified management system and promotion. In the next year, Harald et al (2003), conducted research examines the success factors in Europe by comparing SSS SSS with other modes. Griffin and Moore (2006), examines the potential of SSS in the US west coast. The purpose of the study was to consider the potential SSS as an alternative mode of transportation of freight to move some load trucks and trains associated with commodity export area located away from the main port and avoid any impact to the land transportation system. SSS the results show the potential to compete economically with the truck, allowing to reduce congestion along the commercial corridor of urban, regional air quality is better, and opportunities for new economic activity and efficiency along the corridor alternatives. Perakish and Denisis (2008), examines the question of multimodal transportation system that transports them through the coastal (SSS) with locations in the United States.

This study assesses the potential costs and benefits of a number of different perspectives, such as transportation costs, travel time and on-time reliability, capital investment, environmental impact, job creation and security issues. SSS offers many public benefits. Removing heavy trucks on highways to reduce congestion on major trade corridors, contributing to a decrease in road accidents on highways and improve air quality in the surrounding metropolitan area. SSS should be integrated into the intermodal transport network. In 2009, Denisis continue this research with the theme about the reliability and competitiveness of the SSS. The approach taken by combining internal operational costs with estimated external costs using fuzzy logic. The result is economic feasibility SSS. In 2010, Helen and Mary reviewing policies SSS in Australia by comparing with policies in Europe and North America. The result presents an opportunity to build an understanding of why, how and whether

short sea shipping work, and, in particular, what lessons from the Australian experience may apply to Canada and / or the context of North America and vice versa. Samsul Islam et al (2011), conduct research and development mengenai SSS in Europe and how it could be used as a sustainable and competitive alternative to moving goods. This includes a deeper analysis of the short SSS and port networks that are connected and SSS regarding potential emissions savings. SSS help reduce congestion, accidents and air pollution. Also help improve the efficiency issue in the main port of the European Union. To get the full benefits from the SSS, it must be fully integrated with other modes, such as cooperation with the trucking companies and port authorities. The research method using SWOT analysis, where the results can get this aspect of the sustainability of SSS advantages, weaknesses, opportunities, obstacles.

Research conducted by Lidija (2011) aims to determine the environmental and social benefits from the SSS (externalities) approach to the promotion and education about SSS. By the same method Niklas et al (2014), examines the challenges and opportunities of the SSS in the Baltic Sea region of Europe. The results of his research is the need for campaigns to SSS can be the choice of freight. The issue of the promotion of SSS in Europe is apparently still a bottleneck in the development of SSS. Another approach that also need attention is the problem of port charges for the SSS. These costs are influenced by the quality of port services. Research conducted by Stranden and Marlow (2014), suggest policies port charges are not based on the value of the cargo but differentiated port charges based on the quality of port services. The quality factor is the time of port services and the timeliness of handling the ship and its cargo in the port.

**Table 1. Indicators of Success SSS another country**

nation	europa	europa	Us	Us	Us	australia	europa	europa	europa
Indicator	Paixao & marlow 2002	Harald et al 2003	Griffin & moore 2006	Perakish & denisis 2008	Denisis 2009	Helen & Mary 2010	Islam 2011	lidija 2011	Stranden & marlow 2014
Policy						X			
Integration mode	X			X			X		
Integrated management system	X								
The environmental impact			X	X					
promotion	X							X	
Economic feasibility				X	X				
Sustainability							X		
port efficiency							X		
Competitiveness		X	X	X	X				
The quality of port services									X

According to the table above synthesis indicator of dominant determinant of the success in other countries is competitiveness. Meaning SSS competitive against other freight transport modes.

### 3. Competitiveness SSS

#### 3.1 Overview and Issues Freight Transport System in Indonesia

The high cost of transportation in Indonesia indicated due to the poor state of infrastructure and services. According LMFEUI (2008), truck operational costs reached US \$ 34 cents / mile. This is higher than Malaysia, Thailand, Vietnam, of which only US \$ 22 cents / mile. World Bank (2010), noted Indonesia's

logistics performance is ranked 75 of 150 countries. So, the logistics performance and competitiveness of Indonesian is low because of high transport costs and poor infrastructure. In the report the competitiveness index of the World Economic Forum (WEF) 2016-2017, placing Indonesia ranks 41, is not better than neighboring countries in ASEAN such as Singapore (2), Malaysia (25) and Thailand (34). According to ISEI 2005, generally, the condition of infrastructure in Indonesia is lagging behind compared to other neighboring countries. Recorded length of toll roads in Indonesia 570 km, Malaysia 1,230 km, whereas in China, toll roads reached more than 100,000 km. For non-toll road instead of in Indonesia reached 210 029 km by 50% is a county road, 18.96% the provincial road, the rest are national roads and city streets. Long streets built 60% in Sumatra and Java. The condition of the road network system in good condition is now reaching 54% of the existing road network. Determining the success of Short Sea Shipping in the top obtained from cases in Europe and North America. Different in Indonesia where the condition of the port infrastructure has not been too good so that the efficiency and service quality is not optimal. Integrated management system and integration of intermodal not run needs to be developed. As research Saldanha and Gray (2002), argues that the SSS should be integrated into the intermodal transport. SSS should be an integral component of the multi-modal transportation network that will be able to provide timely services that are reliable and deliver the goods to the final destination. SSS can be a competitor of road transport but SSS could be a complement of terrestrial mode. Integration mode of land and SSS can mengefisien and effective transportation of goods. The efficiency and quality of port services in Indonesia still needs to be improved. Ship unloading time (dwelling time) and waiting times for vessels led to high logistics costs. There are several factors that contribute to that quoted from the opinion of the government, the association of logistics, and the observer include:

**Table 2. Factor Dwelling Time in Indonesia**

No.	Finance Minister / Government <sup>18</sup>	Customs agency <sup>19</sup>	Indonesia Supply chain <sup>20</sup>	Association logistic Indonesia <sup>21</sup>
1	<i>pre-clearance</i>	Lartas regulations that have not been harmonized and time constraints in meeting the licensing Lartas	the speed of the flow of harbor's goods inbound	Performance port operator
2	<i>customs clearance</i>	professionalism and importers unfavorable behavior, which is regarded as a harbor warehouse	the speed of the flow of goods in ports outbound	Port access is difficult; congestion, rail port is not operational
3	<i>post clearance</i>	caretaker importers who are not professionals in the field		systems that are not integrated so that the process remains to be face to face (manual) which allows some bad actors play
4		limited land and equipment in a temporary storage area		port infrastructure
5		limitations Trucking		
6		publishing DO (delivery order), which until now carried manual penerbitan DO (delivery order), which until now done manually		
7		24/7 service is not optimal in its implementation		

Besides the issue of efficiency and quality of services at the port also needs to consider the balance problem of freight to be transported by short sea shipping (Prasad et al. 2013). The competitiveness of SSS should be backed incentives / subsidies from the government and the election of the right ships capable of pressing charges (Perkasa. 2014). Indonesian government regarding SSS program known as Toll of the Sea. This first program was launched in 2015, namely the Panjang of the port of Lampung

(Sumatra) to the port of Tanjung Perak Surabaya (Java) and instead are held three times a week. Used types of RoRo ships 15,000 GT with a travel time of 41.5 hours, 50% quicker than using land transportation that can take the travel time 90-100 hours. But the SSS program was less successful due to lack of promotion / dissemination. Route 2 was introduced in 2016, the Port of Panjang (Sumatra) to the Port of Tanjung Priok in Jakarta (Java) using the RoRo ships 12,000 GT and takes about 8 hours. The program is also less successful due to lack of promotion / dissemination and shipping schedules are fickle.

### 3.2 The competitiveness of the SSS as an alternative Freight

The success of Short Sea Shipping is determined by many factors. Committee of the European Union (1999) in its report said the SSS as a mode of sea transport alternative because it can reduce congestion and delays at road transport system, has a competitive cost than other modes such as rail and roads, shorter time to cross the straits or bays, and low air pollution caused. According Perakis et al, (2008), SSS is more energy efficient, environmentally friendly, safe and lower infrastructure costs. SSS can add capacity to existing transportation network, which is necessary to accommodate future growth in international trade with a relatively low cost. SSS can carry more than the volume of goods to other modes so lets give lower service prices (Islam et al, 2011). SSS development does not require new innovations that do not require a large investment cost compared to other modes (Paixao and Marlow, 2002). Harbor maintenance costs are also lower than the maintenance mode of land especially when looking at the costs incurred congestion and pollution, but from the side of the harbor environment and the quality of services provided by the SSS needs to get more attention. Barriers to the development of SSS is the port operations are less efficient, ship schedule is not reliable, the licensing procedure is excessive, the cost of port handling, transit time high for loading and unloading, the ship's speed is low, and an image problem, the reluctance of the sender (Perakis et al., 2008). Using more energy efficient than other modes that are more environmentally friendly (Denisis 2009). Additionally Islam et al, (2011) mentions lower CO<sub>2</sub> emissions per tonne-km as one of the great advantages of SSS. SSS CO<sub>2</sub> emissions produced by the smallest of all modes of transport. The safety factor is more secure when carrying dangerous goods. Furthermore, SSS is able to carry heavy loads that would be a problem for other modes of transport. But the issue of SSS services are limited to the port only. Not until directly to consumers. (Door to Door). With the exception of liquid and dry cargo which can be directly sent to a special terminal (Paixao and Marlow, 2002). Consequently SSS depends on cooperation with other modes to provide services door-to-door. In terms of cost, transport by road 35% cheaper than SSS and the need to use information systems to facilitate the activities of SSS. Other factors are the weaknesses SSS is the length of the ship, a living ship in the port (Arof, 2015).

Comparison of emissions generated by freight mode can be seen in the table below

**Table 3. Emissions generated by freight mode (grams / tonnes kilometers)**

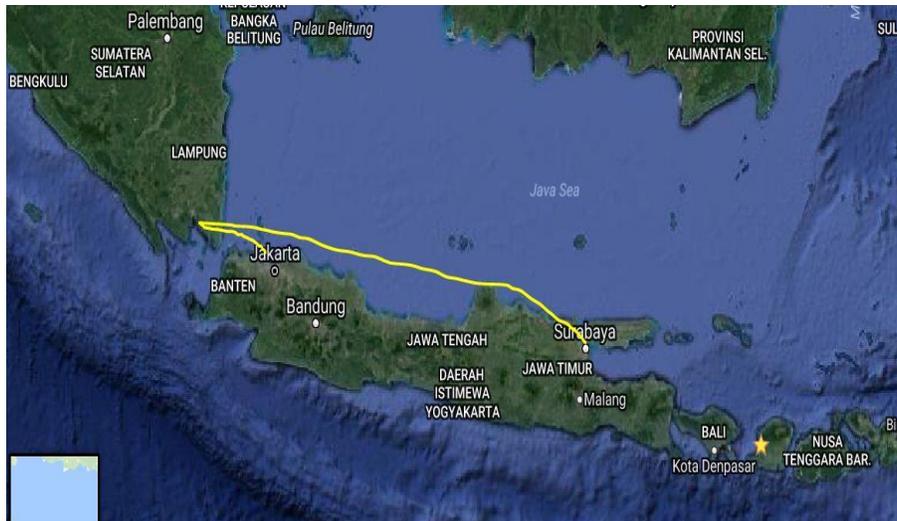
Mode	CO	HC	PM	NO <sub>x</sub>	SO <sub>2</sub>	CO <sub>2</sub>
Road	.479	.227	.078	.978	.031	98.301
Rail	.196	.098	.027	.472	.036	28.338
Short sea shipping	.036	.012	.006	.311	.290	15.450
Ocean shipping	.048	.016	.0483	.499	N.A	N.A

Source : Commission of the European Communities (1999), US Maritime Administration Cited By Leinbach and Capineri (2007), Islam et all (2011).

### 4. Prospects SSS in Indonesia

The success of Short Sea Shipping (SSS) in another country can be a model in the development of SSS in Indonesia. Competitiveness is an indicator of the dominant success of SSS in other countries. SSS managed to take market share of freight transport in Europe by 40%, while road transport to get 45%. According to the European Commission (1999), SSS serves mainly on routes with an average distance of

1385 km, while the truck has an average distance of 100 km. Based on the experience of other countries gained success indicator is the most dominant SSS competitiveness. Where Indonesia's competitiveness compared to neighboring countries is still below. Indonesia is ranked 41, is not better than in ASEAN countries such as Singapore (2), Malaysia (25) and Thailand (34). According to the WEF (2016), one of the assessment of competitiveness is the problem of infrastructure. Generally, the condition of infrastructure in Indonesia lags behind other neighboring countries (ISEI, 2005). Recorded length of toll roads in Indonesia 570 km, Malaysia 1,230 km, whereas in China, toll roads reached more than 100,000 km. SSS program in Indonesia began in 2015, there are two routes that have been run, namely:



Route	Origin	Destination	Distance (km)
1	Panjang port in Lampung (Sumatra island)	Tanjung Perak in Surabaya (Java island)	1000
2	Panjang port in Lampung (Sumatra island)	Tanjung Priok in Jakarta (Java island)	230

Source : google map

**Figure 1. Routing SSS in Indonesia**

Both routes are not run well because of lack of promotion and the tariffs charged too high so compared to other modes of transport options SSS has not become, or in other words the SSS has low competitiveness.

The results of the author's analysis based on research, there are some special characteristics that cause the high cost of transport sss in Indonesia, namely:

- Multi handling,
- Access problems to the port
- old ships and low speed,
- SSS can not “Door to door service”,
- Uncertain availability of goods/ Sustainability of goods,
- The one-stop operating system at the port is not yet running (single window), and
- Integration between modes does not exist yet

Because of the high cost of SSS, it is not the main choice of freight transport. To be able to compete with other modes need to do the efficiency at the port and at sea, so the tariff becomes cheaper.

## 5. Conclusion

Sea transport is an important means of transportation in Indonesia, which consists of many islands (Mulder and Dekker, 2016). Short sea shipping is an inter-island transport needs to be further developed to reduce the cost of logistics. The main lessons from other countries regarding SSS success indicator is the competitiveness. Especially competitive freight costs with other modes. For that it needs to be done efficiency at port and sea. Port services, ship selection, and the availability of transported goods should be optimized to reduce logistics costs. Future research agenda is to make SSS optimization model to get the minimum cost of logistics.

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