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The Economic and Maritime Impact of Indonesia's
Sea-Toll Road Program

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I don't stop when I'm tired, I stop when I'm done

Abstract

Indonesia, as the largest archipelago country in the world facing an imbalance situation whereas the 60% population and 89,12% of industries are located on the main island such as Java. This condition has caused a high disparity between Java Island and the peripheral area. To tackle this phenomenon, the Indonesia government issued the Sea-Toll Road program that has been starting since 2016. The main purpose of this project is to reduce the disparity price by reinforcing the port and logistic integration through subsidy scheme in shipping operation. And for the long term would able to boost the economic growth in remote, rural, outermost and borderland regions.

Furthermore, this research focuses on the economy and maritime industry impact of the Sea-Toll Road program. By using secondary data, government report and various academic journals, we found the parameter to measure the impact of the Sea-Toll Road in the economy and maritime industry side. Based on those data we have assed multiple case-study models to measure the Sea-Toll Road impact from the beginning in 2016 until 2019. However, we use two regions as the representative of this program as the most peripheral area in Indonesia. And also, based on data availability.

Based on the result, in general, the Sea-Toll Road generate a positive impact for the Indonesia government to reduce the disparity price for basic and essential commodities also significantly reduce the transportation cost, especially sea transportation. However, the implementation of this program still underperforming due to the limited list of goods transported, less participation and coordination of regional government, lack of industry area, and insufficient infrastructure facility.

Table of Contents

Acknowledgements.....	ii
Abstract.....	iii
Chapter 1 Introduction	1
1.1 Introduction.....	1
1.2 Sea-Toll Road Project.....	2
1.3 Research Question	3
1.4 Research Structure	4
Chapter 2 Literature Review.....	6
2.1 General Information of Indonesia’s Territory, Economic and Development Condition	6
2.2 Condition of Indonesia’s Maritime.....	9
2.3 Maritime Problem in Indonesia	11
2.3.1 Limitation of Indonesia’s Infrastructure	11
2.3.2 Price Disparity in Indonesia.....	11
2.4 Government Solution.....	12
2.4.1 Nawa Cita	12
2.4.2 National Logistic Systems	13
2.4.3 Pendulum Nusantara Network Model.....	14
2.4.4 The Sea-Toll Road Project.....	16
2.5 24 ports supporting the Sea-Toll Road Program	18
2.6 Basic and Essentials Commodities	37
Chapter 3 Methodology	38
3.1 Research Scope.....	38
3.2 Research Methodology	38
3.2.1 Public Policy Indicators	38
3.2.2 Case Study Model.....	38
3.2 Data.....	41
Chapter 4 General Condition of the Sea-Toll Road Implementation	42
4.1 Stakeholders in the Sea-Toll Road Program.....	42
4.1.1 Directorate General of Sea Transportation	42
4.1.2 Directorate General of Domestic Trade.....	42
4.1.3 Local Government	42
4.1.4 Stated-owned Company.....	43

4.1.5 Private Operator	43
4.3 Advantages of the Sea-Toll Road Program	43
4.4 Barrier of the Sea-Toll Road Program	44
4.5 Implementation of the Sea-Toll Road from 2016- 2019.....	44
4.5.1 Implementation in 2016	44
4.5.2 Implementation in 2017	46
4.5.3 Implementation in 2018	49
4.5.3 Implementation in 2019	51
Chapter 5 Result and Analysis	53
5.1 Case 1 The Sea-Toll Road Project in Natuna Island	53
5.1.2 Conclusion Report	62
5.2 Case 2 The Sea-Toll Road Project in Biak Numfor.....	63
5.2.1 Conclusion Report	69
Chapter 6 Conclusion and Recommendation.....	71
6.1 Key Findings.....	71
6.2 Study Limitations.....	72
6.3 Recommendations.....	72
Bibliography	74

Table 1 Overview of the Sea-Toll Road Budget from 2016- 2019.....	3
Table 2 Provinces in Indonesia.....	7
Table 3 Regional economic growth target from 2020 to 2024.....	8
Table 4 Indonesian Transport Share in 2018.....	10
Table 5 Overview of the Sea-Toll Road Program from 2016- 2019.....	17
Table 6 Government and institutional aspect.....	39
Table 7 Economic Aspect.....	40
Table 8 Maritime service and function	40
Table 9 Data source	41
Table 11 Advantages of the Sea-Toll Road Program.....	43
Table 12 The Declining Price of Commodities in East and West Indonesian	45
Table 13 The Declining Commodities price in the Sea-Toll Program the year 2018	50
Table 14 Price reduction in Natuna and gap price with hub-area.....	56
Table 15 Inflation and economic growth in Natuna Island.....	56
Table 16 The poverty rate in Natuna	57
Table 17 Total throuhgput from Tanjung Priok to Natuna and Natuna to Tj. Priok ..	57
Table 18 Proposal for the loading of goods from Natuna government	58
Table 19 the Shipping Tariff of the Sea-Toll Road and non-Sea Toll Road.....	61
Table 20 Result of Government and Institutional	62
Table 21 Result of economic aspect.....	62
Table 22 Resultt of maritime function and service	62
Table 23 Price reduction in Natuna and gap price with hub-area.....	66
Table 24 Inflation and economic growth in Biak.....	66
Table 25 Total loaded from Tanjung Perak to Biak and vice versa	67
Table 26 Tariff between Sea-Toll Road and non-Sea-Toll Road.....	68
Table 27 Result of government and institutional aspect.....	69
Table 28 Result of economic aspect.....	69
Table 29 Result of maritime function and service aspect.....	69

Figure 1 Logistic Cost to GDP Rasio in Asian Countries	1
Figure 2 Inter-Island Connectivity	2
Figure 3 Research Question.....	5
Figure 4 Western and Eastern region in Indonesia	6
Figure 5 Indonesia's economic and industrial growth from 2001 to 2017	8
Figure 6 Population Density in Indonesia	9
Figure 7 Domestic and International Loaded & Unloaded.....	10
Figure 8 Muntok Port Condition 2018	11
Figure 9 Majority domestic shipping routes in Indonesia	12
Figure 10 Integrated logistics and national connectivity	13
Figure 11 Indonesian Logistic Systems, modified from Logistic Blue Print.....	14
Figure 12 Pendulum Network System	15
Figure 13 Pendulum Nusantara Network.....	16
Figure 14 Pendulum Nusantara Network.....	18
Figure 15 Picture and location of Malahayati Port	19
Figure 16 Location of Port of Belawan.....	20
Figure 17 Picture and location Port of Kuala Tanjung, Batu Bara Regency	21
Figure 18 Picture and location Port of Teluk Bayur, Padang.....	22
Figure 19 Location Port of Jambi.....	23
Figure 20 Location Port of Boom Baru, South Sumatera Province	24
Figure 21 Picture and location Port of Panjang.....	25
Figure 22 Picture and location Port of Tanjung Priok, Jakarta	26
Figure 23 Picture and Location of Tanjung Perak Port	27
Figure 24 Picture and location of Tanjung Emas Port, Semarang.....	28
Figure 25 Picture and Location Port of Dwikora.....	28
Figure 26 Picture and location Port of Sampit.....	29
Figure 27 Picture and Location of Kariangau Port	30
Figure 28 Picture and location Port of Palaran	30
Figure 29 Picture and location Port of Tenau Kupang	31
Figure 30 Picture and location Port of Soekarno- Hatta.....	32
Figure 31 Location Port of Pantoloan	32
Figure 32 Picture and location Port of Bitung.....	33
Figure 33 Location Port of Kendari	34
Figure 34 Location Port of Yos Sudarso, Ambon.....	34
Figure 35 Location Port of Ahmad Yani, Ternate.....	35
Figure 36 Picture and location Port of Sorong, West Papua Province	36
Figure 37 Picture and location Port of Jayapura, Papua Province	36
Figure 38 The Sea-Toll Road Networks in 2016.....	45
Figure 39 Freight Realisation in the Sea-Toll Road Program 2016	46
Figure 40 the Sea-Toll Road Network in 2017	48
Figure 41 Freight Goes and Return in the Sea-Toll Road Program in 2017.....	48
Figure 42 the Sea-Toll Road Network in 2018.....	50
Figure 43 the Sea-Toll Road Network in 2019	51
Figure 44 Natuna Island Location.....	53
Figure 45 T-3 Route	54
Figure 46 The majority of goods shipment from Tanjung Priok to Natuna.....	57
Figure 47 The distance between Selat Lampa Port and SKPT centre	59
Figure 48 Integration between Natuna and Batam Special Economic Zone	59

Figure 49 Distance between Selat Lampa port to city centre	60
Figure 50 The location of Selat Lampa Port (Left) and Penagi Port (right)	61
Figure 51 Location of Biak Numfor Regency	63
Figure 52 T-8 route.....	64
Figure 53 Majority of goods shipment from Tanjung Perak to Biak Numfor	67
Figure 54 Distance between Biak Port to Sorong Special Economic Zone	68

Chapter 1 Introduction

1.1 Introduction

Indonesia is the largest archipelago country in the world with approximately 17.000 islands and around 40% of international trade is passing through its sea (Ministry of Transportation, 2018). Indonesia relies on sea transportation mode that is well and efficiently managed to support the regional economy that links into domestic and international trading (Hasanah, et al., 2017).

Despite the fact that Indonesia's has great potential maritime economy and industry the concentration of population and industry is not in balance, whereas the 60% population and 89.12% of industries are located in Java Island (Indonesian Bureau Statistic, 2018) . This condition is worsened by the condition of the ports and shipping in Indonesia, which are considered less efficient and improperly, resulting in high logistic cost and economic imbalance in Indonesia. For instance, the shipment to the Western remote island and the Eastern part of the country frequently experience empty or not full cargo and this situation is aggravated by extremely poor port infrastructure and facility. It showed by Katadata (2019), Indonesia is the country with the highest logistics cost in Asia with ratio about 24% of GDP.

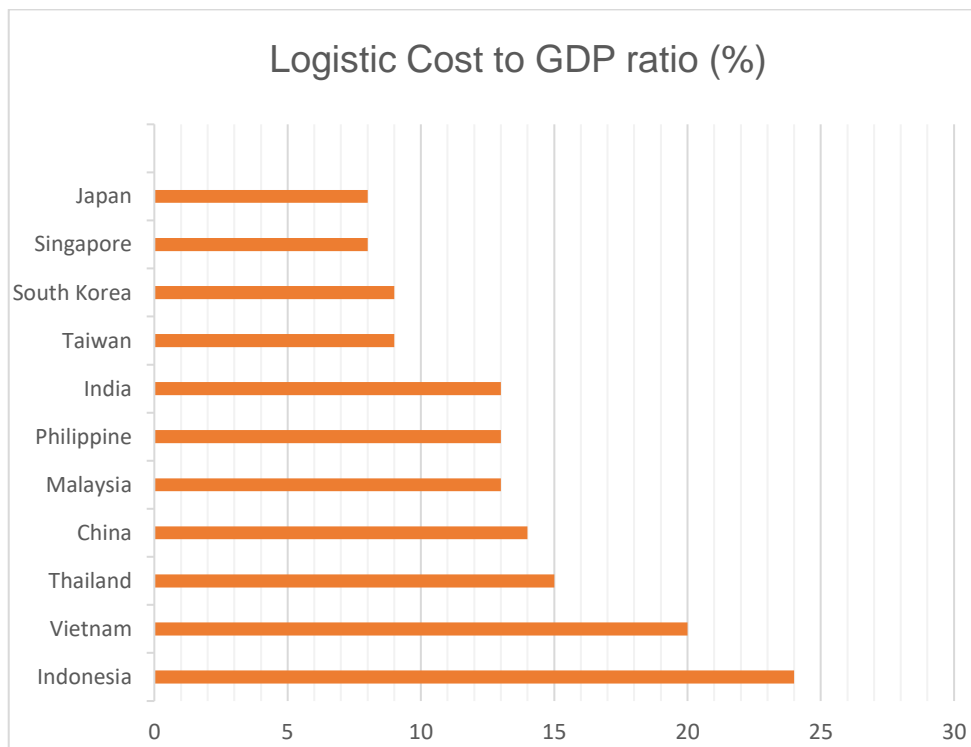


Figure 1 Logistic Cost to GDP Ratio in Asian Countries
Source: (Katadata, 2019)

Moreover, according to World Bank 2018 Logistic Performance Index (LPI), Indonesia is ranked 46th in the world, where the total score is 3.15 on a scale 1 to 5. To compare, Indonesia's closest neighbours in ASEAN, Singapore is the 7th in the world with 4.06 score and followed by Vietnam is the 39th in the world with score 3,27, and Malaysia is the 41st in the world with score 3,22. Indeed, this condition plays role in the huge disparity for logistic cost and bring the high economic disparity between Java and Indonesia's remote, rural, outermost and borderland regions.

1.2 Sea-Toll Road Project

Recently, Indonesian government under Joko Widodo decided to solve the high disparity situation by issuing The Presidential Decree Number 70 in 2017 (preceded by Presidential Decree Number 106 in 2015) which introduced the so-called Sea-Toll Road program. The aim of this policy was to bridge the discrepancy between the regions by subsidizing the logistic costs, in terms of vessel voyage costs and container costs for the shipments destined from and to places in remote, rural, outermost and borderland regions. The foremost target of this policy was to reduce the price of basic and essential commodities, while in the long-run, the government is expecting that this scheme would be able to decrease the inequality between the West and the East of Indonesia and stimulate the economy in the rural area based on its maritime potency.

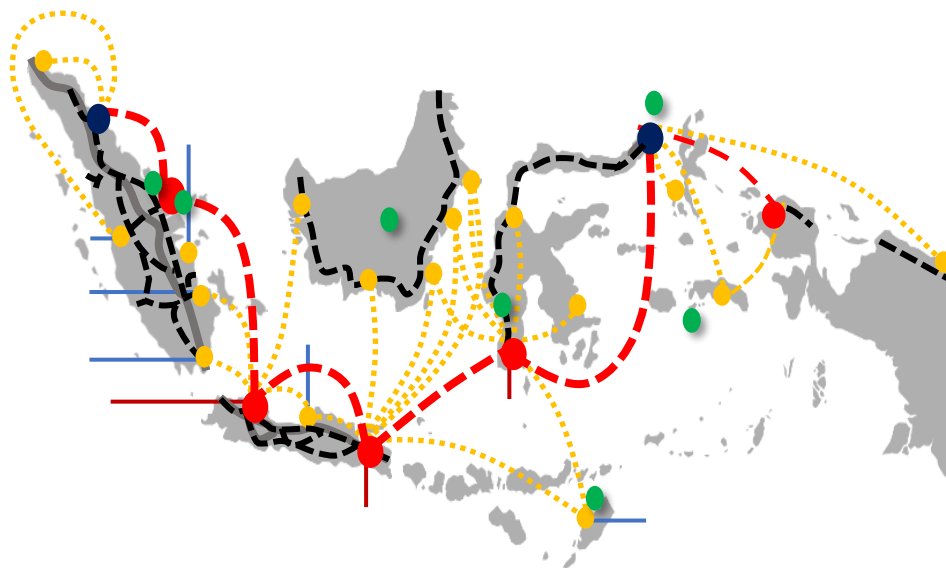


Figure 2 Inter-Island Connectivity
Source: (Directorate of Transportation, 2015)

Since the commencement of the program in 2016, the Sea-Toll Road has been persevering as one of the most ambitious programs of the government, so far, the Government, through its Ministry of Transportation has been spending its budget about Rp. 1.223.698.852.000 Billion or around 85.470.542,22 USD of its budget (Directorate General of Sea Transportation, 2018).

The Sea-Toll Road Budget				
	2016	2017	2018	2019
Budget	218.990.000.000 (Rupiah) or \$15,348,674.86 (Approximately)	335.051.237.00 0 (Rupiah) or \$23,483,387.17 (Approximately)	447.628.808.00 0 (Rupiah) or \$31,373,386.73 (Approximately)	222.028.807.00 0 (Rupiah) or \$15,561,722.17 (Approximately)

*Table 1 Overview of the Sea-Toll Road Budget from 2016- 2019
Source: (Directorate General of Sea Transportation, 2018)*

However, even the government has spent abundant money, the Sea-Toll Road might not be the most effective way to decline the logistic costs and improve the maritime and economy condition in Indonesia. It shows by Indonesian Ministry of Trade (2019) report that show this policy still has many limitations such as ineffective routes, uncertainty of vessel schedule, lack of socialisation to local government, and incompatibility of commodities based on policy.

1.3 Research Question

This research aims to analyse the impact of the Sea-Toll Road by evaluating the implementation of this program from the beginning period in 2016 to 2019. This study will take some places as the representative both West and East regions in Indonesia that served by the Sea-Toll Road program. Therefore, we will focus on the effect of this policy in economic and maritime sides in remote, rural, outermost and borderland regions, as this policy focus to decrease the commodities price and attempt to trigger the economic growth in the rural area.

To investigate the statement problem above, we set up the research question as follows:

What are the impacts of the sea toll road program to Indonesia's economy and maritime industry?

To answer this question, we further explore it into the following three sub-questions:

1. What is the history of the Sea-Toll Road Program in Indonesia?
2. What is the implementation of the Sea-Toll Road in Indonesia?
3. What are the barriers of the implementation sea-toll road program in the field?
4. How to measure the economic and maritime industry impact in the Sea-Toll Road program?

Systematically, we conclude the research question and sub-questions in Figure 3.

1.4 Research Structure

This research consists of five chapters:

- Chapter 1:** Introduction
This chapter will introduce and present about the Sea-Toll Road program in Indonesia. To further, we also provide the main and sub-research questions.
- Chapter 2:** Literature Review
This part aims to answer the sub-research questions about the historical, current implementation, barrier, and impact of the Sea-Toll Road program. This chapter is included ten sub-chapters to provide a detail knowledge and insight of Sea-Toll Road project.
- Chapter 3:** Methodology
In this chapter, we will describe the methodology model that we used in this thesis. Therefore, through the combination secondary data from government agency, state-owned company, and journals we build a case study model to measure the economic and maritime impact of the Sea-Toll Road program in Indonesia.
- Chapter 4:** General Condition of the Sea-Toll Road Implementation
This chapter will consist with the overview of the implementation the Sea-Toll Road in general from 2016 to 2019.
- Chapter 5:** Result
This chapter we attempt to answer the sub-research question about the Sea-Toll Road impact in particularly. The result is based on case study model. It will measure the impact from the beginning of this program in 2016 until 2019. Therefore, the object of this research are Natuna Island and Biak district as both are representative of western and eastern Indonesia in this program.
- Chapter 6:** Conclusion and Recommendation
This chapter we will conclude the results of the analysis. We also provide the recommendation that could be suggestion and assist the Indonesian government in improving the performance of the Sea-Toll Road project.



Figure 3 Research Question
Source: Own illustration

Chapter 2 Literature Review

In order to clearly provide the insight of the Sea-Toll Road program, the general information, national maritime condition, government solution, advantages, and potential barriers are provided in this chapter. This chapter consists of 2.1- 2.6 sub-chapters and attempt to answers all the sub-research questions that provided in Chapter 1.

2.1 General Information of Indonesia's Territory, Economic and Development Condition

Indonesia is the largest archipelago country in the world with more than 17.000 islands and three-quarter of the territory is sea, separate from Sabang, in Aceh Province to Merauke, Papua Province. This geographical area includes the coastline length around 99.093 km^2 , and the Exclusive Economic Zone (EEZ) of about 2.936 million km^2 (Iskandar, 2018).



Figure 4 Western and Eastern region in Indonesia
Source: Own illustration

Today, Indonesia consists of 34 provinces with a total population of 261.809,9 million people and Jakarta as the national capital city (Indonesian Bureau Statistic, 2018). The provinces split into two zones between the western region with 22 provinces and eastern region with 12 provinces.

No	West Province	Zone	No	East Province	Zone
1	Aceh	Western Region	18	West Kalimantan	Western Region
2	North Sumatra	Western Region	19	East Kalimantan	Western Region
3	Riau	Western Region	20	South Kalimantan	Western Region
4	West Sumatera	Western Region	21	Central Kalimantan	Western Region
5	Jambi	Western Region	22	North Kalimantan	Western Region
6	South Sumatera	Western Region	23	South Sulawesi	Eastern Region
7	Bengkulu	Western Region	24	North Sulawesi	Eastern Region
8	Lampung	Western Region	25	Central Sulawesi	Eastern Region
9	Riau Island	Western Region	26	South East Sulawesi	Eastern Region
10	Bangka Belitung	Western Region	27	Gorontalo	Eastern Region
11	Banten	Western Region	28	West Sulawesi	Eastern Region
12	DKI Jakarta	Western Region	29	West Nusa Tenggara	Eastern Region
13	West Java	Western Region	30	East Nusa Tenggara	Eastern Region
14	Central Java	Western Region	31	Maluku	Eastern Region
15	East Java	Western Region	32	North Maluku	Eastern Region
16	DI. Yogyakarta	Western Region	33	Papua	Eastern Region
17	Bali	Western Region	34	West Papua	Eastern Region

Table 2 Provinces in Indonesia
Source: (Indonesian Bureau Statistic, 2018)

Nowadays, Indonesia is the top 20 GDP countries with position in 16th with the value around \$ 1,223,809 (World Bank, 2019). Moreover, in 2017 the economic growth was 5,07% with industrial sector were risen from 4,01% to 4,74%. The trend of GDP and Industrial growth shows on figure below:

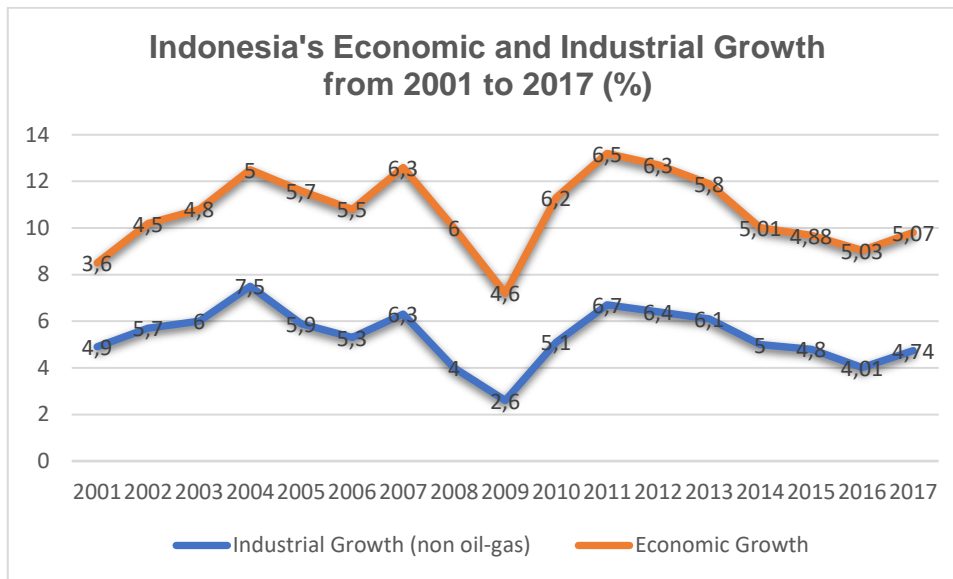


Figure 5 Indonesia's economic and industrial growth from 2001 to 2017
Source: (Indonesian Bureau Statistic, 2018)

The trend of Indonesia's economic and industrial growth around 17 years showed a positive outlook even though in some periods there is decreased. Therefore, in last 2 years, the economic growth is around 5,07 while industry sector about 4,7%.

Regional Economic Growth	Islands	Mid-term Target from 2020 to 2024(%)				
		2020	2021	2022	2023	2024
	Sumatera	4,62%	4,8%	5,2%	5,4%	5,55%
	Java & Bali	5,74%	5,9%	6,1%	6,2%	6,27%
	Kalimantan	4,08%	4,2%	4,7%	5%	5,27%
	Sulawesi	6,68%	6,8%	7,1%	7,2%	7,34%
	Nusa Tenggara	3,12%	3,5%	4,5%	5,5%	5,13%
	Maluku	6,88%	7%	7,2%	7,36%	7,47%
	Papua	7,18%	7,24%	7,47%	7,58%	7,75%

Table 3 Regional economic growth target from 2020 to 2024
Source: (Ministry of National Development Planning, 2019)

For the next mid-term development goals (RPJM 2020-2024), National GDP is projecting to increase about 6,5% in the average period 2015 to 2019. It will support by regional economic growth with around 6.39% in the next four years. Moreover, this target is based on the assumption that the Government could reach their targets like maritime infrastructure that can bridge the connectivity inter-island in widely (Ministry of National Development Planning, 2019).

Even though, Indonesia has a bright position as the potential emerging country however the government still facing a serious problem with imbalance condition in population, industry and economic distribution. For instance, 60% of Indonesian people are concentrated in Java while the rest are separated in other islands. As we can see on figure below, Java is the island with the most population in Indonesia with level of density around 3.557 per km^2 (Indonesian Bureau Statistic, 2018).

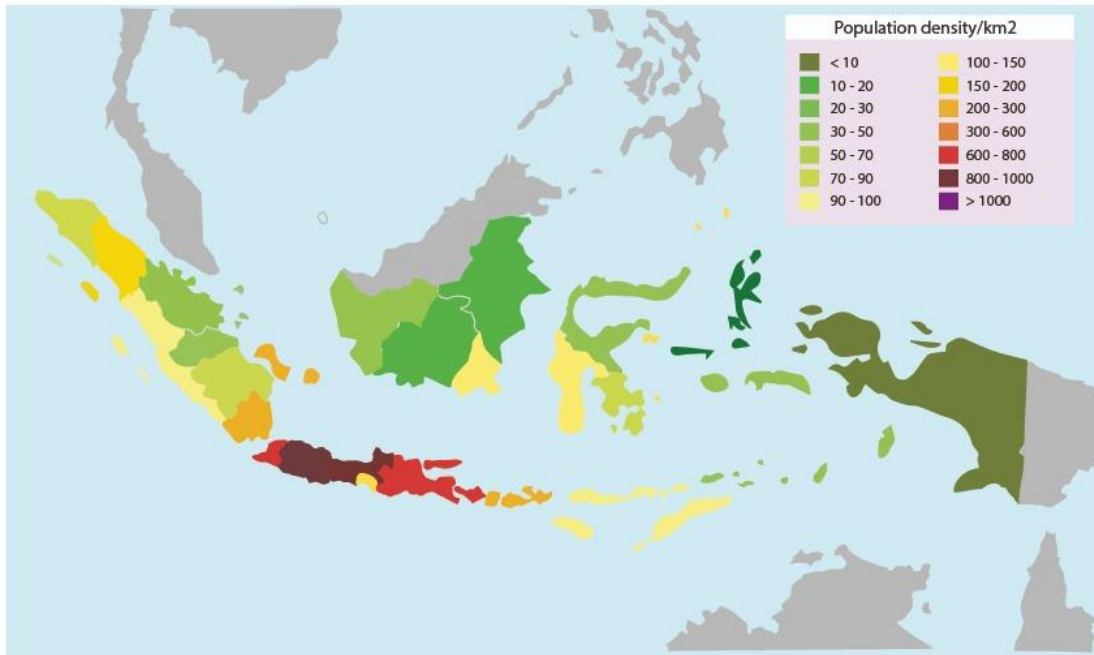


Figure 6 Population Density in Indonesia
Source: (Indonesian Bureau Statistic, 2018)

Furthermore, this condition is worsened by the inequality of economic growth and income whereas Java contributes 57,9% and Sumatera 22% while the rest of 20% comes from eastern region ((Indonesian Bureau Statistic, 2018)). For industrial sector 82% of manufacturing are settle in Java island. Linking it to maritime connectivity it is one of the major reasons why the freight from rural area experienced with empty condition. However, it is prominent for government to generate national maritime connectivity that can reach all of the region in widely. Therefore, a balance is the important key in terms to reduce national logistic cost and price disparity in rural area.

2.2 Condition of Indonesia's Maritime

According to Faisal (2015), Indonesia's geographical as archipelagic country simultaneously makes maritime transportation essential in terms to bridge the inter-island connectivity for freight moves. By contrast, the Global Competitiveness Report (GCR) data in 2018 showed that Indonesia's port service efficiency is in the position of 63th from 173 countries. This rank is far below with other ASEAN countries such as Singapore which settled in the first position while Malaysian in 17th. Moreover, the quality of sea transportation's infrastructure in Indonesia is miserable comparing with other modes quality like a road (ranked 64th), air transport (ranked 51st) and railroad (ranked 30th).

Mode	Passenger (%)	Freight (%)
Road Vehicle	84,13	91,25
Railroad	7,32	0,63
Sea	1,76	7,07
Air	1,52	0,05
Inland Waterways	0,43	0,01

Table 4 Indonesian Transport Share in 2018
Source: (Coordinating Ministry for Maritime Affairs, 2018)

In particular, this condition is not surprisingly as the utilisation of maritime transportation both for passenger and freight are very low. Based on table 4 we can see that the movement of freight almost covered by road vehicle about 91,25% while sea transportation only distributes a goods around 7,07%.

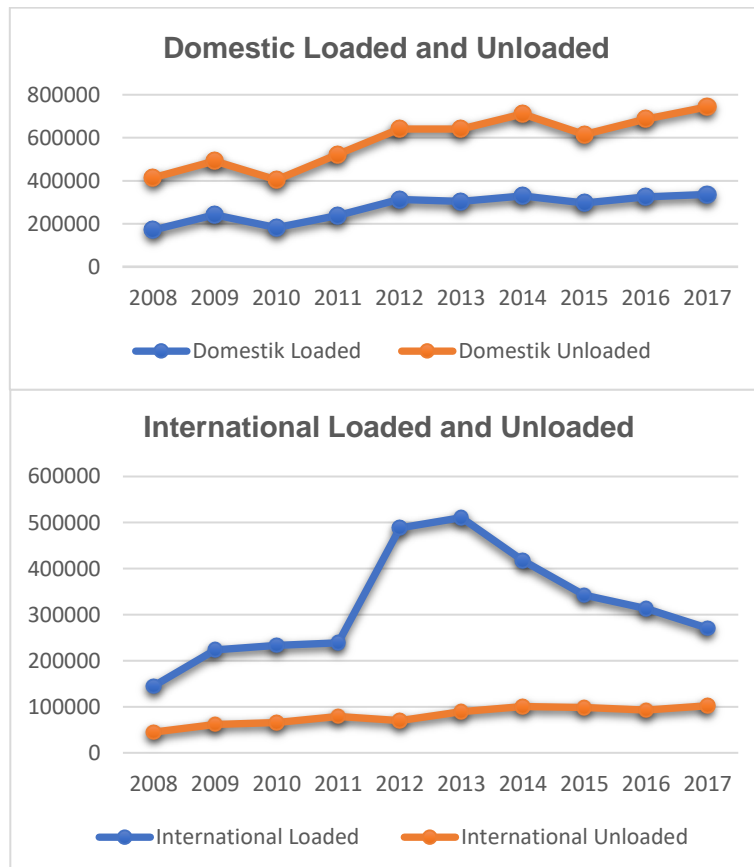


Figure 7 Domestic and International Loaded & Unloaded
Source: (Indonesian Bureau Statistic, 2017)

Furthermore, for freight trend Indonesia has a positive trend for domestic freight (BPS, 2019). On the other hand, the international freight shipment in recent years tend to fall. It happens due to some factors such as global recession, international politics, and trade war.

2.3 Maritime Problem in Indonesia

2.3.1 Limitation of Indonesia's Infrastructure

As the country with largest territory it is undoubtedly that equitable infrastructure distribution is a big challenge for government. However, one of the biggest reason high logistic cost in Indonesia is due to insufficient maritime infrastructure. Faisal (2015) explained, the poor facility such as shallow water depth and short quay length are common in most of Indonesian ports. Moreover, other modes infrastructure such as road, railway, pipeline are also far from enough to operate a minimal port level. For instance, in the case of Muntok port in Bangka Belitung Province. The port condition is extreme due to heavy sedimentation and there is no serious action to solve this situation such as dredging the port or planning a new port development. Therefore, this situation makes a bottle neck for distributing of goods. As a consequence, the inflation in Muntok, have reached about 7,78% in 2016 (Indonesian Bureau Statistic, 2018).



Figure 8 Muntok Port Condition 2018
Source: Own Data 2018

However, the inadequate port management are not happening for non-commercial port, in fact, the biggest port such as Tanjung Priok and Tanjung Perak also facing a huge problem. For example, Tanjung Priok has a problem with heavy traffic jam where this condition will delay the goods movement. On the other hand, in Tanjung Perak case, the port has a serious problem about water depth. In some cases, a large vessel needs to wait until the tide sufficient to anchor the ship (Faisal, 2015).

2.3.2 Price Disparity in Indonesia

The imbalance progress of regional development makes the sufficient infrastructure facility only available in western region especially in Java region. It proofs by two largest port like Tanjung Priok and Tanjung Perak are settled in Java. Moreover, the

shipping company are reluctant to serve remote area due to some condition such as poor port facility and extreme load factor which they frequently experienced with empty freight when they back to the origin point (Faisal, 2015).

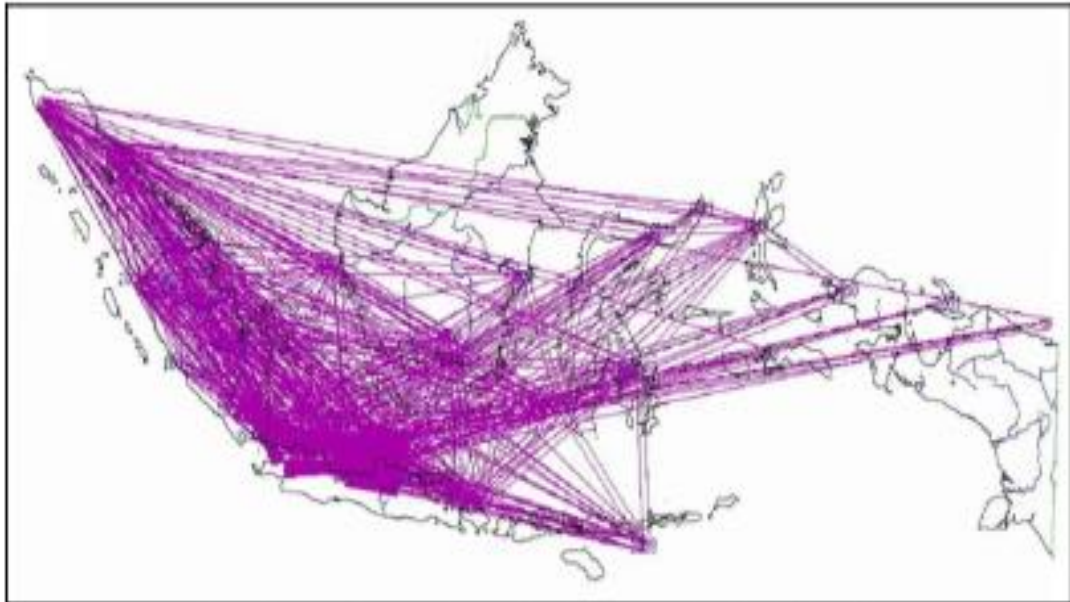


Figure 9 Majority domestic shipping routes in Indonesia
Source: (Faisal, 2015)

Based on figure above, it shows that the majority of shipping routes are dominated by shipment to western area while the line in the right (East Indonesia) rather hollow. This condition led a massive disparity price between Java Island and East Indonesia. For instance, in Papua region before the Sea-Toll Road program the price of a pack of cement could reach almost \$ 140 (Detik Finance, 2017). However, this condition also takes a place in peripheral area in western part such as Natuna and Anambas Island.

2.4 Government Solution

In order to tackle this phenomenon, Indonesia government has launched several policies that are expected to force out economic equality for all regions especially and trigger the growth in peripheral area. To further detail of those policies we will explain it more broadly in sub-chapter.

2.4.1 Nawa Cita

Nawa Cita is the nine priorities agendas that were translated into the Indonesian National Midterm Plan or RPJM Plan or RPJMN (Rencana Pembangunan Jangka Menengah), (UNDP, 2015). Through its principles every aspect of Indonesian national developing should be based on nine principles of Nawa Cita (Ministry of National Development Planning, 2015). This agenda consists:

1. State Existence to protect and provide safety for the citizen

2. Government existence in developing clean, effective, democratic and trusted governance
3. Develop country from the frontier and strengthening regions and village in Indonesia unity
4. Strong state role in reforming into a free corruption, dignity and trusted of system and law enforcement
5. Improving better human quality of life
6. Increasing people's productivity and competitiveness in international market
7. Self-reliant in economy by mobilizing strategic sector on domestic economy
8. Nation character building
9. Strengthening unity in diversity and social restoration.

Furthermore, those principles that stated the developing from peripheral regions, improving human quality life, and economic self-reliant becomes the foundation for the government to implement the Public Service Obligation (PSO) project by issued the Sea-Toll Road program for reducing the economic disparity, inequality, and trigger the economic growth which characterized as a maritime country.

2.4.2 National Logistic Systems

In term to develop well integrated logistics and network connectivity in Indonesia. The government in Yudhoyono's cabinet was launched the Presidential Decree Number 26 in 2012. This decree can be seen as a government attempt to provide a guidance for both government and private sector in building an effective and efficient national transportation system.

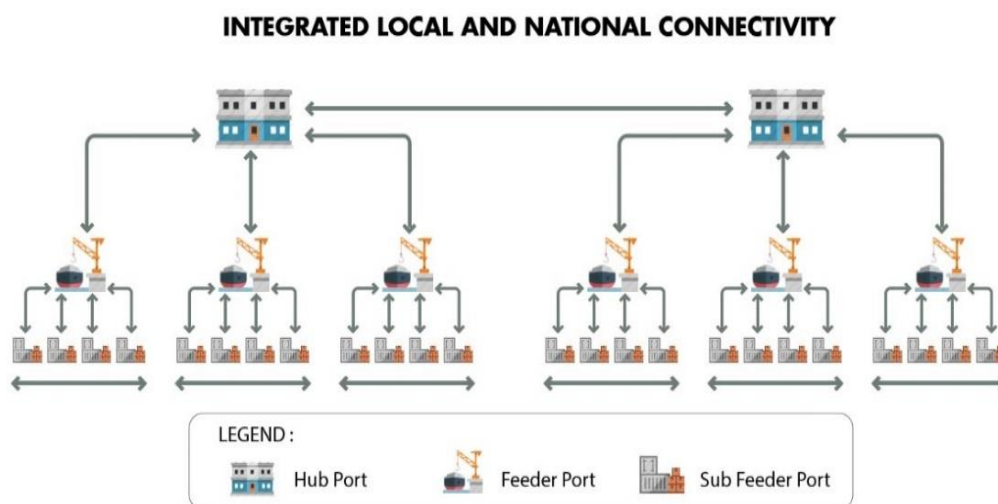


Figure 10 Integrated logistics and national connectivity
Source: Modified from (Adiliya, 2017)

The aim of the maritime transportation under this policy is to be coordinate and to synchronize the inter-islands transportation and then continue to the hub ports in the Western and Eastern regions in Indonesia (Adiliya, 2017).

Furthermore, under this regulation Indonesia has a target to achieve the logistic system which is locally integrated and globally connected for the sake of national competitiveness and social welfare. Locally integrated means that by 2025 Indonesia aims to have already achieved the integration of logistics activities from rural areas to the cities. With this vision in mind, Indonesia is moving in the right direction to experience a state of advancement for all the Indonesians in the framework of prominent maritime state. Moreover, the globally connected target is to achieve the national logistics systems by using the Indonesian National Single Window systems whereas with this program the government can realize a competitive and productive business environment within the country, so that Indonesian products are able to compete in the global market.

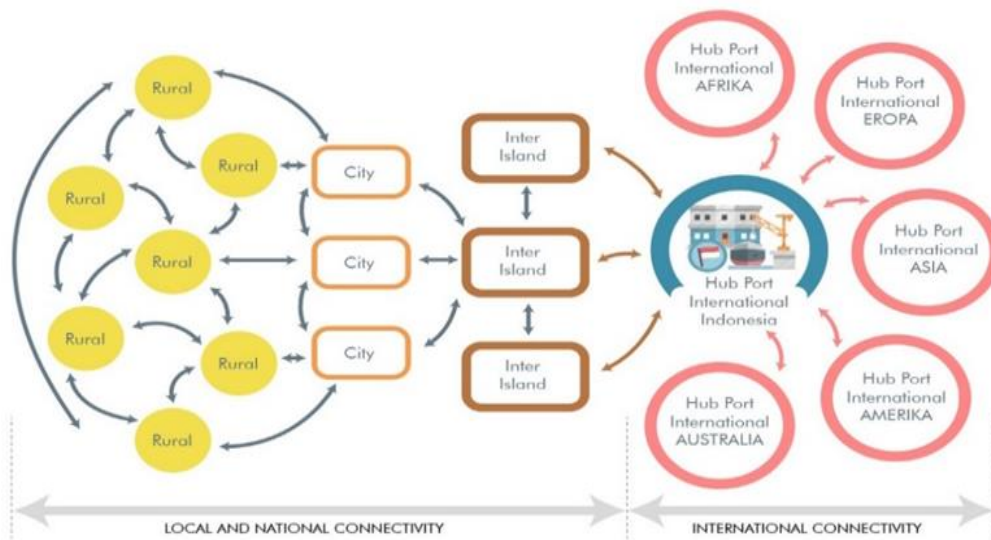


Figure 11 Indonesian Logistic Systems, modified from Logistic Blue Print
Source: (Indonesian Secretary Cabinet, 2012)

Figure 11 illustrates the national logistics systems based on the blueprint developing of national logistics systems. The system shows the connectivity of each part of Indonesia logistics chain, starting from national connectivity rural to city inter-island, to the hub port to shipping around the world.

2.4.3 Pendulum Nusantara Network Model

According to Lun & Browne (2009), the pendulum network pervades a regular itinerary between sequences of ports that serviced by geographical proximity. Several ports are serviced along one coastal area and this process is repeated on a regular basis. Pendulum model are frequently used to connect east and west trading routes, the pendulum service is based on a hub port that serves as a turning point between two distinct trades liner services and is serviced by post-panamax ships. In high-volume global trade routes such as the US West Coast-Far East-Europe trade, the design of this type of liner service has become common. As a result, a fresh generation of charging centres along the shipping routes east-west has been created over the past decade. These sites are strongly dependent on the traffic stream produced by the interaction of locations that are commonly segregated and stimulated by port place Notteboom (2004).

Furthermore, Chen & Zeng (2010) the operational feature of Pendulum network in the container shipping routes can be identified as two types relating on their operation necessity.

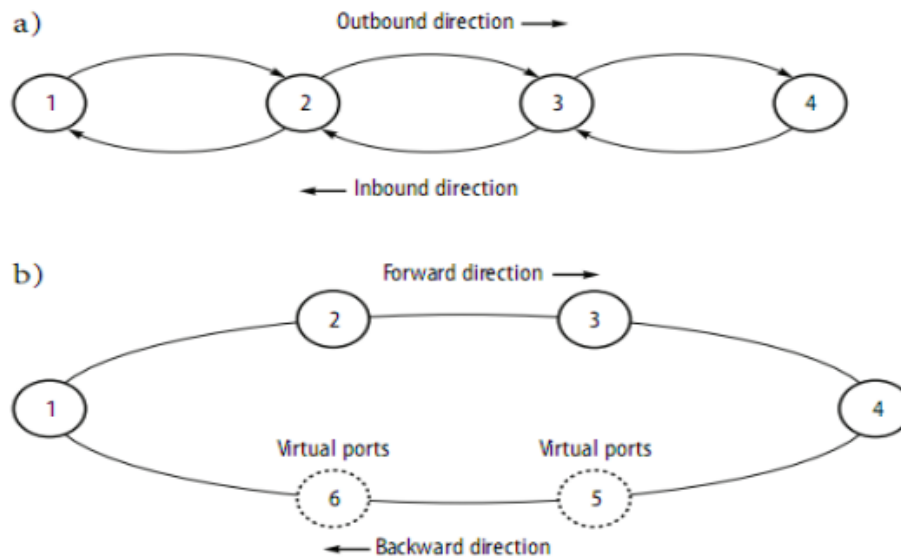


Figure 12 Pendulum Network System
Source: (Chen & Zeng, 2010)

As shown in Figure 12 in above. From the topology views, all model of pendulum network could change as a circular route by installing virtual ports in the rearward direction and building a satisfy matrix for distribution of demands.

The pendulum service involves a regular schedule between port sequences that frequently serves by geographical proximity. Several ports along one coastal area are serviced and this process is repeated regularly (Lun & Browne, 2009) . Chen & Zeng (2010) argued that container shipping networks can be distinguished into two types depending on their operating characteristics. The first is circular and the other is pendulum as shown in Figure 10. According to the Figure below, any pendulum route can be changed into a circular route as a basic form by inserting virtual port(s) in the backward direction and developing an adequate matrix for demand distributions.

As that Pendulum network are commonly built to connect between East and West Routes. In Susilo Bambang Yudhoyono's administration, Indonesian government has applied to settle down the maritime route between the western areas and eastern areas by built the Pendulum Nusantara network based on the Precedential Decree Number 26 in 2012 about the national logistic systems. Indonesian Port Company (Pelindo II) as the stated-owned company tried to develop the model with its visionary plan, they launched Pendulum Nusantara, the five-hub port network of container shipping backbone (Fahmiasari & Parikesit, 2017).

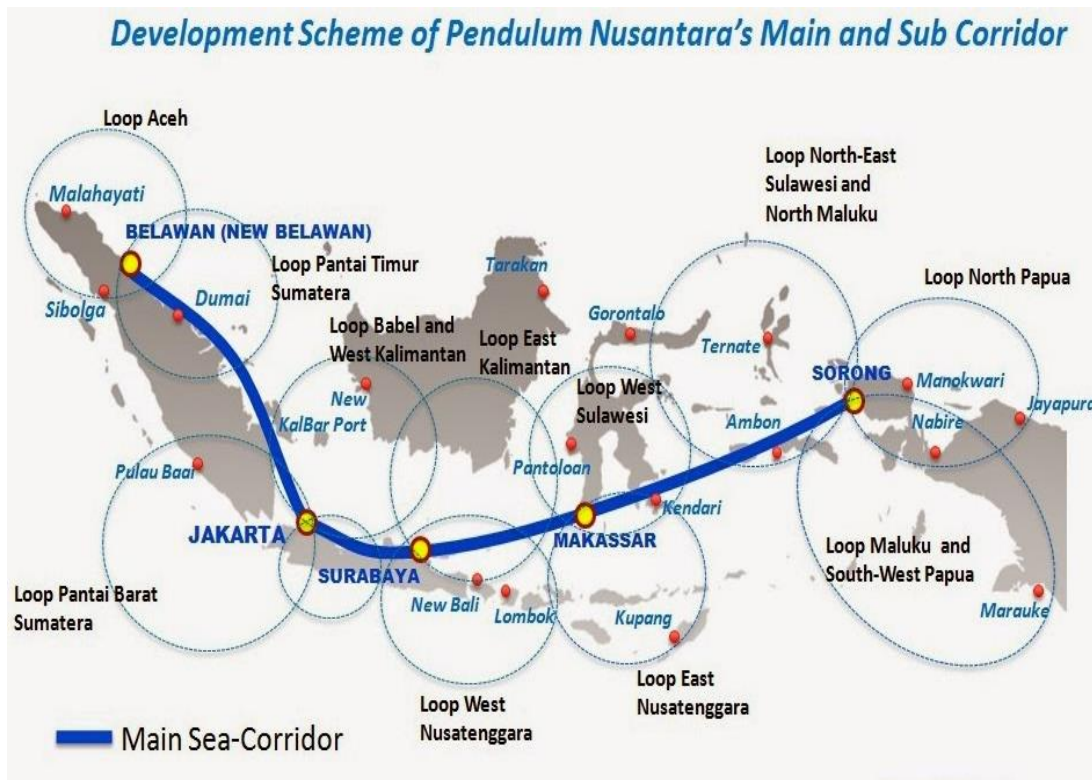


Figure 13 Pendulum Nusantara Network
Source: (Fahmiasari & Parikesit, 2017)

Based on figure above, the Pendulum Nusantara model will swing the container movement through the five hub-ports such as Belawan, Tanjung Priok, Tanjung Perak, Makassar and Sorong. Those main sea-corridors will be connected with several sub corridors which expected span remote areas.

2.4.4 The Sea-Toll Road Project

According to Directorate Transportation, Indonesian Ministry of National Developing (2015), the Sea-Toll Road is the concept of the effective maritime connectivity in order to established the regularly ship schedules from west to east Indonesia. In particular, the government conceived this network as based on Presidential Decree Number 2017 in 2017 in order to guarantee the availability of essential and basic commodities in rural area through the Public Service Obligation scheme.

Capacity/ Limitation	Sea-Toll Road Program in 2016	Sea-Toll Road Program in 2017	Sea-Toll Road Program in 2018	Sea-Toll Road Program in 2019
Fleet	6 Vessels	13 Vessels	19 Vessels	19 Vessels
Routes	6 Routes	13 Routes	18 Routes	18 Routes
Subsidy Type	Subsidy the vessel operation	Subsidy the vessel operation	1. Subsidy the vessel operation 2. Container subsidy	1. Subsidy the vessel operation 2. Container subsidy
Budget	218.990.000.000 (Rupiah) or \$15,348,674.86 (Approximately)	335.051.237.0 00 (Rupiah) or \$23,483,387.1 7 (Approximately)	447.628.808.0 00 (Rupiah) or \$31,373,386.7 3(Aproximatel y)	222.028.807.0 00 (Rupiah) or \$15,561,722.1 7 (Approximately)

Table 5 Overview of the Sea-Toll Road Program from 2016- 2019
Source: (Directorate of Sea Traffic and Transport, 2019)

Furthermore, this project has become one of the most significant maritime network projects in Indonesia, where the government is stressing a massive expansion of the capacity of this program. As shown in table 2, the number of ships and routes have significantly increased since the beginning of this project. Also, the pattern of subsidies evolves to more varied wherein 2018 there are two types of subsidies like subsidies for vessel operation and container costs, On the other hand, the budget of the project has increased remarkably from 2016 to 2018, but in 2019 the subsidy is decline around 50% from the last year.

In attempt to connect widely both west and east, Indonesia government build a huge maritime route that named the Sea-Toll Road. According to Zamal (2018), we can identify several maritime routes based on its design, such as a pendulum, circular, and butterfly. However, Indonesian Sea-Toll Road was originally the part of the pendulum network. Adliya (2017) described that the Sea Toll Road's route was constructed on the Pendulum Nusantara network that is modified in aims to reach all areas in widely. As shown on figure 4 this model relies on the effective and efficient shipping management and must be supported by hub ports and feeder ports that are well connected to distribute the goods movement from city to rural and vice versa. Moreover, for subsidy type since 2018 the government will cover the vessel operating cost and voyage container cost.

Pattern of the Sea Toll Road Route and the Subsidy model

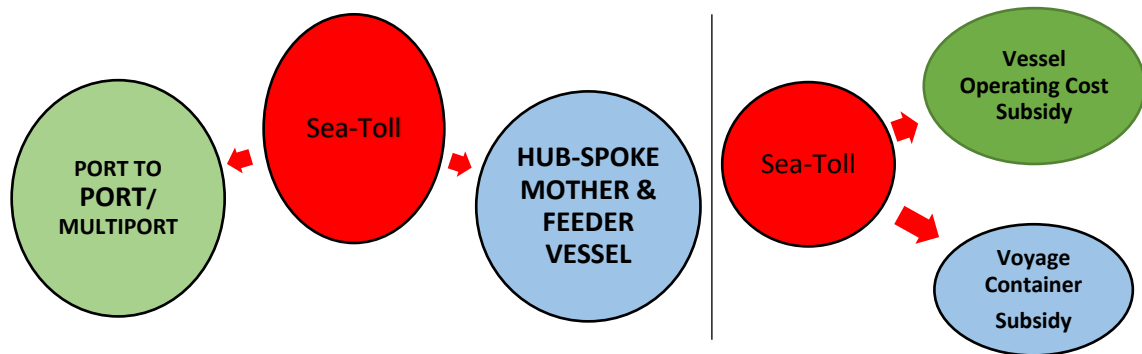


Figure 14 Pendulum Nusantara Network

Source: (Directorate General of Sea Transportation, 2018)

In implementing the subsidy scheme, basically government covers three cost of shipping cost to reduce the sea-transportation cost. The subsidy consists of:

Fix Cost	Variable Cost	Overhead Cost
Ship's crew salary	Fuel cost	5% from fix cost
Ship's crew insurance	Lubricant cost	
Meal cost	Promoting cost	
Fresh water	Port dues	
Vessel maintenance cost	Transhipment cost	
Vessel insurance		
Fumigation cost		

Table 6 Subsidy Component in Sea-Toll Road Program

Source: (Directorate General of Sea Transportation, 2018)

In particular, the Sea-Toll Road project is designed not only to fulfil the distribution goods from city to peripheral areas. This project also aims to stimulate economy in remote, rural, outermost and borderland regions by creating new industrial area through the developing of new industrial or Special Economic Zone in peripheral areas that based on maritime potency. Thus far, the Ministry of Transportation has stipulated 19 maritime routes and 24 ports to support the Sea-Toll Road project. It consists with 5 hub-ports and 19 feeder ports.

2.5 24 ports supporting the Sea-Toll Road Program

1. Port of Malayahati

Port of Malayahati is located in Aceh Besar, Aceh Province. The status of this port is fully owned and operated by PT. Pelindo 1 (stated-owned company) (PT. Pelindo 1, 2019). According to INSA (2019), Malayahati Port has a dock with a length of 384 meters and could handle three vessels with a capacity of 300 TEUs simultaneously.

This port also supported by port equipment like three forklift units and six container transport trucks. Port Malayahati is the feeder port in the Sea-Toll Road masterplan.



Figure 15 Picture and location of Malahayati Port
Source: (PT. Pelindo 1, 2019)

2. Port of Belawan

Port of Belawan known as Belawan International Container Terminal (BICT) which located in Medan, North Sumatera Province. As we can see on figure below, this port operates in Malaka Strait area. Currently, the status of Port Belawan is the commercial port that fully owned and operate by PT. Pelindo 1 (state-owned company). The BICT infrastructure is consist with draught of 10 meters and total berth length of 550 meters. The slot capacity is around 15,726 TEUS with 16 Ha of total area (PT. Pelindo 1, 2019). This port plays a role as a hub-port in western region under the Sea-Toll Road scheme (Directorate of Transportation, 2015).



Figure 16 Location of Port of Belawan
Source: Google maps

3. Port of Kuala Tanjung

According to PT. Pelindo 1 (2019), Kuala Tanjung Port is the port that located in Batu Bara, North Sumatera Province. This port is a new port which started ground breaking in 2015. The status of Kuala Tanjung is owned by PT. Pelindo 1 (state-owned company). This port is integrated with Sei Mangkei Special Economic Zone (SEZ). In the next year, Kuala Tanjung could handle around 60 million TEUs of container per year. In the Sea-Toll Road program Kuala Tanjung Port plays a role for international hub-area in order to export the goods from western peripheral area.



Figure 17 Picture and location Port of Kuala Tanjung, Batu Bara Regency
Source: (PT. Pelindo 1, 2019)

4. Port of Teluk Bayur

Teluk Bayur is the port that located nearby India Ocean. For the status this port is fully owned and operated by PT. Pelindo 2 (state-owned company). This port consists of 1.565 meters of berth length, 30,89 Ha of harbour pound, 1,608 M² of passenger terminal with total area around 544 Ha (PT. Pelindo 2, 2019).



Figure 18 Picture and location Port of Teluk Bayur, Padang
Source: (PT. Pelindo 2, 2019)

that located in Padang, West Sumatera Province. For the status this port is fully owned and operated by PT. Pelindo 2 (state-owned company). In the Sea-Toll Road program Teluk Bayur port is one of feeder port to support the operation of Sea-Toll Road in western area.

5. Port of Batu Ampar

According to Batam Authority (2019), Port of Batu Ampar is owned by Batam Authority. For the operation, Batam Authority is jointly operated with PT.Pelindo 1. The main purpose of this port is container terminal. This port has a strategic location which nearby Malaka Strait, Port Klang, Malaysia, and Port of Singapore. Currently, the status of Batu Ampar plays a role as feeder port to support the goods distribution in Riau's Remote Island such as Natuna and Anambas Island.



Figure Location Port of Batu Ampar
Source: Google maps

6. Port of Jambi

Port of Jambi is one of inland waterways port which located in Batang Hari River. This port is fully owned and operated by PT. Pelindo 2 (state-owned company). Port of Jambi is a feeder port to support the operation of Sea-Toll Road program (Directorate of Transportation, 2015).



Figure 19 Location Port of Jambi
Source: Google maps

7. Port of Boom Baru

Port of Boom Baru is located on the Musi River with a distance of 108 km from the mouth of the upstream river. From the geographical this port is under South Sumatera Province. This port is fully owned and operated by PT. Pelindo 2 (state-owned company). This port consists of 300 meters of berth length, and warehouse with total area 8.937,3 M². Boom Baru is a feeder port in Sea-Toll Road masterplan.



Figure 20 Location Port of Boom Baru, South Sumatera Province
Source: Google map

8. Port of Panjang

Port of Panjang is located nearby Sunda Strait which under administrative of Lampung Province. This port is owned and operated by PT. Pelindo 2 (state-owned company). There are six docks with total of berth length around 736 meters and 26,640 m³ of warehouse capacity (PT. Pelindo 2, 2019). The status of Port of Panjang in the Sea-Toll Road program is a feeder port (Directorate of Transportation, 2015) .



Figure 21 Picture and location Port of Panjang
Source: (PT. Pelindo 2, 2019)

9. Port of Tanjung Priok

Located in North Jakarta, Tanjung Priok is the largest and busiest commercial port in Indonesia. This port handles more than 30% of Indonesia's Non-Oil and Gas commodities, besides that 50% of all goods flowing in and out of Indonesia through this port (PT. Pelindo 2, 2019) . Currently the total area of Tanjung Priok port is 80 hectares with the container yard slot about 30,476 TEUs. There are four terminals that could serve container cargo, liquid bulk, dry bulk and break bulk. As the largest port in Indonesia, Tanjung Priok has been able to serve direct calls to various international trade centres (PT. Pelindo 2, 2019). In supporting the Sea-Toll Road program, Port of Tanjung Priok plays a role as a hub to serve western area of Indonesia (Directorate of Transportation, 2015).



Figure 22 Picture and location Port of Tanjung Priok, Jakarta
Source: (PT. Pelindo 2, 2019)

10. Port of Tanjung Perak

Located in East Java, Tanjung Port is the second largest and busiest commercial port in Indonesia. The position of this port is nearby of Madura Strait. This port has five terminals. For Jamrud Terminal, Nilam Terminal, Mirah Terminal, Berlian Jasa Terminal are fully owned and operated by Pelindo 4 (state-owned company). While, Petikemas Surabaya Terminal is jointly operated with Dubai Port World (DPW) (PT. Pelindo 3, 2019). In the Sea-Toll Road program, Tanjung Perak port is the hub-area for eastern Indonesia (Directorate of Transportation, 2015).



Figure 23 Picture and Location of Tanjung Perak Port
Source: (PT. Pelindo 3, 2019)

11. Port of Tanjung Emas

Tanjung Emas is a port that located in Semarang, Central Java Province. The status of this port is fully owned and operated by PT. Pelindo 3 (state-owned company). Currently, there are six docks in Port of Tanjung like Dermaga Samuder, Dermaga Nusantara, Dermaga Dalam 1, Dermaga Dalam 2, Dermaga Dalam Multipurpose, Dermaga CPO, Dermaga Curah Cair. This port consists of 9,9 Ha of standing field, 10,060 M² of warehouse, 4,500 M², and 1,1 Ha of Parking area. Therefore, for the shipping flow it includes 2,5 nautical miles of flow length, 100 M of flow width, and dept flow -10 MLWS. In the Sea-Toll Road Program, Port of Tanjung Emas status is a feeder port (Directorate of Transportation, 2015).



Figure 24 Picture and location of Tanjung Emas Port, Semarang
 Source: (Darilaut.id, 2019)

12. Port of Dwikora

Port of Dwikora is located in Pontianak, West Borneo Province. This port is owned and operated by PT. Pelindo 2 (state-owned company). This port consists of 256 meters of berth lengths, 1,095 M² of stacking yard, and 600 M² of warehouse (PT. Pelindo 2, 2019). According to Directorate of Transportation, Ministry of National Development Planning (2015), Port of Dwikora is one of feeder port in the Sea-Toll Road master plan.



Figure 25 Picture and Location Port of Dwikora
 Source: Google maps

13. Port of Sampit

Port of Sampit is located in Kotawaringin Timur, Central Kalimantan Province. This port is operated and owned by PT. Pelindo 3 (state-owned company). This port is consist with 2,54 Ha of stacking yard, 2,616 M² of warehouse, 2 unit container crane, 1 unit mobile crane, 1 unit reach stacker, and with 2 units of forklift (PT. Pelindo 3, 2019). The purpose of this port in Sea-Toll Road masterplan as a feeder port (Directorate of Transportation, 2015).



Figure 26 Picture and location Port of Sampit

Source: (PT. Pelindo 3, 2019)

14. Port of Kariangau

Port of Kariangau is located in Balikpapan, East Kalimantan Province. This terminal is a consortium port between central government and PT. Pelindo 4. This port is a multipurpose port which serve container, liquid bulk, and dry bulk. PT. Pelindo 4 is the single operator in this location. The facility of this port consists of 270 meters of berth length, 6 Ha of stacking yard, 2 container cranes, 1 reach stacker, and 7 forklifts. Based on Directorate Transportation Ministry of National Development Planning (2015) this port plays a role as a feeder port.



Figure 27 Picutre and Locatipn of Kariangau Port
 Source: (PT. Kaltim Kariangau Terminal, 2019)

15. Port of Palaran



Figure 28 Picture and location Port of Palaran
 Source: (TPK Palaran, 2019)

According to TPK Palaran (2019), Port of Palaran is located in Samarinda, East Kalimantan Province. This port is consortium between PT. Pelabuhan Indonesia 4 and PT. Samudera Indonesia. The infrastructure of this port consists of 6 meter of water dept, 1200 meters of river width, 270 of wharf length 87,000 m2 of container yard, and 3,353 m2 of container freight station (TPK Palaran, 2019). The position of Palaran Port is a feeder port in the Sea-Toll Road program (Directorate of Transportation, 2015).

16. Port of Tenau

Port of Tenau is located in Kupang city, Nusa Tenggara Timur Province. This port is owned and operated by PT. Pelindo 3 (state-owned company). This port is the one of main port in Nusa Tenggara region. The facility of this port consists of 5 docks, 3 Ha of stacking yard, warehouse, 36 of reefer plugs, 1 unit of shore carne, 1 unit of mobile crane, and 1 unit of forklift (PT. Pelindo 3, 2019). The status of this port is a feeder port, under the Sea-Toll Road scheme (Directorate of Transportation, 2015).



Figure 29 Picture and location Port of Tenau Kupang
Source: (PT. Pelindo 3, 2019)

17. **Port of Soekarno- Hatta**

Port of Soekarno- Hatta is located in Makkasar, South Sulawesi Province. Operated and owned by PT. Pelindo 4 (state-owned company), this port becomes a largest port in East Indonesia. The infrastructure consists of 2 wide quays with 2210 meters of length and the depth level is vary between 9 to 12 meters. This port is able to connect with all regions in Eastern Indonesia. As the largest port in Eastern Indonesia, the government stipulates Port of Soekarno- Hatta is a hub-port in the Sea-Toll Road scheme (Directorate of Transportation, 2015).



Figure 30 Picture and location Port of Soekarno- Hatta
 Source: (Bisnis.com, 2019)

18. Port of Pantoloan

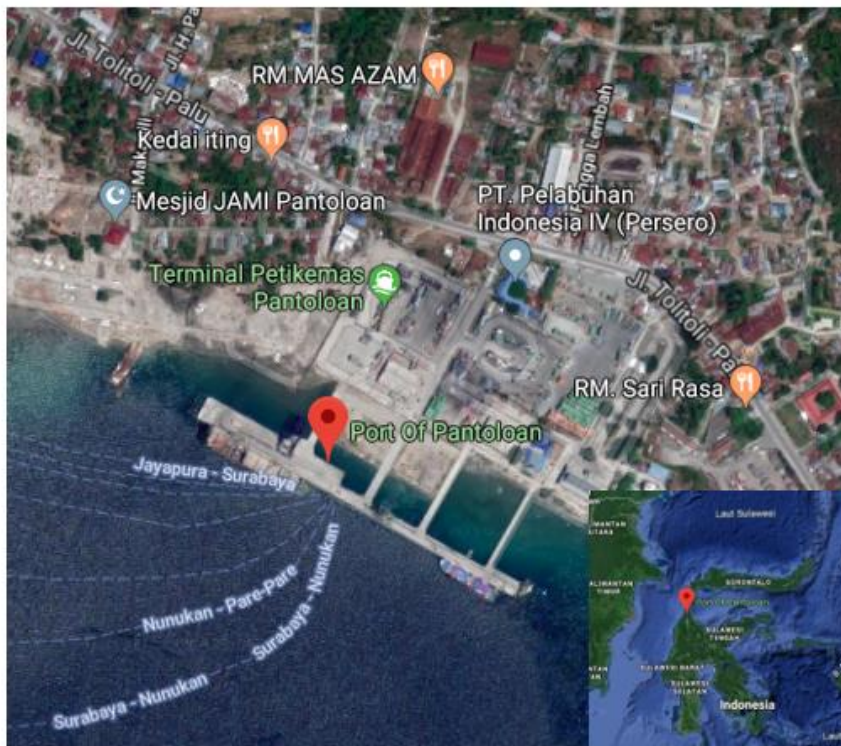


Figure 31 Location Port of Pantoloan
 Source: Google maps

Port of Pantoloan is located in Palu, Central Sulawesi Province. This port is owned and operated by PT. Pelindo 4 (state-owned company). Since 2014, the Government has established the Pantoloan Port as the National Logistics and Goods Center. The current status of this port is an international port and this port is integrated with Palu Special Economic Zone (PT. Pelindo 4, 2019). Pantoloan port plays a role as a feeder port in the Sea-Toll Road program (Directorate of Transportation, 2015).

19. Port of Bitung



Figure 32 Picture and location Port of Bitung
Source: (Berita Trans, 2019)

Port of Bitung is the second largest port in eastern Indonesia. This port is owned and operated by PT. Pelindo 4 (state-owned company). The status of this port is an international port which integrated with Bitung Special Economic Zone (SEZ). As an international port, Bitung port can deliver the goods directly to international market. The infrastructure of this port consists of 2 docks, 1 unit of container crane, 2 unit reach stackers, 5 head trucks, 4 forklifts, and 1 unit of the mobile crane. In the Sea-Toll Road scheme, this port has a position as a hub-port in the eastern area (Directorate of Transportation, 2015).

20. Port of Kendari

Port of Kendari is located in Kendari, Southeast Sulawesi Province. This port is owned and operated by PT. Pelindo 4 (state-owned company). There are 3 berths such as Dermaga Nusantara, Dermaga Pertamina, and Dermaga Jetty. This port is a multipurpose port which serves container, liquid bulk, and dry bulk. Currently, Port of Kendari is a part of feeder port for the eastern region under the scheme of Sea-Toll Road program (Directorate of Transportation, 2015) .

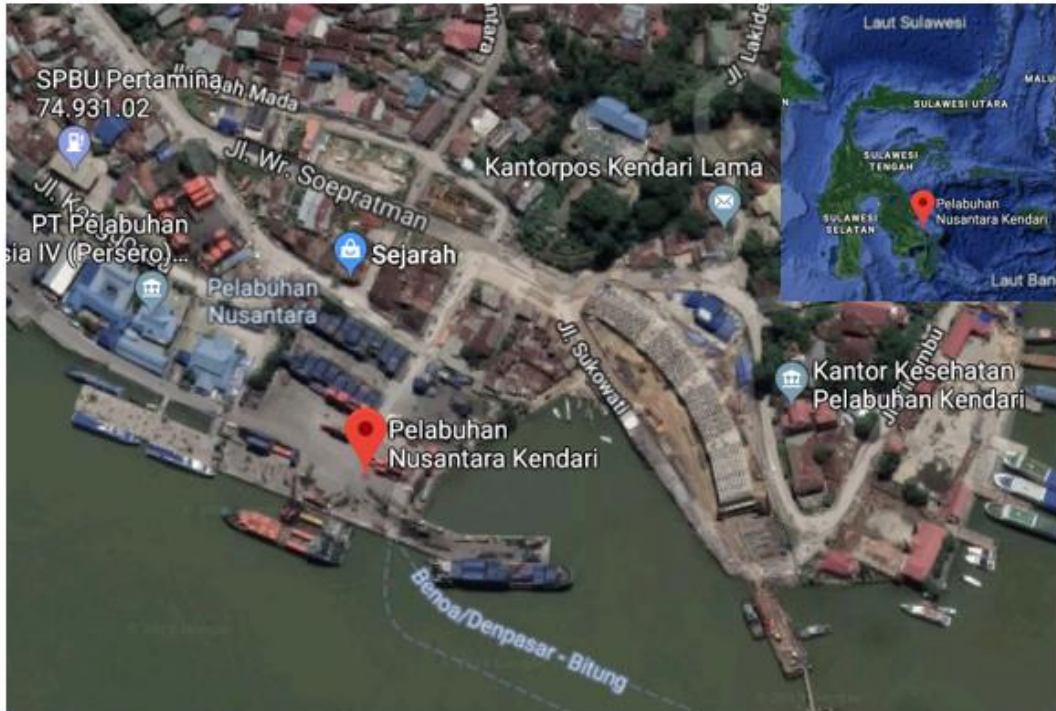


Figure 33 Location Port of Kendari
Source: Google maps

21. Port of Yos Sudarso

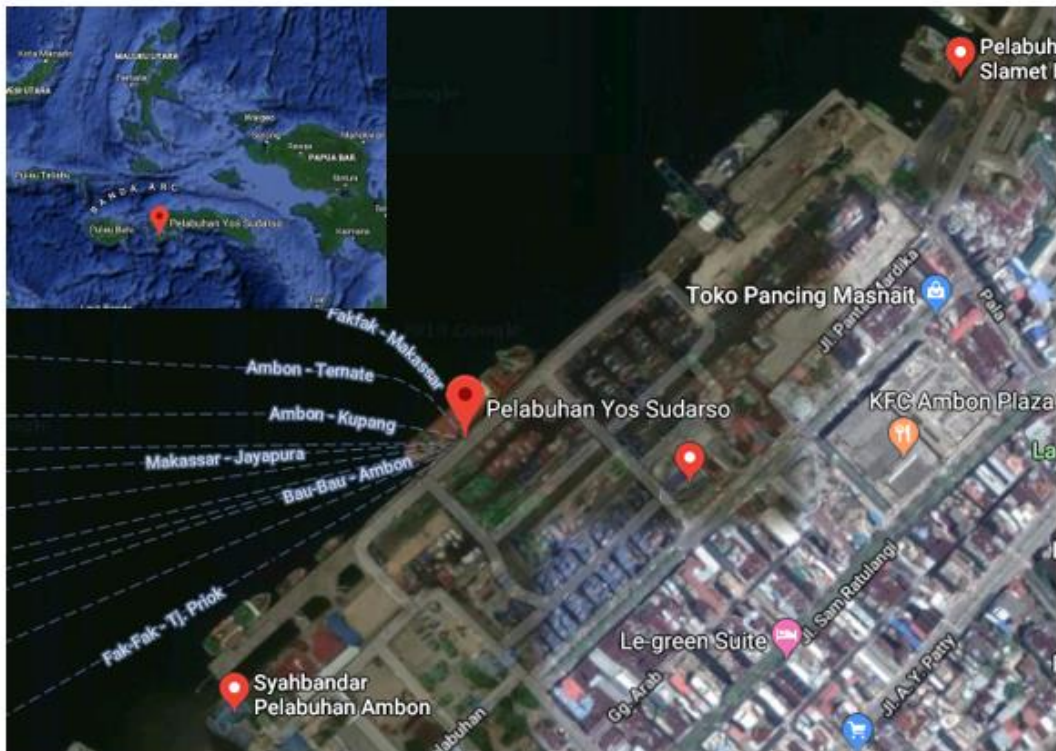


Figure 34 Location Port of Yos Sudarso, Ambon
Source: Google maps

Port of Yos Sudarso is located in Ambon, Maluku Province. This port is owned and operated by PT. Pelindo 4 (state-owned company). There are 5 berths such as Dermaga Yos Sudarso, Dermaga Siwabessy, Dermaga Slamet Riadi, and Dermaga Bandanaira. This port is consist of 1 unit of the crane, and 5 unit of forklifts. Currently, Port of Yos Sudarso is a part of feeder port in term to support the Sea-Toll Road program (Directorate of Transportation, 2015).

22. Port of Ahmad Yani

Port of Ahmad Yani is located in Ternate, North Maluku Province. with 5 berths like Dermaga Ahmad Yani, Dermaga Sheet 1, Dermaga Sheet 2, Dermaga Bastiong, and Dermaga Perikanan. This port is consists of 1 unit of forklift with 5 tons capacity. This port includes as a feeder in the Sea-Toll Road program (Directorate of Transportation, 2015).

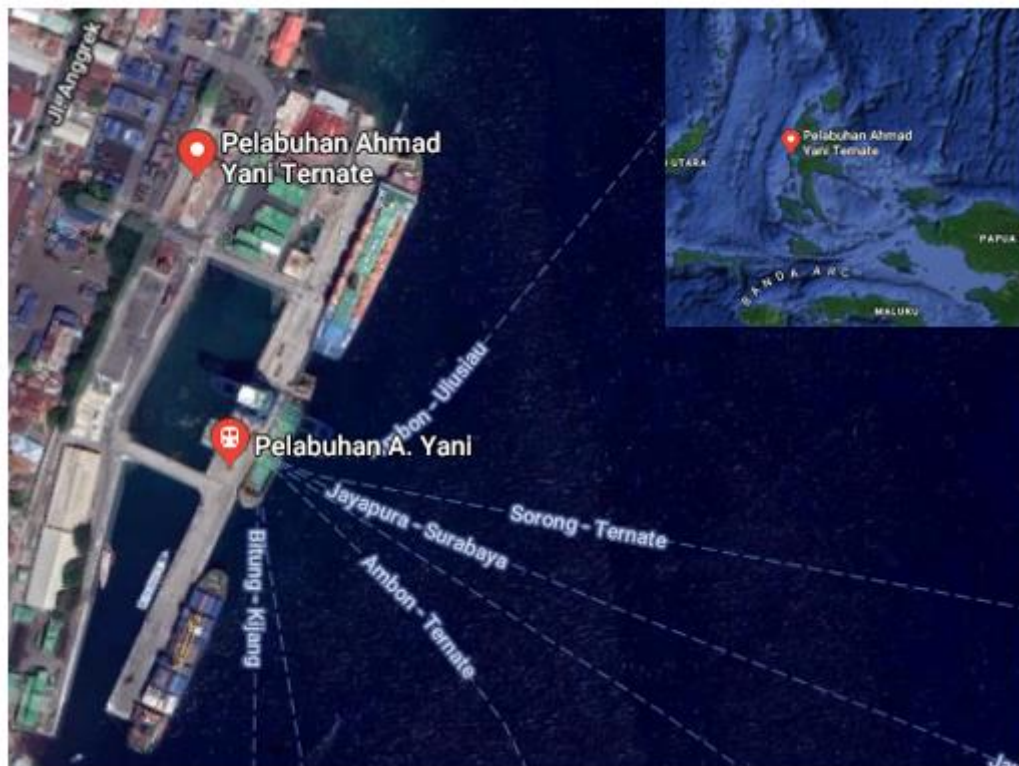


Figure 35 Location Port of Ahmad Yani, Ternate
Source: Google maps

23. Port of Sorong

Port of Sorong is located in Sorong, West Papua Province. This port is owned and operated by PT. Pelindo 4 (state-owned company). This port includes 3 docks like Dermaga Sorong, Dermaga Minyak, and Dermaga Doom. Moreover, the equipment consists of 1 unit of mobile crane, 1 unit of truck loader crane, and 2 units of forklifts. Sorong port is a hub-port in Papua regions to support the Sea-Toll Road operation in all Papua Regency (Directorate of Transportation, 2015).



Figure 36 Picture and location Port of Sorong, West Papua Province
Source: (Kataomed, 2019)

24. Port of Jayapura



Figure 37 Picture and location Port of Jayapura, Papua Province
Source: (Kabar Papua, 2019)

Port of Jayapura is located in Jayapura, Papua Province. This port is owned and operated by PT. Pelindo 4 (state-owned company). This port includes 4 and the equipment consist of 1 unit of crane and 2 units of forklifts. Port of Jayapura's status.

2.6 Basic and Essentials Commodities

As the main point of Article 1 (Presidential Decree Number 70 in 2017), one of the goals of the Sea-Toll Road program is reserved the distribution of basic and essentials commodities. Moreover, Business Dictionary (2019) explained that basic commodities are *“a physical item required by a consumer in order to sustain health or life such as flour, oil, and dairy products. On the other hand, the essential commodities essential good types that are produced by business operators include food, water, gasoline and heating fuel, as well as residential building materials that can be used to construct homes for shelter.*

However, the Presidential Decree Number 70 in 2017 defines basic commodity is defined as the goods that are related to basic people necessities while essential commodity is the strategic goods that support the national development. In accordance with this regulation, government stipulates consist of:

1. Basic commodities
 - A. Agricultural Products
 - 1) Rice
 - 2) Soy
 - 3) Chili
 - 4) Onion
 - B. Industrial Products
 - 1) Sugar
 - 2) Vegetable oil
 - 3) Flour
 - C. Livestock and fishery Products
 - 1) Beef
 - 2) Chicken
 - 3) Eggs
 - 4) Fish
2. Essential goods
 - 1) Grains (rice, corn, and soybeans)
 - 2) Fertilizer
 - 3) Plywood
 - 4) Cement
 - 5) Steel
 - 6) Iron

Chapter 3 Methodology

3.1 Research Scope

This research, in particular, wants to describe the impact of the Sea-Toll Road program in the economic and maritime industry in the last three years. To answer sub-research questions about the historical, implementation and barriers of this policy we will decipher it through some academic journals and government reports in term to find an excellent result. Two objects are selected as the representative both west and east region that served by the Sea-Toll Road program. Afterwards, we choose the Natuna island as a representative of the western part while Biak Numfor as a representative of the eastern region.

In order to conclude the main sub-research question "*How does the Sea-Toll Road Program impacts to Indonesia's economic and maritime industry?*" the case study analyses are required. This research will be described by three aspects of the impact of the Sea-Toll Road program. It also combined with several indicators that selected based on Islamy (1986) explanation.

3.2 Research Methodology

3.2.1 Public Policy Indicators

Policy analysis is the process or activity of synthesizing information, including research results, to produce recommendations for public policy design options (Vitasari, 2017). While policy evaluation is an activity to conduct an assessment of the effects or impacts of policies from various government programs (Islamy, 1986). Characteristics of public policy (Vitasari, 2017):

1. Policy analysis is a process or activity "synthesis" of information which means the process of scouting various information, including research results in order to find the effective policy.
2. The main source of information is from the results of research combination.
3. The output of policy analysis is a decision or design choice recommendation
4. Clients of policy analysis are public policy decision makers and

Furthermore Islamy (1986) stated, the indicators of the impact of a public policy can be seen from the purpose, results and consequences of implementing the program. Linking this theory to our model assumption. We will select several indicators into three aspects of the impact of the Sea-Toll Road program based on the government report and academic journal.

3.2.2 Case Study Model

As our research aims to analyse and evaluate the impact and performance of the Sea-Toll Road program result toward economic and maritime industry condition based on the qualitative method. We would use the case study model as our main research method. Basically, Case study is an imperative method to develop and evaluate a

program (Baxter & Jack, 2008). By using the model of case study, the object that we observe can be very detail with precious data in comprehensively (Easton, 1998).

Furthermore, as this study is select more than single period which from the beginning of the Sea-Toll Road program in 2016 until the latest in 2019. The multiple-case study is required according to Baxter and Jack (2008). In term to develop tremendous evaluation, Yin (2009) explained it is indeed to combine a theoretical framework that builds by many information, research, and literature review as the great step to analyse this model. Each case study should show the detail analysis of every aspects in the Sea-Toll Road program like government and institutional and economic aspect. Moreover, the impact of the Sea-Toll Road program from each period will be compare in the end of this study. And will guide us to find the result and conclusion of this project.

However, Reis (2009), stated there some limitation in case study model. For most case studies, a large amount of data collection and analysis would be necessary which could cause researchers concerns for the time and scale of the project. And the findings of case studies would only portray the facts and the situation rather than offer additional forecast or instruction Reis (2009).

In term to asses and evaluate the Sea-Toll road impact accurately, we choose several indicators based on secondary data and literature review to develop a robust case study model. There are some indicators in three aspects in term to find the impact such as policy effectiveness, price disparity, inflation, freight return, and logistic and port integration.

In this table below we will give an example of the evaluation table based on three aspects in order to evaluate and measure the Sea-Toll Road program:

1. Government and institutional aspect

	Policy quantity	Policy effectiveness	Policy coverage	Policy supervision
Sea-Toll Road in Natuna				
Sea-Toll Road in Biak				

Table 7 Government and institutional aspect
Source: Own elaboration

In aspect of Government and institutional aspect we developed this model based on the Hong's (2018) research model. The purpose of model was built in order to evaluate the policy from government, political or institutional aspect with four indicators. Originally, the indicator was used to see the impacts of Maritime Free Trade Zone in China. Thus, based on this foundation we attempt to analyses the impact of the Sea-Toll Road from

government aspect by this model. For the result, the effectiveness, coverage, and supervision represent success if those indicators are proven well for achieving the target. However, if there is a limitation or ineffectiveness, it shows that the policy still underperforms.

2. Economic aspect

	Price disparity	Inflation rate	Economic Growth	Poverty rate
Sea-Toll Road in Natuna				
Sea-Toll Road in Biak				

Table 8 Economic Aspect
Source: Own elaboration

For the economic aspect, we used four indicators consists of price disparity, inflation, economic growth and, poverty. The price disparity and economic growth are selected as the main target of the Presidential Decree Number 70 in 2017. Inflation is selected as the inflation rate in Indonesia is influenced by the price of basic and essential commodities such as rice, shallot, onion, and red chilli (Darma, et al., 2018). Also, the commodity price the one factor that related to poverty rate in Indonesia. Moreover, if the disparity price and poverty rates reduced, it will indicate the excellent result of the implementation of this policy. And for economic growth, the increases of economic growth in one region will mean the Sea-Toll Road program achieves the government ambition to boost economy condition in peripheral. On the other hand, the inflation rate will represent as the stabilise economic situation as the disparity between island decrease but, if the level of inflation is too low or below the Ministry of Finance's inflation target, it will indicate the weak economic condition as the purchasing power of people is weak.

3. Maritime service and function aspect

	Total Throughput	Port Integration	Logistics Integration	Transportation cost
Sea-Toll Road in Natuna				
Sea-Toll Road in Biak				

Table 9 Maritime service and function
Source: Own elaboration

For the service and function level, there are four variables like total throughput, port integration, logistic integration, and transportation cost. Total throughput is chosen as the parameter of inter-island trade and representation of the success of this policy (Directorate General of Domestic Trade, 2018). The integration between the port and logistics are imperative to be selected as one of indicator based on the Adam & Dwiastuti (2015) explanation as connectivity of inter-island should support with deep integration level. For the last, transportation cost is chosen as it is the main target of the government to establish an affordable transportation cost. For the result, the increasing of total throughput will represent the success of the program as this program wants to increase inter-island trade, while the decreasing of throughput means the Sea-Toll Road has not performing well their target. For port and logistic integration, if the integration is limited it will make the reducing of disparity price not significant. For the transportation cost, the decreasing of transportation will result a good achievement for government as the Sea-Toll Road program aims to reduce the disparity through the declining of transportation cost.

3.2 Data

To analysis the model and obtain the result, some data are needed. This research will use an academic journal and secondary data from related institution such as government agencies and state-owned company. Moreover, the table below shows the list of data source.

Data	Source
The Historical Policy of the Sea-Toll Road	Presidential Decree Number 70 in 2017, Ministry of Justice and Human Rights
The Implementation of Sea-Toll Road	Ministry of Transportation and Ministry of Trade
The Barrier of Sea-Toll Road program	Academic Journal, Ministry of Transportation, Ministry of Trade, and state-owned company
The impact of Sea-Toll Road program	Academic Journal, Local government report, Ministry of Transportation, Ministry of Trade, Indonesian Bureau Statistic and state-owned company

Table 10 Data source

Chapter 4 General Condition of the Sea-Toll Road Implementation

4.1 Stakeholders in the Sea-Toll Road Program

In implementing the Public Service Obligation (PSO) scheme, the government appointed both government agency and stated-owned company to in charge in the Sea-Toll Road scenario. The government agencies that selected are Directorate General for Sea Transportation, Ministry of Transport and Directorate General for Domestic Trade while the state-owned company such as PT. Pelayaran Nasional Indonesia (Pelni), PT. Angkutan Sungai dan Penyeberangan (ASDP) are responsible for shipping and PT. Pelabuhan Indonesia (Pelindo) for port operation. Therefore, for the rest of route the government will open a tender for private company.

4.1.1 Directorate General of Sea Transportation

According to Presidential Decree Number Year of 2017, the government body that responsible handle this implementation is the Ministry of Transport. For the technical aspect, it will implement by Directorate-General for Sea Transportation, which leads by a bureaucrat with echelon one rank. The Directorate-General for Sea Transportation is responsible for allocating the budget to run this program by giving the money for the stated-owned that chosen as operator and doing open tender system for the routes that served by a private company.

4.1.2 Directorate General of Domestic Trade

The essential function of the Directorate General of Domestic Trader are formulate of policies in the field of distribution control and availability of essential goods and/or essential goods, fostering actors and distribution businesses, creating and fostering business climate, trading transactions through electronic systems, developing trade distribution facilities, and trade between islands and borders (Directorate General of Domestic Trade, 2019). The directorate is under Ministry of Trade which lead by Director General. Following the role of Presidential Decree Number Year of 2017, the Directorate General for Domestic Trade takes a role to control and monitor the distribution of the essential and basic commodities in remote, rural, outermost and borderland regions. They control it by settled down the logistic warehouse known as Rumah Kita and also, they coordinate and consolidating for return freight from rural area to city.

4.1.3 Local Government

In regions level, the local Board such as Board of Trade and Board of Transportation is involved in logistic consolidation to fulfil back return cargo to hub-area. However, based on Iskandar & Pasaribu (2017), the local government roles in the Sea-Toll Road project is limited. The Directorate-General for Domestic Trade only involves the local board in the section of goods collection that can be brought to the mainland. In fact, the regional must and could play a huge role in this program. They can act as the logistic consolidator booth for arrival and chargeback goods. It is indeed that they know better about the goods that they need and potency products that can be shipped by the Sea-Toll Road ships to hub areas.

4.1.4 Stated-owned Company

As the function of state-owned companies that had responsible to act as Public Service Obligation (PSO), several companies such as ASDP, Djakarta Llyod, and PT. Pelni were instructed to ship the container remote, rural, outermost and borderland regions. So far, in 2019 Pelni had servicing 5 routes, Djakarta Lloyd 4 routes, and following by ASDP with 2 routes.

4.1.5 Private Operator

In the Sea-Toll Road program there are some private companies that serve Sea-Toll routes because the limitation of vessel ability and capacity from state-owned company. In order to achieving the target, Directorate General of Sea Transportation opens the participation of the private company to join the Sea-Toll Road scheme by open tender mechanism. Recently, there 6 routes that running by private companies like Meratus Line, Mentari Line and Temas Line.

4.3 Advantages of the Sea-Toll Road Program

As we know, the condition of economic in remote, rural, outermost and borderland regions are nonoptimal. According to Mankiw & Taylor (2014), sometimes the government should intervention and influence the market condition to far better condition. Linking it into the Sea-Toll Road project, Indonesian government wants to get advantage in peripheral area by improving market condition through subsidize program. As Coordinating Ministry for Maritime Affairs (2019) stated that the main function of the Sea-Toll Road Program are to reduce the disparity price, guarantee the availability of staple goods in rural area, and bridge the connection of inter-island.

Furthermore, this policy has brought many advantages in multi-dimension such as government side, economic side, and maritime function side. From government side, the Sea-Toll Road project is a conclusive evidence for society that government wants to realize the value of Pancasila (Indonesian ideology) based on concept (Directorate of Transportation, 2015) . Moreover, for the economic side, the Sea-Toll Road attempted to reduce the disparity price which could link to economic growth. And for service level it could established regular shipping schedule, connecting inter-island, and increasing port integration level (Directorate General for Sea Transportation, 2018).

	Economic side	Service and function side
Advantages of The Sea-Toll Road program	<ol style="list-style-type: none"> 1. Reducing disparity price 2. Increase the economic growth 	<ol style="list-style-type: none"> 1. Inter-island connectivity 2. Port Integration 3. Logistic Integration 4. Reduce transportation cost

Table 11 Advantages of the Sea-Toll Road Program
Source: Own elaboration

4.4 Barrier of the Sea-Toll Road Program

There are several barriers that inhibiting the progress of the Sea-Toll Road. We classify it into three sides, technical, policy, and political side.

Based on evaluation of the Sea-Toll Road Program, there are common difficulties in the field (Trade, 2019). The barriers are:

1. Ineffectiveness of the Sea-Toll Road's network
2. Mismatch in the commodities that are transported
3. Uncertainty of Vessel schedule and voyage time
4. Lack of promotion and socialisation of the Sea-Toll Road benefit to regional government and local entrepreneur
5. Some vessels out of order

According to Zamal (2018), the long round-trip-voyage time, the increases target that port should visit and the expanding of the subsidized regions makes this project has slow progress. To tackle this condition the government should evaluate the network by creating optimal network that well efficient.

For the policy side, Wicaksana (2017) explained, Sea-Toll Road program is an ambitious project which based on centralisation. The implementing system of maritime transportation handles by the ministry of transportation as a central government representative. The lack of coordination, consultation, and evaluation with local government tighten the advisability of this program. As the evidence, the limitation of freight return from the rural area to the origin point occurs due to lack of participation of regional government into logistic consolidation (Iskandar & Pasaribu, 2019).

However, the political condition in recently also appear as a potential obstacle of this mega project. According to Wicaksana (2017) in recent years the strong opposition was keen to hinder government maritime infrastructure project which need support by legislative level. For instance, the stuck up on the revision of the transportation policy. With their argument such as the project only waste national budget and better to allocate the money for education or health program. It is undeniably true that political environment vigorously can be treated for the continuity of the Sea-Toll Road project.

4.5 Implementation of the Sea-Toll Road from 2016- 2019

4.5.1 Implementation in 2016

The first year of implementing the Sea-Toll Road Program in 2016 was based on Presidential Decree Number 70 in 2017. This year the Ministry of Transportation allocated funds of Rp. 218.990.000.000 around \$15,348,674.86 for the operation of 6 routes and all services were carried out by Pelni (Directorate General of Sea Transportation, 2018). The route consists of:

1. Route 1 (T-1) = Tj. Perak- Wanci- Namlea- Fak-Fak- Kaimana- Timika- Kaimana- Fak-Fak- Namlea- Wanci- Tj, Perak.

2. Route 2 (T-2) = Tj. Perak- Kalabani- Moa- Saumlaki- Dobo- Merauke- Dobo- Saumlaki- Moa, Kalabahi, Tj. Perak
3. Route 3 (T-3) = Tj. Priok- Makassar- Manokwari- Wasior- Manokwari- Makassar- Tj. Priok
4. Route 4 (T-4) = Tj. Priok- Makassar- Manokwari- Wasior – Nabire- Wasior- Manokwari- Makassar- Tj. Priok
5. Route 5 (T-5) = Makassar- Tahuna- Lirung- Morotai- Tobelo- Ternate- Babang- Ternate- Tobelo- Morotai- Lirung-Tahuna- Makassar
6. Route 6 (T-6) = Tj. Priok- Tarempa- Natuna- Tarempa- Tj. Priok

The Sea-Toll Networks in 2016



Figure 38 The Sea-Toll Road Networks in 2016
Source: (Directorate General of Sea Transportation, 2018)

In the enforcement of 2016, The Sea-Toll had success to show its benefit by reducing some commodities prices in several regions both east and west Indonesia (Ministry of Trade, 2018). The prices decline varied, for instance, in the Western part, the commodities price like rice and sugar have fallen by 14% to 16% while in the eastern region the reducing price has dropped between 13% to 17% (Detik Finance, 2017).

No.	Commodity	Price Declines In Larantuka (East)	Price Declines In Fak-fak (East)	Price Declines In Anambas (West)	Price Declines In Natuna (West)
1	Rice	17%	13%	16%	16%
2	Sugar	17%	16%	14%	14%
3	Vegetable oil	12%	-	-	-
4	Playwood	4%	-	-	-

Table 12 The Declining Price of Commodities in East and West Indonesian

Source: (Detik Finance, 2017)

However, according to the Minister of Transportation, implementation in the first year were many shortcomings (Directorate General for Sea Transportation, 2017). Some technical aspects that took place such as damaged ships, irregular ship departure schedules, and lack of port infrastructure in non-commercial port areas such as cranes, forklifts and stacker became a serious barrier.

Furthermore, based on the evaluation of the Ministry of Trade (Ministry of Trade, 2017) the sea toll program, it is noted that there are still several types of commodities that are found out of applicable regulations. Moreover, as shown on figure 6 it can be seen the realisation freight goes and freight returns are imbalance where the cargo back to the hub-areas only 1.770 tons. To tackle this phenomenon, it needs a significant role by from local government, central government, and ship operator for logistics consolidation.

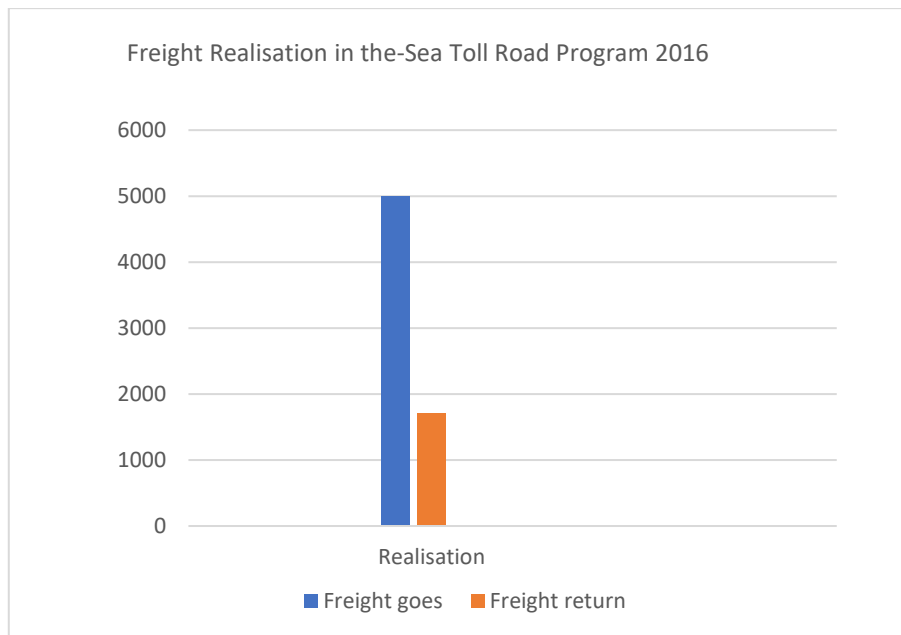


Figure 39 Freight Realisation in the Sea-Toll Road Program 2016
Source: (Directorate General of Sea Transportation, 2018)

4.5.2 Implementation in 2017

In implementing the 2017 program, the Ministry of Transportation allocated a budget of Rp. 335.051.237.000 around \$ 23,483,387.17 with a subsidy pattern to cover ship operating costs. The route has been expanded to 13 with Pelni as the ship operator for 7 routes and 6 routes carried out by private companies. The route consists of:

1. Route 1 (T-1) = Tj. Perak- Wanci- Namlea- Wanci -Tj, Perak.
2. Route 2 (T-2) = Tj. Perak- Kalabani- Moa- Saumlaki- Moa- Kalabahi- Tj. Perak

3. Route 3 (T-3) = Tj. Perak - Calabai- Maumere- Wasior- Larantuka- Lewoleba- Rote- Sabu-Wiangapu- Sabu- Rote- Lewoleba- Larantuka- Maumere- Calabai- Tj. Perak
4. Route 4 (T-4) = Tj. Priok- Makassar- Tahuna- Lirung-Morotai- Lirung- Tahuna- Makassar- Tj. Perak
5. Route 5 (T-5) = Tj. Perak- Makassar- Tahuna- Lirung- Morotai- Lirung- Tahuna- Makassar- Tj. Perak
6. Route 6 (T-6) = Tj. Priok- Pangkal Balam- Tarempa- Natuna- Tj. Priok
7. Route 7 (T-7) = Tj. Priok- Tj. Pandan- Pangkal Balam- Tarempa- Natuna- Tj. Priok
8. Route 8 (T-8) = Teluk Bayur- Nias- Mentawai- Teluk Bayur
9. Route 9 (T-9) = Tj. Perak- Belang Belang- Sangatta- Sebatik- Tj. Perak
10. Route 10 (T-10) = Tj. Perak- Tidore- Tobelo- Morotai- Maba- Pulu Gebe- Tj. Perak
11. Route 11 (T-11) = Tj. Perak- Saumlaki- Dobo- Saumlaki- Tj. Perak
12. Route 12 (T-12) = Tj. Perak- Manokwari- Wasior- Nabire- Serui- Biak- Serui- Nabire- Wasior- Manokwari- Tj. Perak
13. Route 13 (T-13) = Tj. Perak-Fak-fak- Kaimana- Timika- Kaimana- Fak-fak- Tj. Perak

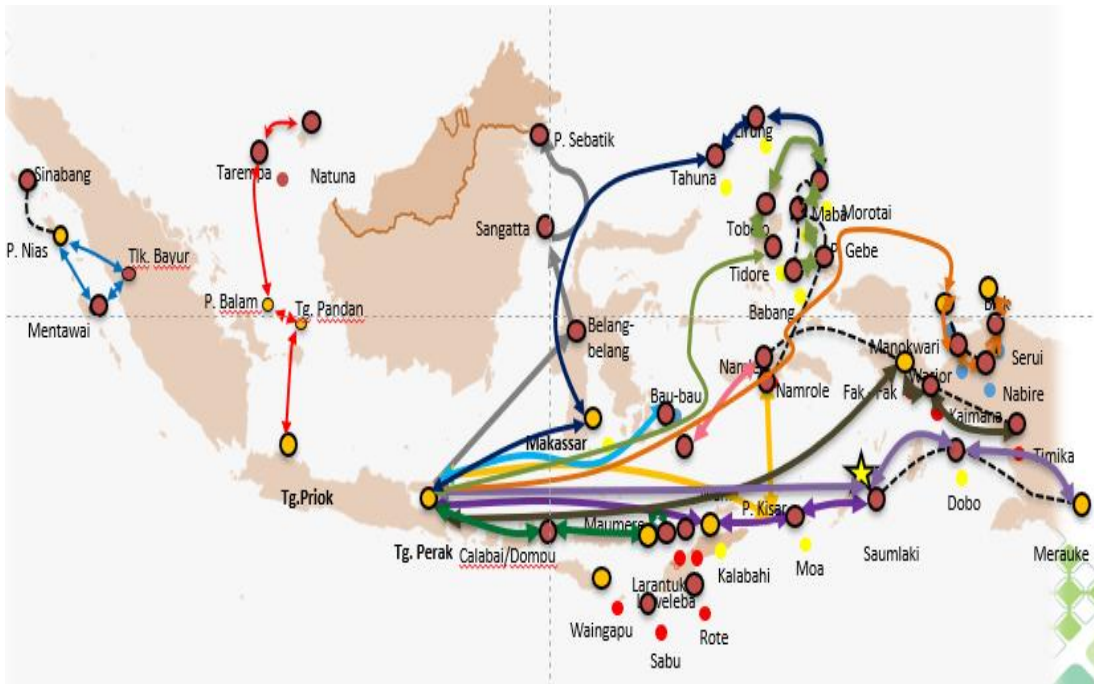


Figure 40 the Sea-Toll Road Network in 2017
 Source: (Directorate General of Sea Transportation, 2018)

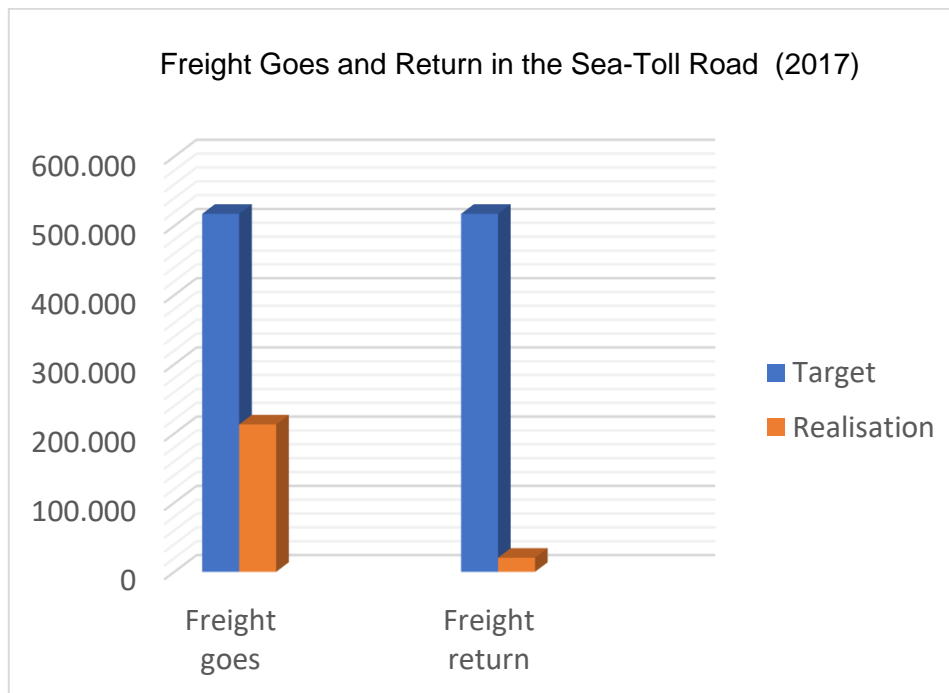


Figure 41 Freight Goes and Return in the Sea-Toll Road Program in 2017
 Source: (Directorate General of Sea Transportation, 2018)

Based on figure 8, the insignificant of cargo returning from remote, rural, outermost and borderland regions to hub-areas is due to insufficient planning to list potential

product in those areas. Therefore, this also complicated by the lack of industries in remote areas so that commodities brought back to the hub are generally raw goods. According to Ministry Transportation (2017), it is necessary to improve the Presidential Decree number 105 in 2015 by sending the goods that could trigger the developing industries in that area. The revision yet should include the subsidy for returning freight to the hub area.

4.5.3 Implementation in 2018

The implementation of the Sea-Toll Road in 2018 was based on the new policy the Presidential Decree Number 70 in 2017. There are some differences in recent rule whereas the subsidy type evolves as 2 types, subsidy for vessel operation and container voyage. The Directorate General for Sea Transportation spent budget about Rp. 447.628.808.000 around \$ 31,373,386.73 and this program operated with 18 routes. Therefore, Pelni was operated 6 routes, ASDP 2 routes, and Djakarta Lloyd 3 routes while 7 routes were operated by private company. The route consists of:

1. Route 1 (T-1) = Belawan- Malahayati- Sabang- Tapak Tuan- Belawan
2. Route 2 (T-2) = Teluk Bayur- Sinabang- Mentawai- Teluk Bayur
3. Route 3 (T-3) = Tj. Priok- Tarempa- Selat Lampa- Penagi- Serasan- Midai- Tj. Priok
4. Route 4 (T-4) = Makassar- Polewali- Belang- belang- Sangat- Nunukan- Sebatik- Makassar
5. Route 5 (T-5) = Bitung- Tagulandang- Tahuna- Melangoane- Miangas- Marore- Bitung
6. Route 6 (T-6) = Bitung- Pagimana- Bunta- Mantangisi
7. Route 7 (T-7) = Tj. Priok- Tj. Pandan- Pangkal Balam- Tarempa- Natuna- Tj. Priok
8. Route 8 (T-8) = Tanjung Perak- Biak- Tanjung Perak
9. Route 9 (T-9) = Tj. Perak- Belang Belang- Sangatta- Sebatik- Tj. Perak
10. Route 10 (T-10) = Tj. Perak- Tidore- Tobelo- Morotai- Maba- Pulu Gebe- Tj. Perak
11. Route 11 (T-11) = Tj. Perak- Saumlaki- Dobo- Saumlaki- Tj. Perak
12. Route 12 (T-12) = Tj. Perak- Manokwari- Wasior- Nabire- Serui- Biak- Serui- Nabire- Wasior- Manokwari- Tj. Perak
13. Route 13 (T-13) = Tj. Perak-Fak-fak- Kaimana- Timika- Kaimana- Fak-fak- Tj. Perak.
14. Route 14 (T-14) = Tenau- Lewoleha- Tabilota- Larantuka- Marapoko- Tenau

- 15. Route 15 (H-1) = Tj. Perak- Makassar- Bitung- Tidore- Tj. Perak
- 16. Route 16 (H-2) = Tj. Perak- Wanci- Namlea- Namrole- Tj. Perak
- 17. Route 17 (H-3) = Tj. Perak- Tenau- Saumlaki- Dobo- Tj. Perak
- 18. Route 18 (H-4) = Tj. Perak- Makassar- Kendari- Tj. Perak

The Sea-Toll Networks in 2018

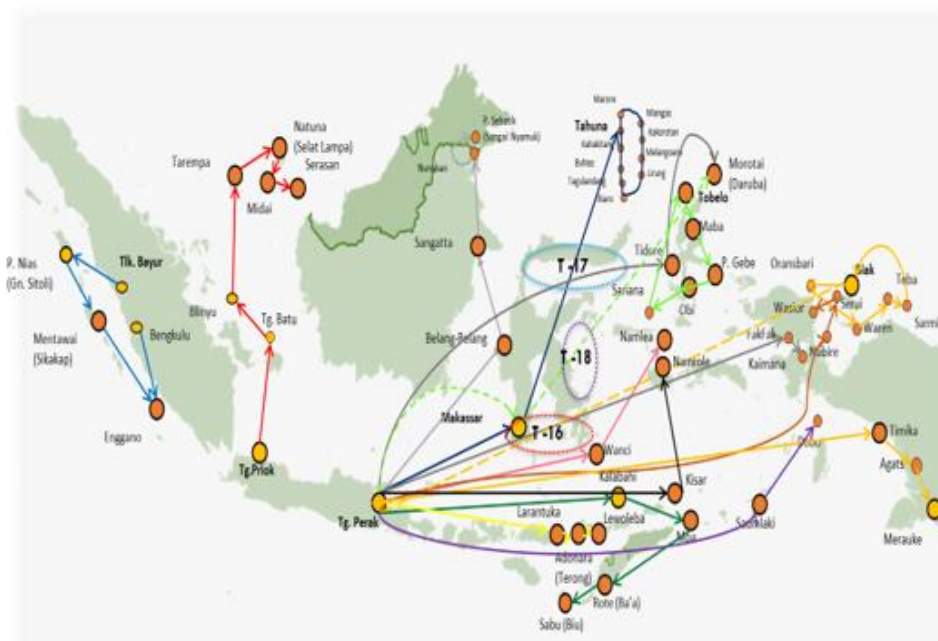


Figure 42 the Sea-Toll Road Network in 2018
 Source: (Directorate General of Sea Transportation, 2018)

As we can see on table 6, the implementing of program in 2018 has bring more benefits than latter program for decreasing the logistic cost. For instance, the price of commodities has been fallen around 14% in west region while in east part it reduced about 9.6%.

No	Commodity	Price Decline In Natuna	Price decline in Anambas	Price decline in Yapen	Price decline in Biak
1	Rice	20%	-	-	8%
2	Sugar	17%	7%	12%	13%
3	Vegrtable oil	6%	-	6%	-
4	Wheat flour	28%	-	-	-
5	Chiken	-	7,89%	-	15%
6	Cement	-	--	-	4%

Table 13 The Declining Commodities price in the Sea-Toll Program the year 2018
 Source: (Directorate General of Domestic Trade, 2018)

4.5.3 Implementation in 2019

The implementation of 2019 program, through Directorate General for Sea Transportation (2019), the government allocated budget about Rp. 222.028.807.000 or \$ 15,1561,722.17. In this program, government had reducing the budget almost 50% than previous year. Moreover, the pattern of subsidy and route are similar with the last program in 2018.

The Sea-Toll Networks in 2018

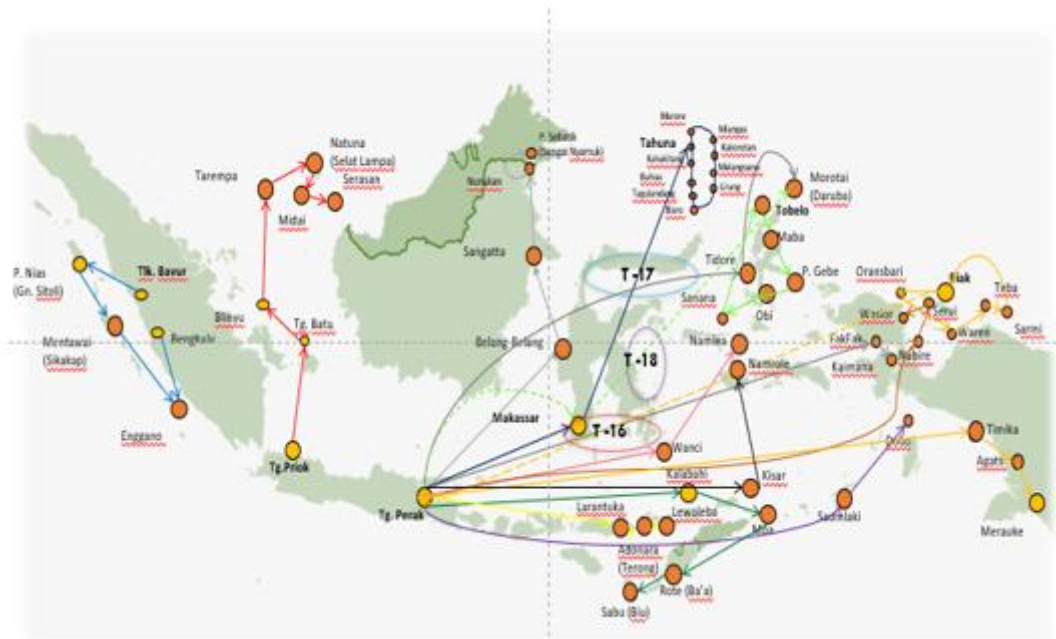


Figure 43 the Sea-Toll Road Network in 2019
Source: (Directorate General of Sea Transportation, 2018)

The route consists of:

1. Route 1 (T-1) = Belawan- Malahayati- Sabang- Tapak Tuan- Belawan
2. Route 2 (T-2) = Teluk Bayur- Sinabang- Mentawai- Teluk Bayur
3. Route 3 (T-3) = Tj. Priok- Tarempa- Selat Lampa- Penagi- Serasan- Midai- Tj. Priok
4. Route 4 (T-4) = Makassar- Polewali- Belang- belang- Sangat- Nunukan- Sebatik- Makassar
5. Route 5 (T-5) = Bitung- Tagulandang- Tahuna- Melangoane- Miangas- Marore- Bitung
6. Route 6 (T-6) = Bitung- Pagimana- Bunta- Mantangisi

7. Route 7 (T-7) = Tj. Priok- Tj. Pandan- Pangkal Balam- Tarempa- Natuna- Tj. Priok
8. Route 8 (T-8) = Tanjung Perak- Biak- Tanjung Perak
9. Route 9 (T-9) = Tj. Perak- Belang Belang- Sangatta- Sebatik- Tj. Perak
10. Route 10 (T-10) = Tj. Perak- Tidore- Tobelo- Morotai- Maba- Pulu Gebe- Tj. Perak
11. Route 11 (T-11) = Tj. Perak- Saumlaki- Dobo- Saumlaki- Tj. Perak
12. Route 12 (T-12) = Tj. Perak- Manokwari- Wasior- Nabire- Serui- Biak- Serui- Nabire- Wasior- Manokwari- Tj. Perak
13. Route 13 (T-13) = Tj. Perak-Fak-fak- Kaimana- Timika- Kaimana- Fak-fak- Tj. Perak.
14. Route 14 (T-14) = Tenau- Lewoleha- Tabilota- Larantuka- Marapoko- Tenau
15. Route 15 (H-1) = Tj. Perak- Makassar- Bitung- Tidore- Tj. Perak
16. Route 16 (H-2) = Tj. Perak- Wanci- Namlea- Namrole- Tj. Perak
17. Route 17 (H-3) = Tj. Perak- Tenau- Saumlaki- Dobo- Tj. Perak
18. Route 18 (H-4) = Tj. Perak- Makassar- Kendari- Tj. Perak

Chapter 5 Result and Analysis

5.1 Case 1 The Sea-Toll Road Project in Natuna Island

Natuna is one of the outermost areas in western Indonesia which under the administration of Riau Island province. This regency has a land and sea area of $264,198.37 \text{ km}^2$ with a land area of $2,001,30 \text{ km}^2$ and an ocean of $262,197.07 \text{ km}^2$. By administration, the Natuna Regency government consists of 12 Districts (Midai District, Bunguran Barat, Bunguran Utara, Pulau Laut, Pulau Tiga, East Bunguran Timur, Bunguran Timur Laut, Bunguran Tengah, Bunguran Selatan, Serasan, Subi and Serasan Timur) (Indonesian Bureau Statistic, 2018). Natuna are directly bordered with:

1. East Side : Bordered with Eastern Malaysia (Sarawak).
2. Northern side : Bordered with Vietnam and Cambodia.
3. Southern Side : Bordered with Bintan Island.
4. West side : Bordered with Peninsular Malaysia and Anambas Islands.



Figure 44 Natuna Island Location
Source: Google Maps

According to Indonesian Bureau Statistic (2018), Naturally Natuna is a regency with abundant natural resources such as the fisheries, crude oil, and natural gas sectors.

However, due to various lacks like human resource and infrastructure Natuna remains the outermost region in Indonesia with a high poverty rate of around 4.64% in 2017. Apart from that, Natuna's economic growth has also dropped extremely in recent years about -0.10%.

Furthermore, serviced by the Sea-Toll Road program since 2016. Currently, Natuna's Sea-Toll route covered by T-3 Route (Tj. Priok- Tarempa- Selat Lampa- Penagi-Serasan- Midai- Tj. Priok). Based on government stipulation Tanjung Priok is the hub-area of this route with PT. Pelni (State-owned company) plays a role as the ship operator. The activity loading and unloading of the Sea-Toll Road program held through Selat Lampa port. Which status of this terminal is non-commercial port and managed by technical implementation unit of the Ministry of Fishery.

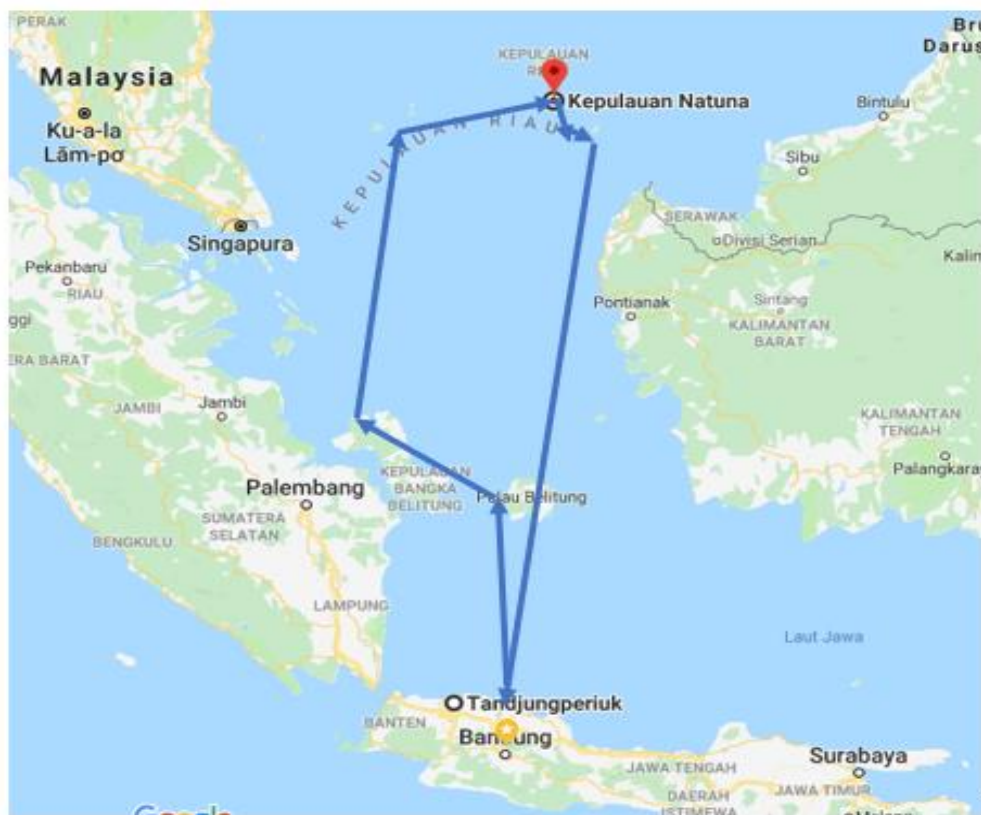


Figure 45 T-3 Route
Source: Google Maps

During these years, it is clear that it is clear that the Sea-Toll Road has decreased the disparity price in Natuna, Riau Island, especially for basic and essential commodities. The price of basic commodities such as rice, chilli, sugar, and vegetable oil, white flour, beef, frozen chicken, for instance, has decreases around 13.25% while the essential commodities such as plywood and light steel have declines around 25,5%.

Based on data from related government agency, we will analyse the case bellow according to our framework.

1. Aspect of Government and Institutional

Based on our data, there are around 10 different policies that have released for issues related to the Sea-Toll Road program. These policies were put out by the level of central government such as presidential, ministerial, and directorial general level. In term to decide and provide the subsidise scheme related to the stakeholders. The average policy update around 3 regulations per year and most of those regulation comes from central government. On the other hand, the regulations of the Natuna regional government in supporting the implementation of the Sea-Toll Road program are almost non-existent unless they are limited to support without issuing specific regulations for the sea toll program.

Thus far, the coverage Sea-Toll Road regulations that have been issued are very limited. This is shown through the contents of the policy that only covers the operational side of the program such as technical operations of ships, sea toll route tariffs, and loaded freight so that the effectiveness of this program is still lacking. update

For the effectiveness its self, we observe that the Sea-Toll Road program is less effective as this project is too centralistic. The less participation from local government efforts are shown by there is no provincial or regional policy issued to support the implementation of the Sea-Toll Road project. However, the loaded freight back to hub-area is highly dependent on coordination and consolidation between Natuna government, ship operators, and the Ministry of Trade in term to fulfil the freight quota. Moreover, it occurs as the prerogative of the central government that is powerfully set up for the maritime affairs and air affairs while the local government authority only stipulates the land affairs.

Furthermore, in the supervision side, even though 10 policies have been issued that are related to the Sea-Toll Road program in Natuna Island. By contrast, the supervision is only monitored by the representative of central government such as Indonesia's Corruption Eradication Commission (KPK), Audit Board of Indonesia (BPK), Inspectorate General of Ministry of Transportation, and Inspectorate General of Ministry of Trade. Therefore, this phenomenon makes the regency government tough to monitor this project.

2. Aspect of Economic

Based on data from Directorate General for Domestic Trade, there have been decreases for essential and basic commodities with around 14%. Therefore, we found there is the gap price among hub-area in Tanjung Priok, Jakarta and Natuna Island regency around 20%. However, the 20% of gap price appears as the freight handling in road leg is highly expensive (PT. Pelni, 2019) so that the decreasing of logistics cost between hub-area and Natuna Island is not really significant.

Commodity	Price reduction	Price gap with Hub area (Tj. Priok, Jakarta)
Rice	20%	11,25%
White Flour	28%	35,5%
Sugar	17%	9,09%
Vegetable oil	6,4%	26,8%
Chicken	12,5%	30,4%
LPG/ 12 kg	6,67%	20,5%
Cement	7,89%	9%

Table 14 Price reduction in Natuna and gap price with hub-area.
Source: (Directorate of Sea Traffic and Transport, 2019)

In the economy side, the economic growth in Natuna Island has experienced decreases in recent years. Even in 2017, the economic growth swings down to -0,10%. According to Indonesia's Central Bank, this situation occurs as a result of the declining of people purchasing power in Indonesia. In general, the overall purchasing power of society in Riau Island tend to fall. We could see it as the inflation in Natuna Regency in the last four years are extremely low, around 20%. It far below than target of the Ministry of Finance, which average level of Inflation in 2019 should be 3,5% with 1% of deviation.

Inflation in Natuna	2016	2017	2018	2019* (until July)
	0,32%	0,13%	0,27%	0,2%
Economic growth	2015	2016	2017	
	3,03%	2,9%	-0,10%	

Table 15 Inflation and economic growth in Natuna Island
Source: (Indonesian Bureau Statistic, 2018)

It means the government's expectation to boost the economic condition in remote, rural, outermost and borderland regions are not yet optimal. The Sea-Toll Road program should be supported and connected with the industrial area in order to improve economic growth. According to Buana (2017), in order to develop peripheral area successfully, it needs the developing based on Maritime industry such as shipyard or fisheries.

Furthermore, linking it into the poverty condition, it also shows that the declining of disparity price in Natuna Island not simultaneously could decrease the poverty level in Natuna Island regency. It shows by data of Indonesian Bureau Statistic (2019) which in the last three years back, the poverty level still fluctuating and tend to decrease from 2015 to 2017.

Poverty rate in Natuna		
2015	2016	2017
4,34%	4,33	4,64

Table 16 The poverty rate in Natuna
Source: (Indonesian Bureau Statistic, 2018)

3. Aspect of maritime trade and service aspect

As we would focus on the service aspect of the Sea-Toll Road program, we collected the throughput data and types of goods that transported to Regency of Natuna Island in term of the realisation Sea-Toll Road program in T-3 route. Besides, the vessel voyage is from Tanjung Priok, Jakarta to Selat Lampa port, Natuna Island. The data over these three years can be shown as below:

Route	Year			
	2016	2017	2018	2019* (until may)
Tj- Priok -Natuna	293,33 Ton	2.789 Ton	690 Ton	420 Ton
Natuna- Tj. Priok	67.664 Ton	134.862 Ton	67.1 Ton	122 Ton

Table 17 Total throughput from Tanjung Priok to Natuna and Natuna to Tj. Priok
Source: Own elaboration from the government of Natuna Island (2019).

The majority of goods shipment from Tj. Priok to Natuna

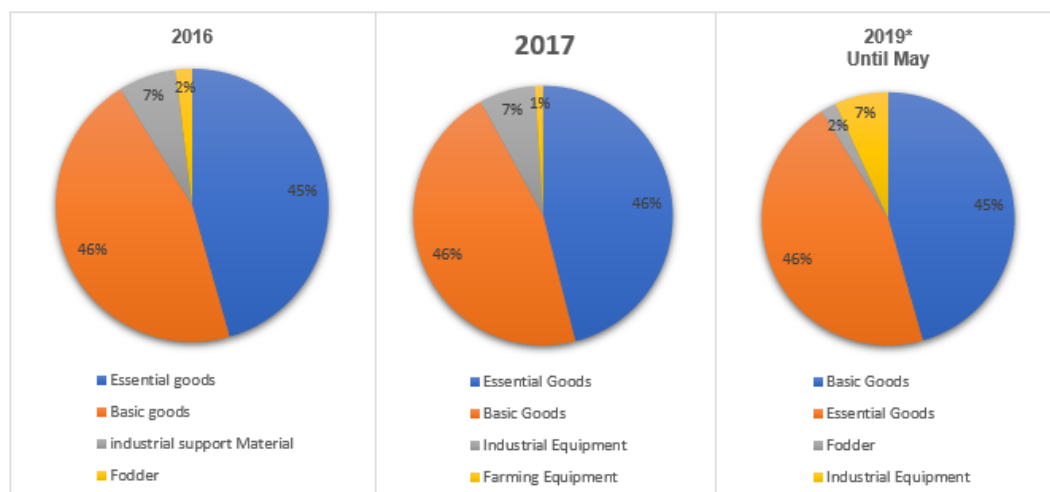


Figure 46 The majority of goods shipment from Tanjung Priok to Natuna
Source: (Natuna government, 2019)

Based on the table above, it can be seen that the shipment of the goods from Tanjung Priok, Jakarta to Natuna Island is up and down where the average of total throughput tends to decline and vice versa. Nonetheless, in 2017 the shipment is highly increasing

both Tanjung Priok- Natuna Island and Natuna Island- Tanjung Priok. It occurs as the subsidy in 2017's budget had risen 34% than in 2016. Moreover, the majority of the commodity that delivers to Natuna Island regency dominated by the basic and essential commodity such as rice, sugar, white flour, red onion, chicken, plywood, cement, etc. While the freight back to hub-area in Tanjung Priok mostly fulfils by marine product. According to Ministry of Trade (2019), there are several reasons for the declining trend of total throughputs such as the reduced of subsidy budget around 40%, lack of number reefer container to the loaded marine product, lack of logistic consolidation between ship operator and local entrepreneur, and uncertainty of voyage time.

Furthermore, we also found that based on Natuna Regency report, the limitation of the goods that carry by the Sea-Toll Road' ship due to the regulation makes this program ineffective. Other imperative goods that not listed in the policy makes the price of products such as medicine, electronics, and industrial tool are high. Besides, industrial tools are essential to support the industry. For instance, the fisherman in Natuna island rely on fisheries equipment such as fishing net, engine, and spare part to boost their productivity. That so it impacts as one barrier to improving the economic and industry condition. To tackle this situation, we found that the government of Natuna Island tries to lodge the proposal to revoke the limitation of the commodity that brings to Natuna Island and vice versa. The lists are:

Proposal for the loading of goods	
Freight from Tj. Priok to Natuna	Freight from to Natuna Tj. Priok
Furniture	Agricultural product
Electronic	Marine products
Vehicle	Secondhand
Medicines	Handicraft
Sport equipments	
Education equipments	
Health equipments	
Agricultural tools	
Fisheries tools	
Industrial tools	
Carpentry tools	
Machine spareparts	
Building material	

Table 18 Proposal for the loading of goods from Natuna government
Source: (Natuna government, 2019)

From the shipping line view, the revoke of limitation goods will make the route more attractive (Zamal, 2018). Based on the scenario of Zamal (2018), the addition of listed goods that carried will bring a positive impact to reduce the shipping cost around 6% of the unit cost from the proposed. Based on that view, the alteration of policy should be considered in term to establish the firm route. Moreover, it also makes a new opportunity for a local entrepreneur to expand their product to a bigger market.

For port integration level, it can be seen on the figure below, the Port of Selat Lampa has connected to marine processing industry known as Integrated Centre for Marine and Fisheries (SKPT). The marine and fisheries products could distribute directly from

Selat Lampa port to hub-area. Therefore, the expanding plan of port integration between Natuna Island to Batam Island as the special economic zone as The Ministry of National Development Planning's (2019) also enhance the port integration level.

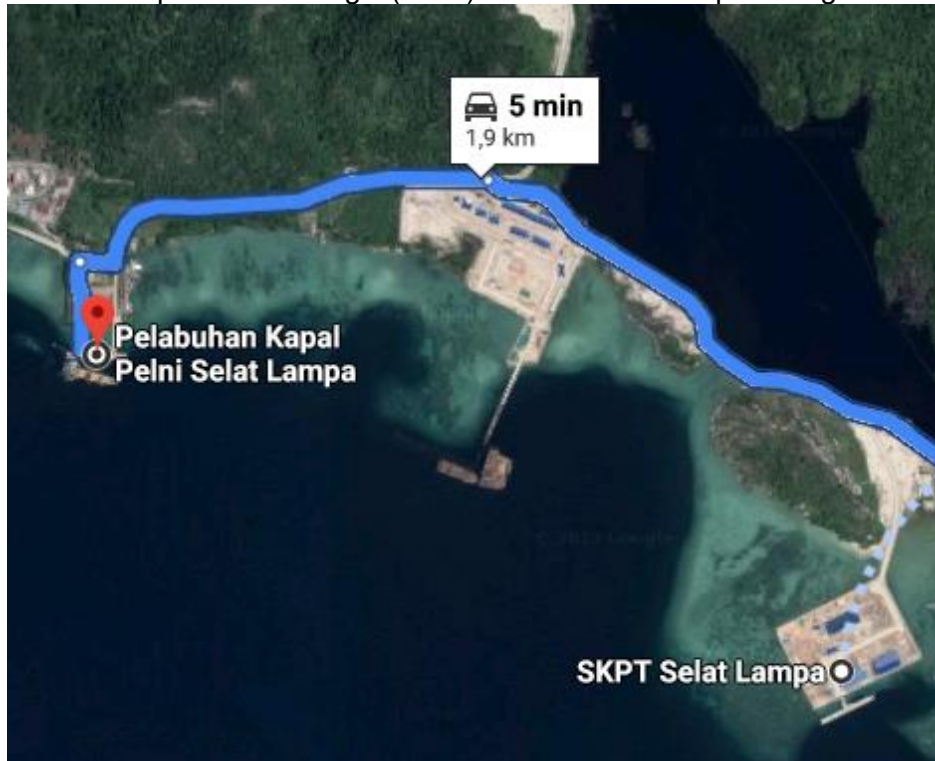


Figure 47 The distance between Selat Lampa Port and SKPT centre
Source: Google maps

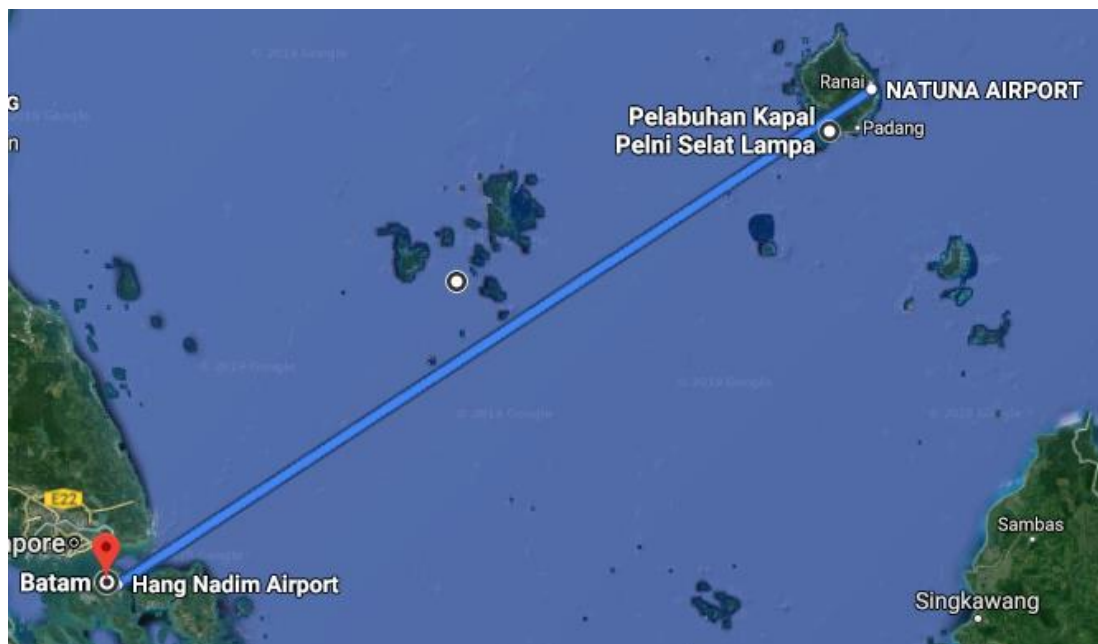


Figure 48 Integration between Natuna and Batam Special Economic Zone
Source; Google maps

Furthermore, existing logistics integration is not yet optimal. The high distance between Selat Lampa port and city centre, Ranai which should travel around one and a half hour for 68,2 km makes a road leg cost high, according to PT. Pelni around 70% of shipping cost is used for the goods distribution in landside. Moreover, this condition is severed by the truck and stevedoring cost, which very expensive. However, there is an alternative port such as Penagi port which more closely with the city centre. Due to the limitation of infrastructure and insufficient port draft. It is improbable for the vessel to moor as the specification of the vessel in T-3 route is served by Logistik Nustara ship with the weight of 3000 GT (Groos Tonnage).

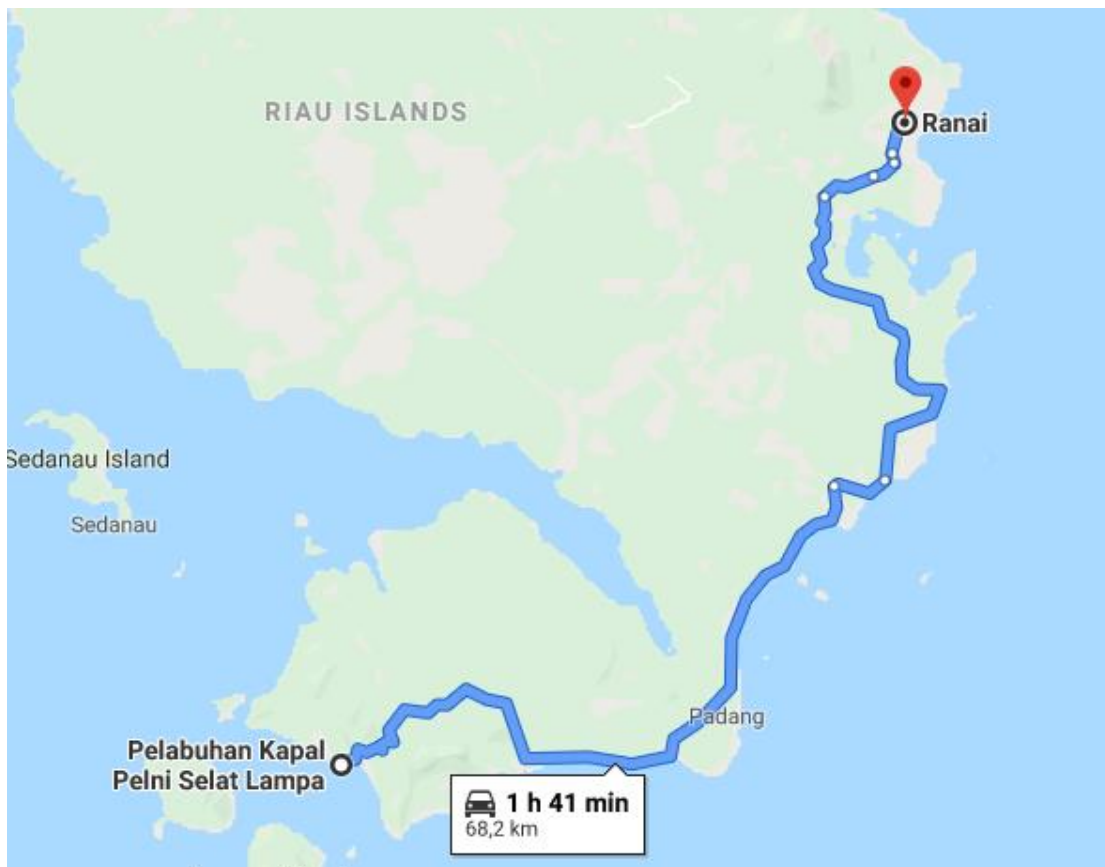


Figure 49 Distance between Selat Lampa port to city centre
Source: Google maps



Figure 50 The location of Selat Lampa Port (Left) and Penagi Port (right)
Source: Google maps

For transportation cost, there is a significant tariff reduction, especially sea transportation, due to the subsidy. Comparing with non-Sea Toll Road, the tariff more expensive around 90% than Sea-Toll Road's tariff. Moreover, the trend of Sea-Toll Road tariff from Tanjung Priok to Natuna Island have also declined from 2016 to 2017 due to increased subsidies from year to year except in 2019. However, in 2019 the tariff is slightly increasing same as in 2016 due to the reduction of subsidy budget. Therefore, for the tariff from Natuna Island to Tanjung Priok remains the same as the government commitment to keep support local entrepreneur (Directorate of Sea Traffic and Transport, 2019).

Year	Sea Toll Road Tarrif				Non-Sea Toll Road Tarrif
	Tj. Priok-Natuna (Dry container)	Tj. Priok-Natuna (Reefer)	Natuna- Tj. Priok (Dry container)	Natuna- Tj. Priok (Reefer)	Tj. Priok-Natuna (Dry container)
2016	\$ 248.88	\$ 373.32	\$ 124.01	\$ 186.04	-
2017	\$ 232.88	\$ 349.32	\$ 124.01	\$ 186.04	-
2018	\$ 232.88	\$ 349.32	\$ 124.01	\$ 186.04	-
2019	\$ 248.02	\$ 372.07	\$ 124.01	\$ 186.04	\$2488.06

Table 19 the Shipping Tariff of the Sea-Toll Road and non-Sea Toll Road
Source: Minister Transportation Regulation Number 133 in 2018

5.1.2 Conclusion Report

1. Aspect of Government and Institutional

	Policy quantity	Policy effectiveness	Policy coverage	Policy supervision
Sea-Toll Road in Natuna	Yearly around 3/year	Limited	Limited	Limited

Table 20 Result of Government and Institutional

2. Aspect of Economic

	Price disparity	Inflation rate	Economic Growth	Poverty level
Sea-Toll Road in Natuna	Reduce	Decrease But no correlation with the Sea-Toll Road	Decrease	Fluctuative/ tend to increase

Table 21 Result of economic aspect

3. Aspect of maritime function and service

	Freight Throughput	Port Integration	Logistics Integration	Transportation cost
Sea-Toll Road in Natuna	Decrease	Limited	Limited	Decrease

Table 22 Resultt of maritime function and service

In general, Sea-Toll Road is the most ambitious agenda of the Indonesia government to reduce the economic disparity condition through the inter-island connection. The Sea-Toll Road has brought a positive impact on both economic and maritime side. Nevertheless, the limitation policy coverage, such as the limitation of goods listed makes this program is ineffective. Moreover, due to regulation too centralistic, it occurs the regional government less participate and monitor the implementation of this policy.

In economic side the Sea-Toll Road has success decreasing the basic and essential commodity in remote, rural, outermost and borderland regions. For Natuna Island case, this program could reduce the commodity price around 14%. In contrast, this

policy is not directly could boost economic growth and decrease the poverty level. It is mandatory to support the Sea-Toll Road program by the establish the industry area in periperhal region.

On the other hand, for maritime function and service, Sea-Toll Road Program has decreased sea transportation significantly around 90% in Natuna Island. However, the Sea-Toll Road could not increase the total throughput because the less participation from local government, less of reefer container, and limited industry. Therefore, the port integration and logistic integration are limited as the Selat Lampa port only integrated with one industry. And the infrastructure acess makes a logistic integration not optimal yet.

5.2 Case 2 The Sea-Toll Road Project in Biak Numfor

Biak Numfor is one of regency island in eastern Indonesia which located under the administration of Papua province. This regency has a land and sea area of 15.124 km^2 with a land area of 2.602 km^2 and am ocean of 15.124 km^2 . By administration, the Biak Numfor regency government consist of 19 districts (Numfor Barat, Orkeri, Numfor Timur, Poiru, Bruyadori, Padaido, Aimando Padaido, Oridek, Biak Timur, Biak Kota, Samofa, Yendidori, Biak Utara, Andrey, Warsa, Yawosi, Bondifuar, Biak Barat, and Swandiwe).Biak Numfor regency are directly bordered with:

1. North side : Pacific Ocean and Supiori Regency
2. South side : Yapen Strait
3. West side : Manokwari Regency
4. East side : Pacific Ocean



Figure 51 Location of Biak Numfor Regency
Source: Google maps

Based on Indonesian Bureau Statistic (2018), the Biak Numfor is a regency with rich of marine natural resource and has tremendous marine tourism potential. By contrast, Biak Numfor is one of eastern archipelago in Indonesia with an extreme poverty, around 25,72% of Biak Numfor's people was living in poverty (Indonesian Bureau Statistic, 2018). It happens due to the geography condition as the one of rural area in Eastern and following another factor such as lack of industry, and human resource.

Biak has serviced by the Sea-Toll Road since 2016. Recently, Biak Numfor's Sea Toll route covered by T-8 Route directly from Tanjung Perak to Biak Numfor. Based on the government stipulation Tanjung Perak, Surabaya is the hub area of T-8 route and PT. Mentari Sejati Perkasa (private company) plays a role as the ship operator. The Sea- Toll Road's port activity is handling in Port of Biak. The status of this port is belonging by PT. Pelindo IV (state-owned company).



Figure 52 T-8 route
Source: Own illustration

In recent years, it is undoubtedly that the Sea-Toll Road program has success to reduce the disparity price in Biak Numfor, Papua province. Those commodities both basic and essential goods have declined about 8% in the last three years while the price gap between hub-area, Surabaya and Biak is about 15%.

To further detail about the impact of the Sea-Toll Road program, we will analyse the case in below based on our model.

1. Aspect of Government and Institutional

In implementing the Sea-Toll Road program in Biak Numfor Regency, we found there are 10 related regulations to the implementation of the Sea-Toll Road that have been released. Same as the policy in Natuna Island regency, those policies set up by central government level such as presidential, ministerial, and directorial general level. The average regulation update about 3 regulations per year. The rules that have been published such as Minister of Transportation Regulations Number 29 in 2018, Minister of Transportation Regulations Number 113 in 2018, Minister of Transportation Regulations Number, Minister of Transportation Regulations Number 23 in 2019, Minister of Transportation Regulations Number 89 in 2019, Minister of Trade Regulations Number 29 in 2017 with Presidential Decree Number 70 in 2017 as the main policy.

In contrast with Natuna Island, the Biak Numfor regency which stand under Papua province has a special autonomy that is not possessed by other regions. According to Constitution Number 21 in 2001, this province receives an extra budget of 2% from national allocation fund (DAN) in every year. However, we did not find any regional policy issued to support the Sea-Toll Road agenda.

In particular, the implementation of the Sea-Toll Road program in all Papua province is centralistic which all regulation issued by the central government agency such as the Ministry of Transportation and Ministry of Trade and the central board. Even though Papua province has a special autonomy, the regulation from maritime affairs are handled by the central government while the regional government only in charge of land affairs.

For the coverage content, the Sea-Toll Road encompasses the sea toll route tariffs, loaded freight, and technical operations. We also find, there is no regulation adjusts based on regional potency its self. As a result, it will bring an ineffective regulation due to less participant from the local government to promote and support this policy.

In the supervision side, even though 10 policies have been issued that are related to the Sea-Toll Road program in Natuna Island. By contrast, the supervision only monitored by the representative of central government such as Indonesia's Corruption Eradication Commission (KPK), Audit Board of Indonesia (BPK), Inspectorate General of Ministry of Transportation, and Inspectorate General of Ministry of Trade. Therefore, this phenomenon makes the regency government tough to monitor this project. By design, the participation of regional government like the Biak Numfor government are limited.

2. Aspect of Economic

According to the Directorate General of Domestic Trade, there has been a decrease in price disparities for the basic and essential commodity with an average of 8% from 2016 to 2019. For the gap price between Biak Numfor regency with hub-area in Tanjung Perak is around 16%. It occurs due to the limitation of the port facility and the high wages of stevedoring. As a result, a reduced logistic cost is not yet significant.

Commodity	Price reduction	Price gap with Hub area (Tj. Perak, Surabaya)
Rice	7,6%	5,58%
White Flour	11,1%	2,2%
Sugar	13,3%	14,5%
Vegetable oil	26,3%	16,3%
Cement	6,25%	41,7%

Table 23 Price reduction in Biak Numfor and gap price with hub-area
Source: (Trade, 2019)

From the economy side, the economic growth in the last 3 years are fluctuating and tend to decrease about 0,43%. The inflation data also shows that the inflation rate is low with average around 0,28%, which indicate the decreases people purchasing power in Biak Numfor area. It also means that the government expectation by implementing the Sea-Toll Road program to boost economic growth is not yet optimal. Based on the data from the Coordinating Ministry for Maritime Affairs (2019), the developing of industry and deep integration is the key to improve the economic growth in remote, rural, outermost and borderland regions.

Inflation in Papua	2016	2017	2018	2019* (until July)
	0,20%	0,27%	0,54%	0,14%
Economic growth in Biak	2015	2016	2017	
	4,53%	4,47%	4,04%	

Table 24 Inflation and economic growth in Biak
Source: (Indonesian Bureau Statistic, 2018)

Furthermore, the declining of disparity price that occurs in Natuna is insufficient to reduce the poverty percentage in Biak Numfor Regency. Even though the number of poor people in the last three years had declined, but the rate of poverty is extremely high, with an average of 26% in 2018. Based on that the Sea-Toll Road program does not effectively reduce the poverty level in Biak regency.

4. Aspect of maritime trade and service aspect

The servicing of Sea-Toll Road in Biak has begun in 2016 and covered by route T-8 with Tanjung Perak as the hub-area. Based on the table below, it can be seen the total freight from Tanjung Perak, Surabaya to Biak Numfor tend to increase significantly comparing by previous years. It rises around 84%. On the other hand, the loaded freight from Biak Numfor to Tanjung Perak is experienced with empty shipment from 2016 to 2018. This phenomenon occurs due to lack of participation of Biak Numfor government. Moreover, the less availability of reefer container also makes the goods from Biak Numfor to Tanjung Perak hardly to carry as the majority of goods are the marine product (Directorate of Sea Traffic and Transport, 2019). And

the uncertainty of the voyage schedule tends to make producer use the private operator to carry their product.

Route	Year			
	2016	2017	2018	2019* (until may)
Tj. Perak to Biak	40 Ton	43 Ton	35 Ton	220 Ton
Biak to Tj. Perak	-	-	-	5 Ton

Table 25 Total loaded from Tanjung Perak to Biak and vice versa
Source: Own elaboration from Directorate General of Sea Transportation (2019).

The majority of goods shipment from Tj. Perak to Biak Numfor

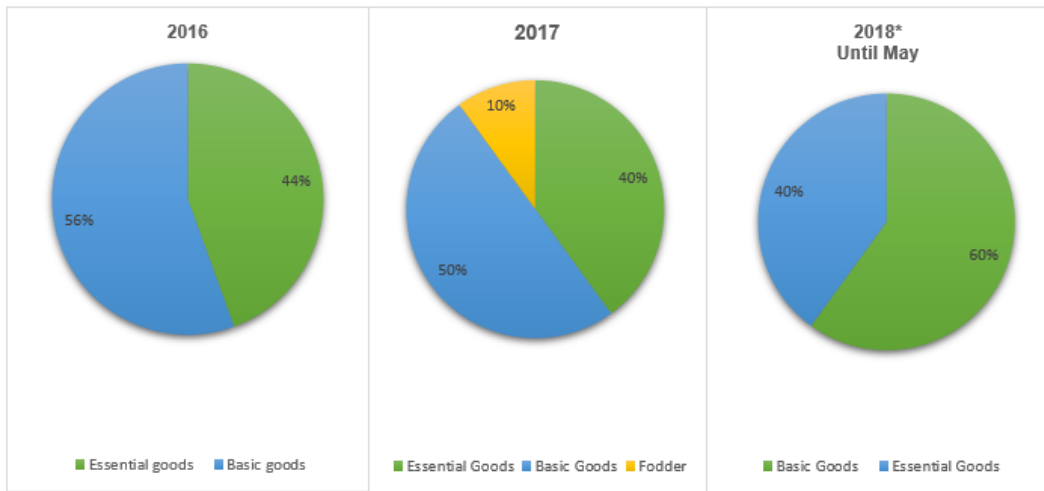


Figure 53 Majority of goods shipment from Tanjung Perak to Biak Numfor
Source: (Directorate of Sea Traffic and Transport, 2019)

Based on the pie chart above, the majority of the commodity that shipped to Biak Numfor was dominated by essential and basic commodity and slightly of fodder in 2017. Moreover, Biak Numfor regency also experienced the problem of limitation that goods that should carry ruled by the Sea-Toll Road regulation. It makes other imperative tools, especially industrial equipment, are expensive. In this situation, the revoke of goods limitation should be considered as mentioned by Zamal (2018) to make a route more attractive.

For port integration, the Biak port is not connected yet with industry area. However, in future years PT. Pelindo IV (state-owned company) plans (2019) to integrate with Sorong Special Economic Zone. Biak will act as the supplier of the raw commodity for Sorong industry area.

In the logistic side, as the status of Biak port is commercial and operated by PT. Pelindo IV. The condition of logistic integration such as road access to the city centre is far better comparing with a non-commercial port like in Natuna Island. However, the logistic problem in implementing the Sea-Toll Road occurs due to technical aspect

such as lack of logistic consolidation between regional government and ship operator in term to fulfil the freight slot.

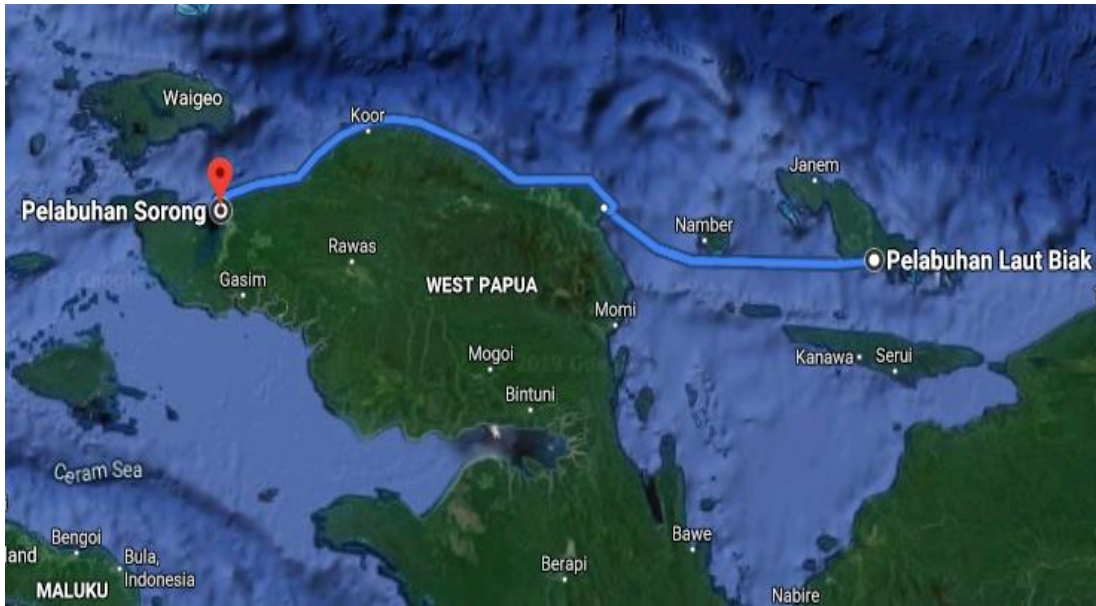


Figure 54 Distance between Biak Port to Sorong Special Economic Zone
Source: Google maps

In general, the Sea-Toll Road program has success to reduce the sea transportation cost about 67,8%. It can be seen from the table above that the Sea-Toll Road tariff is lower 74% than non-Sea-Toll Road tariff for the dry container while the reefer container is lower than 61,6%. The tariff remains the same since the commencement of this program

Year	Sea Toll Road Tariff				Non-Sea Toll Road Tariff	
	Tj. Perak-Biak (Dry container)	Tj. Perak-Biak (Reefer)	Biak- Tj. Perak (Dry container)	Biak- Tj. Perak (Reefer)	Tj. Perak-Biak (Dry container)	Tj. Perak-Biak (Reefer)
2016	\$ 456.06	\$ 684.08	\$ 456.06	\$ 684.08	-	-
2017	\$ 456.06	\$ 684.08	\$ 456.06	\$ 684.08	-	-
2018	\$ 456.06	\$ 684.08	\$ 456.06	\$ 684.08	-	-
2019	\$ 456.06	\$ 684.08	\$ 456.06	\$ 684.08	\$ 1782.02	\$ 1782.02

Table 26 Tariff between Sea-Toll Road and non-Sea-Toll Road
Source: (Ministry of Transportation, 2019)

5.2.1 Conclusion Report

1. Aspect of Government and Institutional

	Policy quantity	Policy effectiveness	Policy coverage	Policy supervision
Sea-Toll Road in Biak Numfor	Yearly around 3/ year	Limited	Limited	Limited

Table 27 Result of government and institutional aspect

2. Aspect of Economic

	Price disparity	Inflation rate	Economic Growth	Poverty level
Sea-Toll Road in Biak Numfor	Reduce	Decrease But no correlation with the Sea-Toll Road	Decrease	Decrease

Table 28 Result of economic aspect

3. Aspect of maritime function and service aspect

	Freight Throughput	Port Integration	Logistics Integration	Transportation cost
Sea-Toll Road in Biak Numfor	Increase	Limited	Limited	Decrease

Table 29 Result of maritime function and service aspect

As the maritime innovative project in Indonesia, the Sea-Toll Road has reduced the high disparity between Java Island and Eastern Indonesia through established the inter-island trade. In case of Biak Numfor Regency, the Sea-Toll Road has brought a positive impact on both economic and maritime side. However, there are some deficiency that makes this policy is not optimal yet. The limitation of policy coverage, centralistic policy makes a local government less participate and could not monitor the implementation of the Sea-Toll Road program.

In economic side the Sea-Toll Road has success decreasing the basic and essential commodity in remote, rural, outermost and borderland regions. For Biak Numfor Regency case, Sea-Toll Road has reduced the commodity price around 8%. On the other hand, this policy cannot not directly stimulate economic growth and decrease

the poverty level. The development industry area is mandatory in term to support the Sea-Toll Road program.

Furthermore, for maritime function and service, Sea-Toll Road Program has decreased sea transportation significantly around 67,8%% in Biak Numfor Regency. However, the Sea-Toll Road could not increase the total throughput because the less participation from local government, less of reefer container, and limited industry. Therefore, the port integration and logistic integration are limited as the Selat Lampa port only integrated with one industry. And the infrastructure access makes a logistic integration not optimal yet.

Chapter 6 Conclusion and Recommendation

This final chapter would provide the conclusions of the impacts of the sea toll road program to Indonesia's economy and maritime industry by summarising the sub-research questions one by one. Moreover, the study limitation and recommendation will also be discussed.

6.1 Key Findings

What is the history of the Sea-Toll Road Program in Indonesia?

The history of the Sea-Toll Road program begun through the commitment of the Indonesian government to reduce the economic disparity and boost the economic growth in remote, rural, outermost and borderland regions. By doing improvisation of maritime network based on The Presidential Decree Number 26 in 2012 (Indonesia's national logistical system) and Pendulum Nusantara's network that was issued in 2012 and combine with Nawacita platforms. Therefore, the Indonesian government issued The Presidential Decree Number 70 in 2017 (preceded by Presidential Decree Number 106 in 2015) as the main policy of the Sea-Toll Road program. Since the commencement in 2016, this program has made many improvement and expansion, such as increasing the budget double in 2018. Also, it continues to expand the network almost three times since 2016. Moreover, for the next midterm planning, this project will be integrated with several Indonesia's Special Economic Zone in order to increase the economic growth and settled the industrial area.

What is the implementation of the Sea-Toll Road in Indonesia?

Current situation of Sea-Toll Road implementation, this program is entirely handled by a central government agency like the Ministry of Transportation and Ministry of Trade. For the maritime networks, it regulates by Directorate General of Sea Transportation while trade and freight goods are handling by Directorate of Domestic Trade. Regarding the vessel operation in the Sea-Toll Road program, it operated by State-owned company and private company. Moreover, in the last two years, the government has also modified the subsidy system to not only subsidise ship operating costs but also to cover the cost of shipping containers. In general, the implementation of the Sea-Toll Road in all networks has succeeded in reducing economic disparity by decreasing the essential and basic commodities, while for logistic cost, it merely decreases the sea transportation cost.

What are the barriers of the implementation sea-toll road program in the field?

Regarding to the barriers in implementing this policy, there are several barriers which led this program underperforms. There are technical problems like uncertainty vessel voyage time, infective network, mismatch commodity, lack of promotion and socialisation to regional government, and some vessels are out of order. Moreover, the policy which entirely regulates by central government makes a regional government passively to participate and monitored this policy. However, the political issues also appear as the barrier to implementing the Sea-Toll Road program such as the lack of support from the opposition party to support government's maritime program.

How to measure the economic and maritime industry impact in the Sea-Toll Road program?

To measure the impact of Sea-Toll Road program on the economy and maritime industry in Indonesia, the multiple case study model was chosen. In this model, we use two objects of (Natuna Island & Biak Numfor Regency) as the representative of the remote, rural, outermost and borderland regions. Moreover, with three aspects (government & institutional, economic, and maritime service & function), we examine the extent of the impact of the Sea-Toll Road in the last three years on the economic and maritime industry conditions in Anambas Island and Biak Numfor Regency. Thus far, in the case of Natuna Island, the Sea-Toll Road has success to reduce the disparity of basic and essential commodities with around 14%. However, for other economic indicators such as economic growth and poverty, those indicators are not significantly impacted. In the maritime service and function, this program through subsidising has success to decline sea transportation by about 90%. Other indicators like freight throughput, port integration, and logistic integration still experience limited due to lack of coordination between the central government and regional government, limited infrastructure, limited of industry number. For the economic impact in Biak Numfor Regency, the Sea-Toll Road has decreased the commodity price (basic & essential) around 8% than before. By contrast, this policy is not significantly to improve other indicator like economic growth. In term of maritime impact, the most significant of this policy is reducing the sea transportation cost about 67,8% while other indicators not significantly impacted. The underperforming reason of this policy in Biak Numfor Island is quite similar in the case of Natuna Island as due to limited infrastructure, lack of coordination between central and regional administration, and not developed industry area.

6.2 Study Limitations

Based on this study we have found result of the economic and maritime Impact Indonesia's Sea-Toll Road Program in Indonesia. However, in this research model, the limitation still exists. Considering the limitation data and time, we could only choose two areas as the representative of the Sea-Toll Road program. This study might lead to limitation of result regarding to economic and maritime trade impact from the Sea-Toll Road program. During the process of data collection, we facing several barriers in finding required data for all cases.

6.3 Recommendations

Revisions the Regulation Concerning Goods Limitation

As we found on the result, the limitation that carry by the Sea-Toll Road ship has bring an ineffective of this policy. Other essential goods that not listed the price still high. However, those goods such as industrial equipment are imperative to support the development of industry level in a region. Hence, the government should consider to revision some points about goods limitation

The Role of Regional government

The less participation of regional government in supporting the Sea-Toll Road program has made the implementation of this policy become ineffective. It can be seen from the realisation of freight loaded returning to the hub-area where the total throughput tends to decrease. In the next implementation, it should be considered the central government should arrange an agreement to make a task force with the

regional government. The taskforce should concern about the logistic consolidation and monitoring of this policy.

Industrial Development

It is undoubtedly without an industrial area in the remote, rural, outermost and borderland regions it will be difficult to boost inter-island trade in Indonesia. For this sake, the government should immediately to establish an industry area based on its regional potency. Therefore, with the presence of an industrial zone, it will trigger an increases freight loaded to hub-area.

Infrastructure Development

The limitation of infrastructure has seriously become a major problem to increase port and logistic integration. In this case, the limitation of the road leg makes a reduction of disparity is not significant as public expecting. Therefore, the government should improve the infrastructure, especially in the landside to makes the distribution goods convenient.

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