

## Analysis of Benefits and Costs of Transferring Ports of Exports and Imports in Sumatra

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**Abstract**— The process of exports and imports in the Sumatra region that is carried out through several ports has resulted in the decrease of port's economies of scale and increase in costs. Efficiency will be obtained if the scale is high by focusing the process of exports and imports of the Sumatra region on the Kuala Tanjung Port. The port development requires an investment of IDR 43 trillion. Based on data in 2019, the decision to determine Kuala Tanjung Port as the only port for exports and imports activities in Sumatra would cause the port to handle exports of 62,607.90 thousand tons, equivalent to 2,871,922 TEU's. Meanwhile, the port imports volume will be 25,827.3 thousand tons, equivalent to 1,184,738 TEU's. The ports that have previously been the export gateways will become feeder ports. The related costs are the port investment cost which reaches IDR 43 trillion. Limiting the number of exports and imports gateway ports has the potential to benefit the central government, local government, shipping companies, and road transportation companies.

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**keywords**—exports, imports, costs, benefits, ports, Sumatra.

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### 1. Introduction

The Presidential Regulation Number 26 of 2012 concerning the Blueprint for the Development of the National Logistics System stipulates two international hub ports, namely Kuala Tanjung Port and Bitung Port [1]. The Kuala Tanjung Port should be optimized to support economic growth in the Sumatra region, especially for the export and import processes.

Currently, the export and import process for the Sumatra region is accomplished through several ports. The exports and import volumes which are divided into several ports have resulted in the decrease of ports economies of scale and increase in costs.

Efficiency will be obtained if the port's economies of scale are high by focusing the process of exports and imports of the Sumatra region on the Kuala Tanjung Port. As a port that is being prepared to become an international hub port, the port is located in a strategic location, which is in the middle of the Malacca Strait, the busiest trade route in the world, which is crossed by around 94,000 ships per year.

The port has a pool depth of -17 meters LWS and therefore it can accommodate large ships weighing up to 50,000 DWT as well as various types of cargo, from containers, liquid bulk, to general cargo.

The research calculates and analyzes the impact of the determination of Kuala Tanjung Port towards the ports of exports and imports gateways in Sumatra Island which are currently used.

### 2. Research Method

The study uses statistical calculations based on the data in 2019, including data on exports and imports of North Sumatra according to the primary goods category as well as the data on the volume of exports and imports through the main ports in the Sumatra region.

The volume of exports and imports in tonnage is converted into twenty-foot equivalent units (TEU's). A TEU is a measurement of volume in units of twenty-foot-long containers.

The research method used is the benefit and cost analysis. The costs analyzed are port investment costs and toll road construction costs as an access network between ports and economic and industrial centers. The benefit analysis is conducted to determine the benefits received by the related parties, including the central government, local government, and shipping companies.

### 3. Results

#### A. The Data

The Sumatra region has good economic growth and is the second-largest contributor to the Gross Domestic Product (GDP) after the Java region. In 2019, the region contributes to GDP by 21.32% and in 2020 by 21.36%.

The growth of the Sumatra region is supported by several commodities, especially plantation products and their derivatives. Most of its products and commodities are exported to several countries.

For example, Table 1 shows the development of North Sumatra's exports according to the categories of primary goods in 2019 [2].

Table 1. North Sumatra's Exports Development According to the Categories of Primary Goods in 2019

Categories of Primary Goods	FOB Value (000 USD)
Animal or Vegetable fats and oils	2,843,441
Rubber and its articles	1,081,318
Chemical Products	810,857
Coffee, Tea, Mate, and Spices	457,490
Tobacco	303,145
Organic Chemicals	332,091
Fruit and Nuts	175,502
Fish and Crustaceans	277,660
Soap, Organic Surface-Active Agents	279,360
Total of Wood and Articles of Wood	229,21
<b>Total</b>	<b>6,790,082</b>

Source: Central Bureau of Statistics of North Sumatra (2021)

Based on the table illustrated above, North Sumatra's primary export commodities are animal/vegetable fats and oils, which in 2019 reached USD 2.843 billion, followed by rubber and rubber goods (USD 1.081 billion), and chemical products (USD 810 million).

On the other hand, the Sumatra region imports various goods as shown in Table 2.

Table 2. North Sumatra's Imports Development According to the Categories of Primary Goods in 2019

Categories of Primary Goods	CIF Value (000 USD)
Mineral Fuels	490,482
Machinery and Mechanical Appliances	614,366
Electrical Machinery and Equipment	236,366
Food Industries, its Residues, and Wastes	313,488
Plastics and its articles	301,785
Inorganic Chemical	265,355
Iron and Steel	220,814
Fertilizers	154,154
Cereal	172,034
Rubber and its articles	173,074
<b>Total</b>	<b>2,941,919</b>

Source: Central Bureau of Statistics of North Sumatra (2021)

North Sumatra's main import commodities are machinery/aircraft, which in 2019 reached USD 614,366 million, followed by mineral fuel mechanics from rubber (USD 490,482 million), and food industry waste (USD 313,488 million).

The export and import activities of the Sumatra region are carried out through several ports. The volume of exports through the main ports on Sumatra Island in 2019 is illustrated in Table 3 [3].

Table 3. Export Volume Through Main Ports on Sumatra Island in 2019

No.	Province	Main Port	Volume (thousand tons)
1	Aceh	Blang Lancang (Arun)	16.3
2	North Sumatra	Belawan	7,944.0
3	North Sumatra	Pangkalan Susu	0.1
4	West Sumatra	Padang/Teluk Bayur	4,610.5
5	Riau	Dumai	18,881.2
6	Riau	Pakanbaru/Rumbai	137.1
7	Riau Islands	Batu Ampar	1,040.9
8	Riau Islands	Sekupang	459.3
9	Riau Islands	Tanjung Pinang	563.3
10	Riau Islands	Kabil/Panau	2,872.6
11	Riau Islands	Sambu Island	565.9
12	South Sumatra	Palembang-Plaju	714.2
13	South Sumatra	Palembang (Kertapati)	805.3
14	South Sumatra	Musi River/Boom Baru	20,506.1
15	Lampung	Panjang	3,491.1

Source: Central Bureau of Statistics (2021)

The maximum weight of a 20 feet container is 21,800 kilograms, so the total volume of exported cargo is 113,808.3 thousand tons, equivalent to 5,220,564 TEU's.

Meanwhile, the volume of imports through the main ports on Sumatra Island in 2019 is shown in Table 4.

Table 4. Import Volume Through Main Ports on Sumatra Island in 2019

No.	Province	Main Port	Volume (thousand tons)
1	North Sumatra	Belawan	5,785.2
2	Riau	Dumai	0
3	Riau	Perawang, Sumatra	2,520.5
4	South Sumatra	Musi River/Boom Baru	1,060.7

No.	Province	Main Port	Volume (thousand tons)
5	Lampung	Kota Agung	0
6	Lampung	Panjang	1,936.2
7	Riau Islands	Pulau Sambu	0
8	Riau Islands	Tanjung Uban	0
9	Riau Islands	Batu Ampar	1,774.2
10	Riau Islands	Sekupang	605.2
11	Other Regions in Sumatra		12,145.3
		<b>Total</b>	<b>25,827,3</b>

Source: Central Bureau of Statistics (2021)

The maximum weight of a 20 feet container is 21,800 kilograms, so the total volume of imported cargo is 25,827.3 thousand tons, equivalent to 1,184,738 TEU's.

The Kuala Tanjung Port is a seaport that is currently under construction in Batu Bara Regency, North Sumatra, Indonesia. The Kuala Tanjung Port is in the middle of the Malacca Strait, the busiest trade route in the world, which is traversed by around 94,000 ships per year. The port which is designated as an international hub has a pool depth of -17 meters LWS and therefore it can accommodate large ships weighing up to 50,000 DWT as well as various types of cargo, from containers, liquid bulk, to general cargo [4].

The Kuala Tanjung Port is connected via the Trans-Sumatra toll road network and rail with the Kuala Tanjung Industrial Zone (KTIZ). Besides, Kuala Tanjung is also connected to the Sei Mangkei Special Economic Zone (KEK), which is the center for palm oil-based industries in northern Sumatra.

### B. Analysis of Costs

The port establishment as a physical infrastructure requires a large investment. The investment cost of the Kuala Tanjung Port, including a multipurpose terminal and industrial estate, reaches IDR 43 trillion.

The port must be supported by a road network that connects the port with economic and industrial centers. The toll road on Sumatra Island is the Trans-Sumatra toll road with an estimated investment of IDR 476 trillion [5,7].

Currently, the construction of toll roads in Sumatra from Lampung Province to Aceh with a length of 2,987 kilometers is undergoing and until February 2021 it has been operating for 653 kilometers consisting of 9 toll roads [6]. The Trans-Sumatra toll road (JTTS) consists of the main corridor (backbone) of 2,069 km and a supporting corridor (fin) of 919 km, which is targeted to be fully operational by 2024.

Those nine toll roads are: (1) Bakauheni-Terbanggi Besar, (2) Terbanggi Besar-Kayu Agung, (3) Kayu Agung-Palembang-Betung, (4) Belawan-Medan-Tanjung Morawa, (5) Medan-Binjai, (6) Medan-Kualanamu-Tebing Tinggi, (7) Palembang-Indralaya, (8) Sigli-Banda Aceh (Seksi 4), and (9) Pekanbaru-Dumai.

The Trans-Sumatra toll road will open up many lucrative opportunities. The more job opportunities open up so that it absorbs a lot of labor, business activities can be carried out at competitive costs with other provinces, and further with other countries.

The Sumatra region contributed 21.32 percent to the GDP in 2019 and in 2020 contributed by 21.36 percent.

To enhance the contribution to GDP, the region can stimulate the export volume of regional superior commodities with the support of efficient ports.

### C. Analysis of Benefits

Limiting the number of exports and imports gateway ports has the potential to provide benefits for several parties as follows:

#### a. Central Government

The establishment of the port of entry for exports and imports will contribute to improving the economy and distribution of GDP in Indonesia, especially in areas with the low contribution to GDP, namely Sulawesi (6.66%), Bali and Nusa Tenggara (2.94%), as well as Maluku and Papua (2.35%).

#### b. Local Government

The establishment of the port of entry for exports and imports has the potential to generate benefits for the local government in advancing the economic growth and the competitiveness of the local potential commodity exports.

#### c. Shipping Companies

The establishment of the port of entry for exports and imports has the potential to increase the necessity for sea transportation from the port to several final destination ports on the other islands.

It impacts the activities and income of domestic shipping companies, as well as shipping support industries such as shipbuilding.

Road transport companies will also increasingly play a role as hinterland transport operators between ports and economic and industrial centers.

## 4. Conclusion

The process of exports and imports in the Sumatra region that is carried out through several ports has resulted in the decrease of ports economies of scale and increase in costs.

Efficiency will be obtained if the scale is high by focusing the process of exports and imports of the Sumatra region on the Kuala Tanjung Port.

As a port that is being prepared to become an international hub port, the port is located in a strategic location and has a good physical condition as an exports and imports port for the Sumatra region.

With the decision to determine Kuala Tanjung Port as the only port for export activities in the Sumatra region, the port will have to handle exports of 62,607.90 thousand tons, equivalent to 2,871,922 TEU's. Meanwhile, the port imports volume will be 25,827.3 thousand tons, equivalent to 1,184,738 TEU's.

The related costs are the port investment cost which reaches IDR 43 trillion.

Limiting the number of exports and imports gateway ports has the potential to benefit the central government, local government, and shipping companies.

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