
Effect of Freight Transportation for Regional Development in the North Zone of Aceh

Effect of
Freight
Transportation
for Regional
Development

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Abstract

Purpose – This study aims to analyze and assess the relation of freight transportation for regional development in the north zone of Aceh. The impact of freight transportation to accelerate the delivery of goods as observed through several indicators including regulation, retribution, freight entrepreneur, trucker, size of truck bin, punctuality, loading and unloading systems on regional planning supporting has been focus of this study.

Design/Methodology/Approach – The freight transportation in north zone of Aceh, covering Lhokseumawe, Aceh Utara, Bireuen, BenerMeriah and Aceh Tengah regencies will be examined. In several indicators including regulation, retribution, freight entrepreneur, trucker, size of truck bin, punctuality, loading and unloading systems the freight transportation will be surveyed for the analysis. The factors which contribute in the development of the area through freight transportation are the economic growth, human resources improvement, management of land use and environmental harmonization. This regional development approach aims to determine a connection between the two variables.

Findings – The results of the study show that variables of freight transportation in several indicators including regulation, retribution, freight entrepreneur, trucker, size of truck bin, punctuality, loading and unloading systems have a significant impact on regional development. It is indicated by the value of 0.214 in the regression weight result.

Research Limitations/Implications – This research has implications on the relation of freight transportation with regard to several indicators including regulation, retribution, freight entrepreneur, trucker, size of truck bin, punctuality, loading and unloading systems on the regional development based on the aspect of economic growth, human resources improvement, management of land use and environmental harmonization.



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Practical Implications – The result of this study will be an important input to the Aceh government, county and city governments in the north zone in Aceh to encourage the establishment of a road network to accelerate freight transportation in that region for the development of new economic zones.

Originality/Value – This study suggests that freight transportation has the strongest links to significantly influence the activities of regional development, so it can be recommended for the Aceh government, county and city governments in the north zone of Aceh to orient road network policy towards the development of the new economic area and support the implementation of the special economic zones of Arun, Lhokseumawe.

Keywords Freight transportation, regional development, north zone of Aceh

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1. Introduction

Aceh is one of the provinces in Indonesia which has the status of special autonomy in 2001 according to regulation No. 18 on Special Autonomy for the Province of Nanggroe Aceh Darussalam (Indonesia Government Regulation No. 18 of 2001). Currently, Aceh is highly dependent on the province of North Sumatra, not only in the aspects of road transportation through the highway network, but also in almost of all aspects of Aceh's economy.

The central government and the government of Aceh have made an effort to improve the road network linking the northern coast corridor which includes the city of Lhokseumawe, Aceh Utara and Bireuen regencies with central corridor consists of four districts in the highlands – the Central Aceh, Bener Meriah, Gayo Lues, and Southeast Aceh. Construction of this road network is to facilitate transport in the central part of the corridor North Aceh and open inland.

Lhokseumawe is a National Centre of Activities (NCA) in the Aceh region that provides the flow of people, goods and services from exterior region into the city of Lhokseumawe or vice versa, domestically and internationally (Fithra et al.). NCA is centered in Lhokseumawe City and part of Aceh Utara Regency which serves as a national, regional and international service center supported by Lhokseumawe Industrial Estate, Lhokseumawe Port and Malikussaleh Airport (located in Aceh Utara District area which is a support area of Lhokseumawe NCA) (Department of Transportation, Communications, Information and Telematika GoA, 2011; Fithra, Sirojuzilam, and Erlina, 2017).

In order to accelerate economic growth in Lhokseumawe and Aceh Utara District areas as well as supporting the acceleration and expansion of national economic development, it is necessary to develop Lhokseumawe City and Aceh Utara District as a Special Economic Zone of Arun, Lhokseumawe (KEKAL). Decision of KEKAL Lhokseumawe is in accordance with Government Regulation No. 5 Year 2017, where the area of Arun Lhokseumawe has geoeconomic and geostrategic potential and advantages (Indonesian Government Regulation No.5 of 2017).

2. Method

This study will analyze the existing freight transportation connectivity in North Zone of Aceh, covering Lhokseumawe, Aceh Utara, Bireuen, Bener Meriah and Aceh Tengah regencies. The freight transportation will be examined in several aspects including regulation, retribution, freight entrepreneur, trucker, size of truck bin, punctuality, loading and unloading systems.

The factors which affect the development of the area with existing freight transportation connectivity are based on the economic growth, human resources improvement,

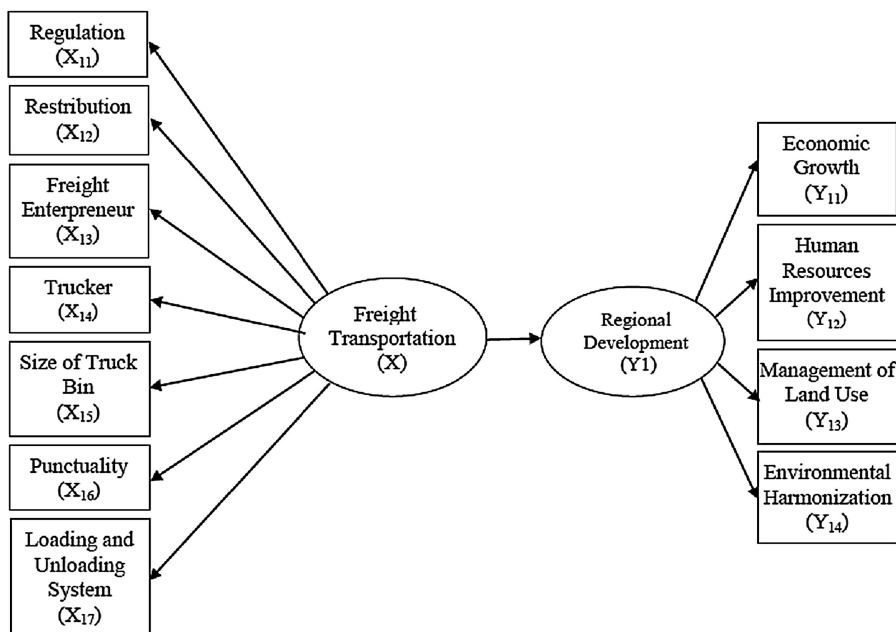


Figure 1. Conceptual Framework of Research

management of land use and environmental harmonization. This regional development approach aims at determining a connection between the two variables. Figure 1 is a conceptual framework of the research (Bagozzi, 1994).

2.1. Research design

This study is an explanatory research, which is conducted by explaining the symptoms caused by an object of the researcher that aims to explain the causality connection to seek a relationship between freight transportation and regional development in the north zone of Aceh (Chourmain, 2008).

The population of the north zone of Aceh was considered for the study which is as many as 1,547,832 inhabitants (2015). Table 1 shows the samples selected from each city and regency in the North Zone of Aceh (The Central Statistics Agency (BPS) of Aceh province, 2016; The Central Statistics Agency (BPS) Lhokseumawe, 2016; The Central Statistics Agency (BPS) Central Aceh District, 2016; The Central Statistics Agency (BPS) North Aceh district, 2016; The Central Statistics Agency (BPS) BenerMeriah, 2016; The Central Statistics Agency (BPS) Bireuen, 2016).

No.	Regency	Population	Sample
1	Lhokseumawe	191,407	37
2	Aceh Utara	583,892	113
3	Bireuen	435,300	89
4	Bener Meriah	136,821	27
5	Aceh Tengah	200,412	39
Total		1,547,832	300

Table 1. Population and Sample from Each Regency

2.2. Freight transportation variable (X_1)

In a regional development process, the transportation system is one of the most important factors. A well-managed transportation system allows for smooth flow of goods and services that are mandatory for the regional growth and development (Mishra and Welch, 2012).

Moreover, transportation development will act as a catalyst in expanding the marketing and services to support the growth of various sectors of socio-economic activities, in every zone. In other words, the transportation system (infrastructure) plays a crucial role as an element that connects separate points in space with different mechanisms of activities which might be interdependent on one another (Behdani et al., 2016; Fithra, Saleh, and Erlina 2017).

2.3. Regional development variables (Y_1)

Regional development is defined operatively as an effort to spur socioeconomic development in association with spatial and regional arrangements to reduce inter-regional disparities and to preserve the environment of a region that emphasizes on strengthening endogenous factors (economic growth, human resources improvement, management of land use and environmental harmonization) as a drive of the region's competitiveness.

3. Results and discussion

3.1. Reliability test

A reliability test is used to determine the consistency of measurement tools in order to gain confidence. Reliability means the consistency of the results when tested against different samples of the population. A common method used for reliability testing is the Cronbach alpha method which is available in the SPSS program. The questioner is considered reliable if the Cronbach alpha values are greater than 0.6. The reliability test results for the freight transportation variable (X) and the regional development variable (Y_1) are shown in Tables 2 and 3.

The data in the Tables 2 and 3 show that all indicators measuring or forming the freight transportation variable (X) and the regional development variable (Y_1) are reliable or trusted in measuring each representative indicator.

Table 2.
Reliability of Test
Results of Freight
Transportation (Y_1)

Variables	No.	Indicator	α (alpha)	Requirement	Information
Freight Transportation (X_1)	1	Regulation	0.714	> 0.60	Valid
	2	Retribution	0.725	> 0.60	Valid
	3	Freight Entrepreneur	0.699	> 0.60	Valid
	4	Trucker	0.720	> 0.60	Valid
	5	Size of Truck Bin	0.711	> 0.60	Valid
	6	Punctuality	0.722	> 0.60	Valid
	7	Loading and Unloading Systems	0.720	> 0.60	Valid

Table 3.
Reliability of the Test
Results Freight
Transportation (Y_1)

Variables	No.	Indicator	α (alpha)	Requirement	Information
Regional Development (Y_1)	1	Economic Growth	0.701	> 0.60	Valid
	2	Human Resources Improvement	0.720	> 0.60	Valid
	3	Management of Land Use	0.728	> 0.60	Valid
	4	Environmental Harmonization	0.713	> 0.60	Valid

3.2. *Confirmatory Factor Analysis (CFA) of freight transportation variables*

The confirmatory factor analysis of the latent variables of freight transportation was done to confirm all the indicators forming the latent constructs. The data processing for CFA of freight transportation is shown in Figure 2 (Anderson and Gerbing, 1988; Bagozzi, and Yi, 1989).

Result analysis of CFA also confirms that the CFA models for freight transportation fit well. All the indicators are confirmed valid and reliable to measure freight transportation variables. The trucker indicator has the highest loading factor while the freight transportation entrepreneur has the second highest loading factor. The CFA results of the freight transportation variables are shown in Table 4.

3.3. *CFA of regional development variables*

The analysis of the confirmatory factor in the latent variables of area development is carried out to confirm all the indicators that constitute the latent construction of regional development. The results of CFA can determine whether the CFA model for regional development is fit or not. Figure 3 shows the results of data processing and the confirmatory analysis of regional development.

From the results of CFA known, the CFA model is considered fit for the development of the region. All indicators are declared valid and are believed to measure the variables of regional development. The economic growth indicator is the greatest factor loading factor

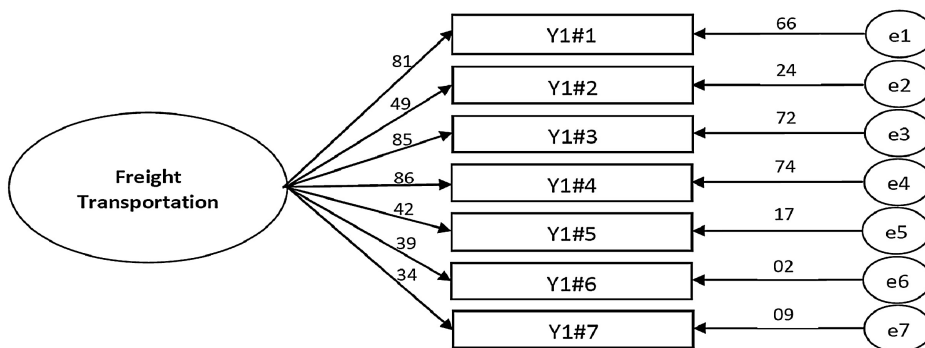


Figure 2.
Confirmatory
Analysis of Freight
Transportation

Standardized Regression Weights: (Group number 1 – Default model)

			Estimate
$Y_1 \neq 1$	◀-----	Freight Transportation	0.809
$Y_1 \neq 2$	◀-----	Freight Transportation	0.494
$Y_1 \neq 3$	◀-----	Freight Transportation	0.851
$Y_1 \neq 4$	◀-----	Freight Transportation	0.858
$Y_1 \neq 5$	◀-----	Freight Transportation	0.418
$Y_1 \neq 6$	◀-----	Freight Transportation	0.385
$Y_1 \neq 7$	◀-----	Freight Transportation	0.341

Table 4.
Variable Output
Analysis CFA for
Freight
Transportation

Source: Results of analysis.

and subsequent environmental protection. The output results of the CFA for the region development variables is shown in Table 5.

All indicators suggested to form freight transportation variables are declared valid and trusted because their loading factors are greater than 0.60. The influence coefficient is calculated using regression weight and will be used as a baseline to answer the research hypothesis. The results of the data processing are shown in Table 6.

The regression weight result indicates the significant influence of each variable that impacts the freight transportation in the north zone of Aceh. Freight transportation also significantly affected the smooth flow of the regional planning in the north zone of Aceh. Table 6 indicates that the obtained significant value is p (0.008), which is within the standard $p < 0.05$. It denotes that freight transportation has a strong relationship and significantly affects the regional planning activities and successfulness in the north zone of Aceh. Freight transportation has a significant contribution on the successfulness of regional planning activities and amounts to a value of 0.214. It can be concluded that freight transportation has significant impacts on regional planning based on economic growth, human resources improvement, management of land use and environmental harmonization.

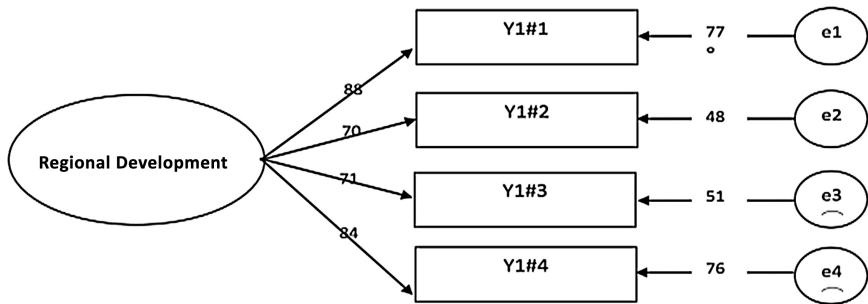


Figure 3.
Confirmatory
Analysis Regional
Development

Standardized Regression Weights : (Group number 1 - Default model)

Table 5.
Variable Output
Analysis of CFA of
Regional
Development

			Estimate
$Y_1 \neq 1$	←-----	Regional Planning	0.882
$Y_1 \neq 2$	←-----	Regional Planning	0.695
$Y_1 \neq 3$	←-----	Regional Planning	0.712
$Y_1 \neq 4$	←-----	Regional Planning	0.835

Source: Results of analysis.

Table 6.
Regression Weight

Relationships between variables		Estimate	p	Result	
Freight Transportation	-----▶	Regional Development	0.214	0.008	Significant

Source: Data Processing.

4. Conclusion

The effect of freight transportation for regional development in the north zone of Aceh was presented. Freight transportation variable (X) is constructed from seven different indicators such as regulation, retribution, freight entrepreneur, trucker, size of truck bin, punctuality, loading, and unloading systems. The result analysis proved that these indicators are valid and reliable to measure the effect of freight transportation. The regional development variable (Y_1) is determined from the regulation of economic growth, human resources improvement, management of land use and environmental harmonization indicators. These indicators are also valid and reliable to measure the effect of regional development. Therefore, freight transportation has a significant impact on regional development.

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