The Effect Of Transportation On Regional Economic Development In Aceh Tamiang Regency

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Abstract.
This research seeks to identify and explain the impact of transportation on regional economic development in the Aceh Tamiang Regency. This quantitative study relies on secondary data from the Central Statistics Agency (BPS) of Aceh Tamiang Regency for the years 2013 to 2021. The method of data analysis is executed using the collected secondary data, which is first processed to determine the value of each variable. After collecting the data, it is tabulated so it can be analyzed using correlation and regression statistics to test the proposed hypotheses. According to the findings of this study, the calculated F of the output is 12.357 > 5.79, indicating that the length of the road and the number of vehicles have no significant effect on the growth of regional income in Aceh Tamiang Regency. In other words, the length of the road and the number of vehicles have no significant effect on employment opportunities in the Aceh Tamiang Regency, as determined by the F test.

Keywords : *Regional Economic Development and Transportation.*

I. INTRODUCTION

According to Satmiko (2018), transportation acts as a supporter, promoter, and propelling force for regional or regional growth in order to increase and distribute development and its outcomes [7]. According to Andriansyah (2015), economic development requires sufficient and adequate transportation services; without transportation facilities as a support, economic development initiatives in a region cannot be anticipated to yield satisfactory results. In each region, regardless of the degree of economic development, it is necessary to ascertain in advance the destinations that require transportation services within the framework of constructing a transportation system [1].According to Sakti (2011), the development of remote regions requires transportation infrastructure (roads) in order to be accessible. The opening of previously isolated regions will contribute to a rise in economic and commercial activity, thereby creating the conditions for a rise in human welfare. The primary goal of infrastructure development is to provide infrastructure and development services that support production activities, increase exports, and expand employment and business opportunities, particularly for economically disadvantaged groups [5].Regional disparities in social welfare must be eliminated and minimized as much as feasible. In addition to creating economic unity and a more robust economic structure, one of the goals of regional development is to reduce inter-regional and intra-regional tensions in terms of social welfare and equalize inter-regional and intra-regional growth rates. Regional development is crucial for a nation comprised of numerous regions that differ in terms of geography, demography, potential and current state of economic, institutional, and technological resources.Transportation has a tremendous impact on regional economic development in Aceh Tamang Regency.

Given its function as a tool for moving or transporting goods and people from one place to another with a specific purpose, transportation cannot be separated from human life as long as it is needed in the distribution of materials, the movement of human activities and the micro components of an economy.In Aceh Tamiang Regency, the road network and public transportation routes continue to expand each year. It has not, however, been accompanied by the availability of the fleet, and the condition of the extant terminal does not appear to be conducive. Thus, the development of this transportation network will indirectly reduce the isolation of previously inaccessible areas via public transportation. It is anticipated that the acquisition and construction of infrastructure and transportation facilities in Aceh Tamiang Regency will assist in reducing the border regions' isolation, remoteness, and backwardness. Isolated areas are areas that have not been accessed by transportation services due to the lack of available transportation facilities, despite their

proximity to activity/service centers. Remote areas are those that are extremely distant from activity/service hubs and lack access to transportation services. Underdeveloped areas are regions that have a low standard of living because they lack superior economic resources and have limited access to transportation infrastructure. According to Erlina (2011), the theoretical framework will theoretically correlate the research variables, specifically the independent and dependent variables. Similarly, if other variables accompany it, the function of these variables must be clarified.

If the study links two or more variables, a theoretical framework must be presented. If there is only one independent variable in the research, it is necessary to provide a hypothesis for each variable as well as variations in the magnitude of the studied variables [4].This study aims to explain and disclose the impact of transportation development on regional economic growth. In this investigation, transportation is restricted to infrastructure (road length) and facilities. (number of vehicles). With adequate and well-maintained facilities and infrastructure, people will be able to travel and be mobile both within and beyond the area under study. The ability of the workforce to work in available sectors in the Aceh Tamiang Regency will be facilitated by the freedom of movement and access to an expanding community's income.With an increase in people's income and the creation of employment opportunities, the regional economy will grow, which will result in regional development in the Aceh Tamiang Regency Region. In this instance, regional development is viewed from two perspectives: increasing regional income and expanding employment opportunities for the community.The purpose of this study is to analyze the effect of road length on increasing regional income in Aceh Tamiang Regency; analyze the effect of the number of vehicles on increasing regional income in Aceh Tamiang Regency; analyze the effect of road length on employment opportunities in Aceh Tamiang Regency; and analyze the effect of the number of vehicles on employment opportunities in Aceh Tamiang Regency. The hypotheses in this study are: Road length has a positive effect on regional income in Aceh Tamiang Regency; the number of vehicles has a positive effect on regional income in Aceh Tamiang Regency; and the length of the road has a positive effect on employment opportunities in Aceh Tamiang Regency.

II. METHODS

The location of this research is Aceh Tamiang Regency. This research data only uses and relies on secondary data sources. These data were obtained through the Aceh Tamiang Regency Central Bureau of Statistics (BPS), Aceh Tamiang Regency Public Works Office, Aceh Tamiang Regency Transportation Service, Aceh Tamiang Regency Manpower and Transmigration Service, as well as relevant literature and research results to support the discussion of this research. . All of these data were collected over a span of 5 (five) years, namely from 2010-2018 [2] [3].To test the hypothesis regarding the effect of road length and number of vehicles on increasing regional economic income, product moment correlation analysis and regression estimation are used. To process the data in this study, computer assistance was used using SPSS Statistics 22 software [4].

III. RESEARCH RESULT

Aceh Tamiang is a municipality within the Nanggroe Aceh Darussalam province. Aceh Tamiang is situated in the eastern portion of the Province of Nanggroe Aceh Darussalam, along the province's border with North Sumatra. The administrative area of the Aceh Tamiang Regency was divided into 12 sub-Regencys and 213 villages in 2007, resulting in a total of 12 sub-Regencys and 213 villages. Aceh Tamiang is bordered by the Malacca Strait to the north, Gayo Lues Regency to the south, Langkat to the east, and Langsa City to the west. Based on RI Law No. 4 from 2002**,** Aceh Tamiang Regency was formally established.

3.1. The effect of road length and number of vehicles on increasing regional income

To answer the first research hypothesis, namely regarding the length of the road and the number of vehicles that have a positive effect on increasing regional income in Aceh Tamiang Regency, it is further processed using multiple linear regression analysis techniques, using the help of SPSS Statistics 22 software.

As shown in the table below, the output results of multiple linear regression illustrate the correlation relationship between the research variables.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Path length after weighting	9	2304.23	3350.03	2900.8547	399.53616
Number of Vehicles Based on SMP	9	13993.50	21638.50	16938.7222	2714.56142
GRDP	9	4706.82	10243.27	6146.0651	1773.54110
Valid N (listwise)	9				

Correlations

		The length of the road is good after weighting the Number of Vehicles by SMP	The length of the road is good after weighting the Number of Vehicles by SMP	GRDP
Path length after weighting	Pearson Correlation	1	-.314	-.382
	Sig. (2-tailed)		.410	.310
	N	9	9	9
Number of Vehicles Based on SMP	Pearson Correlation	-.314	1	.891**
	Sig. (2-tailed)	.410		.001
	N	9	9	9
GRDP	Pearson Correlation	-.382	.891**	1
	Sig. (2-tailed)	.310	.001	
	N	9	9	9

**. Correlation is significant at the 0.01 level (2-tailed).

In accordance with the aforementioned provisions, the correlation between road length and GRDP is displayed in the sig column. Probabilities with two tails are obtained. It was determined that the pair of variables, road length and GRDP, exhibited an insignificant correlation (probability 0.410 > 0.05). While the number of vehicles with GRDP has a significant correlation (probability = 0.001 0.05), the correlation is not statistically significant. It can be concluded from these results that the independent variable road length has no significant relationship with the dependent variable GRDP, whereas the independent variable number of vehicles has a significant relationship with GRDP.

In addition, the following information is obtained from the output of multiple linear regression:

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Number of Vehicles Based on SMP, Length of road after weighting[b]	.	Enter

a. Dependent Variable: PDRB
b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.897[a]	.805	.740	905.13404

a. Predictors: (Constant), Number of Vehicles Based on SMP, The length of the road is good after weighting

Based on the output of multiple linear regression, an R Square number of 0.805 is obtained. This shows that 80.50% of GRDP is affected by the increase in road length and number of vehicles. While the remaining 19.50% is influenced by other variables. In other words, it can be said that the length of the road and the number of vehicles have a significant effect on GRDP with a significance of 80.50%, while the other variables are only 19.50%.

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20247978.673	2	10123989.337	12.357	.007[b]
	Residual	4915605.728	6	819267.621		
	Total	25163584.401	8			

a. Dependent Variable: PDRB

b. Predictors: (Constant), Number of Vehicles Based on SMP, The length of the road is good after weighting

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1857.425	3707.003		-.501	.634
	Path length after weighting	-.503	.844	-.113	-.596	.573
	Number of Vehicles Based on SMP	.559	.124	.855	4.498	.004

a. Dependent Variable: PDRB

Furthermore, ANOVA analysis is carried out using the hypothesis:

H_0 = Road length and number of vehicles have no effect on GRDP.

H_1 = Road length and number of vehicles affect GRDP.

From the results of the Anova test or F test, it is obtained that the F count is 12,357, with a significance level of 0.007. because the probability of 0.007 is less than 0.05, then H_0 is rejected, then H_1 is accepted, in other words the length of the road and the number of vehicles affect GRDP.

Apart from that, this F test decision making method can also be done by comparing F count with F table, with the condition: if the calculated statistics (F output numbers) > F table statistics, then H_0 is rejected. Conversely, if the statistical count (output F numbers) < table F statistics, then H_0 is accepted. F count of the output is 12.357 > 5.79 with a significance level (5%) (see Appendix F table). So it can be concluded that together there is a significant relationship between the independent variables namely; road length and number of vehicles to the dependent variable (GRDP)

Furthermore, the regression equation can be made as follows:

Ý = -1857.425 + -0.503 X1 + 0.559 X2

R^2 = 0.740

F_count = 12.357

Where:

Ý = GRDP

X1 = Road length, t_count -0.573

X2 = Number of Vehicles, t_count 4,498

Based on the equation above, it can be explained that a constant of -1857.425 states that if there is no increase in the length of the road and the number of vehicles, the GRDP will decrease by IDR 1857.425 (in billions). The regression coefficient for the length of the road is -0.503 which states that for every road length added by 1%, the GRDP will decrease by IDR 0.503 (in billions). Conversely, if the road length is reduced by 1%, the GRDP will increase by IDR 0.503 (in billions).

Furthermore, the regression coefficient for the number of vehicles of 4.498 states that if the number of vehicles is added by 1 SMP, the GRDP will increase by IDR 4,498 (in billions). Conversely, if the number of vehicles decreases by 1 SMP, the GRDP will decrease by IDR 4,498 (in billions).

From the regression equation above, the t test can then be carried out, to test the significance of the constants and the dependent variable (GRDP). The t test was conducted to predict the influence of road length and number of vehicles on GRDP, with the following conditions:

H_0 = The regression coefficient has no significant effect

H_1 = The regression coefficient has a significant effect

Based on probability, if probability > 0.05 then H_0 is accepted, and if probability < 0.05, then H_0 is rejected and H_1 is accepted. From the sig column. (significance) it can be seen that there is a constant coefficient which is significant and not significant to GRDP. Or a constant value of 0.634, the significance of the road length is 0.573, the two coefficient values are greater than 0.05. While the significance of the number of vehicles is 0.004 which is less than 0.05, meaning that the number of vehicles has a constant coefficient that is significant to GRDP.

3.2. Effect of Road Length and Number of Vehicles on Job Opportunities

According to the results of the preceding statistical calculations, data pertaining to 80.50 percent of GRDP is affected by the increase in road length and vehicle count. The remaining 19.50% of the total variance is affected by additional variables. In other words, the length of the road and the number of vehicles substantially contribute to the formation of GRDP in the Tamiang Regency of Aceh. Significant effect with a significance of 80.50 percent. Other variables influence 19.50% of the GRDP formation in the region. Other variables affecting the GRDP in Aceh Tamiang Regency are influenced by economic variables. Price stability, public service factors, purchasing power, etc. are examples.When calculating the regional gross domestic product, a number of factors are known to contribute to the growth of a region's economy. (GRDP). In addition to the 17 (seventeen) indicators as stated in the GRDP calculation concept which has been presented in Table 4.5 and Table 4.6, many other factors also play a role in influencing the GRDP of a region, such as the political situation, security issues, socio-cultural conditions found in the local community, etc.In growing the economy of a region, theoretically transportation is said to have a positive function for improving the economy of a region if it is able to shorten the distance traveled to economic centers, as well as connecting producers and consumers in an area in terms of facilitating people's mobility, expediting the traffic of goods and services and encourage economic activity. The length of Regency roads is adequate, with Regency roads reaching 896,926 kilometers in 2021 and total road length reaching 996,691 kilometers. (data presented in Table 4.1).

However, it was discovered that the length of provincial and state roads has not increased in recent years, with State roads measuring 48.57 kilometers and provincial roads measuring 44.2 kilometers. It is crucial to construct provincial and state roads in rural areas of Aceh Tamiang Regency, Aceh province, in order to enhance economic accessibility.The length of roads in Aceh Tamiang Regency will decrease to 1060.37 kilometers in 2019, 1034.659 kilometers in 2020, and 986.96 kilometers in 2021. The extent of roads that are severely damaged as of 2021 is 161,558 kilometers, 17.32 kilometers are damaged, 396,285 kilometers are moderate, and 414,533 kilometers are excellent. These factors are closely related to the rise in transportation costs, transportation operational expenses, and the cost of people's economic necessities. This is corroborated by BPS data indicating that commodity essentials and building/construction materials are likely to increase in Aceh Tamiang Regency in 2021.On the basis of the results of multiple linear regression, a R Square value of 0.805% is determined. This demonstrates that 80.50 percent of GRDP is affected by the increase in road length and vehicle volume. The remaining 0.40 percent is affected by other variables. In other words, the significance of the length of the road and the number of vehicles on GRDP is 80.50 percent, while the significance of the other variables is 19.50 percent.

The influence of road length and number of vehicles has a 6.80% impact on employment opportunities, while other variables influence the remaining 93.80%. The other variables mentioned are the factor of job availability, the factor of the quality of human resources in the workforce, and the suitability of job market requirements, as well as the skills of the workforce, which are crucial at the current level of

global competition.In addition, the agricultural, forestry, and fisheries sectors, as well as the mining and quarrying sector, as well as the manufacturing industry sector, all contribute to the expansion of employment opportunities. Several of these sectors are prevalent in the formation of the Aceh Tamiang Regency PDRB. Consequently, these industries employ the greatest number of people in the Aceh Tamiang Regency.

IV. CONCLUSION

Although the results and discussion of this study were only obtained from available data for the last 9 (nine) years in Aceh Tamiang Regency, it is hoped that the source of the data obtained can answer the objectives of this study. Based on the results and discussion of the research, it can be concluded. Road length has no significant effect on increasing regional income in Aceh Tamiang Regency; The number of vehicles has a positive/significant effect on increasing regional income in Aceh Tamiang Regency; Road length has no significant effect on employment opportunities in Aceh Tamiang Regency; and The number of vehicles has no significant effect on employment opportunities in Aceh Tamiang Regency.

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