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Comparative Study of Regional Development Before and After The Trans Sumatera Toll Road (Case Study Lampung Province)

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Abstract: The Central Statistics Agency (BPS) records that the economic growth in Lampung Province has experienced a lower growth rate compared to the national economic growth. This condition is exacerbated by the lack of development in existing infrastructure, especially provincial roads that have suffered severe damage. In this context, the provision of toll road infrastructure becomes crucial in regional development as it serves as a means to facilitate and support community activities. This study aims to analyze the differences in the Gross Regional Domestic Product (GRDP) of transportation and warehousing, tourism, agriculture, forestry and fisheries, Regional Original Income (PAD), and economic growth of districts in Lampung Province before and after the existence of the Trans-Sumatra Toll Road. The research method used is a quantitative approach using five variables, namely Transportation and Warehousing, Tourism, Agriculture, Forestry and Fisheries, Regional Original Income, and Economic Growth. Secondary data related to these variables were collected, especially those related to transportation and warehousing, tourism, agriculture, forestry and fisheries, regional original income, and economic growth. The study involved six Districts/Cities in Lampung Province traversed by the Trans-Sumatra Toll Road, namely South Lampung, Central Lampung, Mesuji, Pesawaran, Tulang Bawang, and West Tulang Bawang. Observation samples were collected for 4 years before and 4 years after the existence of the Trans-Sumatra Toll Road for the period 2015-2022. The collected data was then processed using SPSS Ver. 26 software. The results of the study indicate that the existence of the Trans-Sumatra toll road in several districts of Lampung Province has a significant impact on various economic sectors and Regional Original Income (PAD). The presence of significant average differences indicates that the Trans-Sumatra toll road has had a considerable impact on the economic sector and Regional Original Income in the mentioned districts.

Keywords: Economic Growth, Regional Original Income, Transportation and Warehousing, Tourism, Agriculture, Forestry and Fisheries.

INTRODUCTION

Endowed with a variety of natural potential and abundant commodities ranging from rubber, palm oil, coffee, petroleum, coal and natural gas, since 2015 the island of Sumatra has been recorded as contributing 22.21% of Indonesia's gross domestic product, the second largest after Java island, (BPS, 2023). Therefore, the progress and sustainability of the economy of Sumatra island is very important to ensure the stability and growth in that region. If the growth stops, the development of the surrounding areas will also be hampered. One of the provinces that Trans Sumatra passes through is Lampung Province.

Source: BPS Lampung Province in Figures, (2023)

Figure 1: Map of Lampung Province

Lampung province is a province located on the southeastern tip of the island of Sumatra. The total area of Lampung province is 35,376.50 km2. The Lampung Province is located between 105°45′-103°48′ East Longitude; and between 3°45'-6°45' South Latitude.The geographical position of Lampung province is in the west, bordering with Indian Ocean, to the east with Java Sea, to the north it borders the province South Sumatra And Bengkulu, and to the south it borders with Sunda Strait. Lampung Province has a main port called Panjang International Port and Bakauheni Ferry Port, main airport Radin Inten II International Airport located 28 km from the provincial capital, as well as a large railway station Tanjung Karang which is located in the center of the provincial capital. (BPS Lampung Province in Figures, 2023)

Macro economic development, especially in toll road infrastructure development policies, should have a positive impact on economic growth, because it will have a number of multiplier effects on all sectors and components in the economy (IMF, 2015; Srinivasu & Rao, 2013). Prapti, Edy & Dian (2015) and Usman (2020), in their research results, stated that economic growth can influence the construction of JTTS. Furthermore, Iek (2013), said that economic growth due to the construction of JTTS includes the emergence of new economic activities in the form of trade and transportation services businesses, small industrial businesses, provision of materials for buildings, use of technology; efficiency of

transportation costs, income levels and utilization of financial institutions; and patterns of economic transactions.

A region will experience accelerated economic growth if it has the potential of an economic sector which capable of accelerating construction and other sectors (Rustiadi et al, 2011; Wisnu & Wijaya, 2014). Toll road construction infrastructure in general (including electricity, education, transportation, health, water and so on) has a positive impact on economic growth which can reduce poverty levels (Tinambunan et al, 2019; Panjaitan et al, 2019; Maharani, 2015; Fatchurrohman, 2019). The construction of toll road infrastructure requires funding and investment which needs to be managed well and supported by strong institutions, so that the development of this infrastructure is right on target, effective and efficient (Mubin, 2019; Kaupa, 2015; Palei, 2015). With the construction of toll roads, there will be a spillover effect on regional economic growth (DPR Expertise Agency, 2016).

The construction of toll roads directly impacts economic, social and environmental aspects. In the economic aspect, toll road construction can improve the local economy in the form of government spending which leads to increase employment opportunities and local taxes (Chi & Waugama, 2010; Clower & Weinstein, 2016), reducing traffic burdens, and improving roads in areas that anticipate changes in settlement and population, (Andani & Geurs, 2019).

METHOD

This research is descriptive research with a quantitative and qualitative approach. This research was carried out by collecting quantitative data and presenting it in accurate information about the influence of Transportation and Warehousing, Tourism, Agriculture, Forestry and Fisheries on Regional Original Income and Economic Growth in the Regency of Lampung Province. After that, use a comparative test to determine the differences in Transportation and Warehousing, Tourism, Agriculture, Forestry and Fisheries, Regional Original Income and Economic Growth in Lampung Regency before and after the Trans Sumatra Toll Road.

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Qualitative data uses documentation and interviews with related parties in the districts of Lampung Province who pass through the Trans Sumatra Toll Road. The use of research instruments in the form of documentation is one of the methods used to obtain data and information in the form of books, archives, documents, writing, figures and images in the form of reports and information that can support research (Sugiyono, 2019). The documentation instruments used to collect data can be interpreted which are then reviewed and analyzed according to the research topic raised in the research.

The interview technique used in this research is a semi-structured interview. This type of interview is included in the in-depth interview category, where its implementation is freer than structured interviews. The aim of this type of interview is to find problems more openly, where the party being interviewed is asked for their opinions and ideas.

RESULTS AND DISCUSSION

In this study, researchers used t-test analysis for two paired samples using the SPSS Program (Statistical Product and Service Solution) Version 26.00. The t test for two paired samples is used to test comparisons of two paired samples or is interpreted as a sample with

the same subject but experiencing two different treatments or measurements. Regarding the data that will be processed in the SPSS Ver. 26.00 is data sourced from BPS Lampung Province.

To find out the significant average differences between Transportation and warehousing, Tourism, Agriculture, forestry and fisheries, Regional Original Income, Economic Growth before and after the Trans Sumatra toll road in districts in Lampung Province. Hypothesis testing will be carried out using the two-way average difference T statistic hypothesis test (tcount) as seen in the following results for South Lampung Regency.

South Lampung Regency

Table 1. Comparative Test Results Before and After Jalan Tol Trans Sumatra in South Lampung Regency

Variable	t-Value	P-Value	Hypothesis
Transportation and warehousing (X1)_before trans Sumatra toll road - Transportation and warehousing (X1)_after trans Sumatra toll road	-0.918	0.426	Rejected
Tourism (X2)_before Trans Sumatra toll road – Tourism (X2)_after trans Sumatra toll road	-5.111	0.014	Accepted
Agriculture, forestry and fisheries (X3)_before trans Sumatra toll road - Agriculture, forestry and fisheries (X3)_after trans Sumatra toll road	-7,011	0.006	Accepted
Original Regional Income (Z)_before trans Sumatra toll road – Original Regional Income (Z)_after trans Sumatra toll road	-5,009	0.015	Accepted
Economic Growth (Y)_before trans Sumatra toll road – Economic Growth (Y)_after trans Sumatra toll road	1,647	0.198	Rejected

Source: Processed SPSS Data Ver. 26 (2024)

The Following is the analysis for each variable:

1. Transportation and warehousing (X1): There is no significant difference after toll road construction, because the p-value (0.426) is greater than the significance level (0.05), so the hypothesis is rejected.
2. Tourism (X2): There is a significant difference after the construction of the toll road, because the p-value (0.014) is smaller than the significance level (0.05), so the hypothesis is accepted.
3. Agriculture, forestry and fisheries (X3): There is a significant difference after the construction of the toll road, because the p-value (0.006) is smaller than the significance level (0.05), so the hypothesis is accepted.
4. Regional Original Income (Z): There is a significant difference after the construction of the toll road, because the p-value (0.015) is smaller than the significance level (0.05), so the hypothesis is accepted.
5. Economic Growth (Y): There is no significant difference after the construction of the toll road, because the p-value (0.198) is greater than the significance level (0.05), so the hypothesis is rejected.

Central Lampung Regency

Table 2. Comparative Test Results Before and After Jalan Tol Trans Sumatra in Central Lampung Regency

Variable	t-Value	P-Value	Hypothesis
Transportation and warehousing (X1)_before trans Sumatra toll road - Transportation and warehousing (X1)_after trans Sumatra toll road	-4,486	0.021	Accepted
Tourism (X2)_before Trans Sumatra toll road –	-4,159	0.025	Accepted

Tourism (X2)_after trans Sumatra toll road			
Agriculture, forestry and fisheries (X3)_before trans Sumatra toll road - Agriculture, forestry and fisheries (X3)_after trans Sumatra toll road	-1,275	0.292	Rejected
Original Regional Income (Z)_before trans Sumatra toll road – Original Regional Income (Z)_after trans Sumatra toll road	-5,973	0.009	Accepted
Economic Growth (Y)_before trans Sumatra toll road – Economic Growth (Y)_after trans Sumatra toll road	1,504	0.230	Rejected

Source: Processed SPSS Data Ver. 26 (2024)

The following is the analysis for each variable:

1. Transportation and warehousing (X1): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.021) is smaller than the significance level (0.05), so the hypothesis is accepted.
2. Tourism (X2): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.025) is smaller than the significance level (0.05), so the hypothesis is accepted.
3. Agriculture, forestry and fisheries (X3): There is no significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.292) is greater than the significance level (0.05), so the hypothesis is rejected.
4. Regional Original Income (Z): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.009) is smaller than the significance level (0.05), so the hypothesis is accepted.
5. Economic Growth (Y): There is no significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.230) is greater than the significance level (0.05), so the hypothesis is rejected.

Mesuji Regency

Table 3. Comparative Test Results Before and After Jalan Tol Trans Sumatra in Mesuji Regency

Variable	t-Value	P-Value	Hypothesis
Transportation and warehousing (X1)_before trans Sumatra toll road - Transportation and warehousing (X1)_after trans Sumatra toll road	-5,391	0.013	Accepted
Tourism (X2)_before Trans Sumatra toll road – Tourism (X2)_after trans Sumatra toll road	-4,693	0.018	Accepted
Agriculture, forestry and fisheries (X3)_before trans Sumatra toll road - Agriculture, forestry and fisheries (X3)_after trans Sumatra toll road	-3,673	0.035	Accepted
Original Regional Income (Z)_before trans Sumatra toll road – Original Regional Income (Z)_after trans Sumatra toll road	-19,014	0,000	Accepted
Economic Growth (Y)_before trans Sumatra toll road – Economic Growth (Y)_after trans Sumatra toll road	1,564	0.216	Rejected

Source: Processed SPSS Data Ver. 26 (2024)

The following is the analysis for each variable:

1. Transportation and warehousing (X1): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.013) is smaller than the significance level (0.05), so the hypothesis is accepted.
2. Tourism (X2): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.018) is smaller than the significance level (0.05), so the hypothesis is accepted.

3. Agriculture, forestry and fisheries (X3): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.035) is smaller than the significance level (0.05), so the hypothesis is accepted.
4. Regional Original Income (Z): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.000) is very smaller than the significance level (0.05), so the hypothesis is accepted.
5. Economic Growth (Y): There is no significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.216) is greater than the significance level (0.05), so the hypothesis is rejected.

Pesawaran Regency

Table 4. Comparative Test Results Before and After Jalan Tol Trans Sumatra in Pesawaran Regency

Variable	t-Value	P-Value	Hypothesis
Transportation and warehousing (X1)_before trans Sumatra toll road - Transportation and warehousing (X1)_after trans Sumatra toll road	-2,767	0.070	Rejected
Tourism (X2)_before Trans Sumatra toll road – Tourism (X2)_after trans Sumatra toll road	-8,386	0.004	Accepted
Agriculture, forestry and fisheries (X3)_before trans Sumatra toll road - Agriculture, forestry and fisheries (X3)_after trans Sumatra toll road	-2,213	0.114	Rejected
Original Regional Income (Z)_before trans Sumatra toll road – Original Regional Income (Z)_after trans Sumatra toll road	-3,309	0.045	Accepted
Economic Growth (Y)_before trans Sumatra toll road – Economic Growth (Y)_after trans Sumatra toll road	1,675	0.193	Rejected

Source: Processed SPSS Data Ver. 26 (2024)

The following is the analysis for each variable:

1. Transportation and warehousing (X1): There is no significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.070) is greater than the significance level (0.05), so the hypothesis is rejected.
2. Tourism (X2): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.004) is smaller than the significance level (0.05), so the hypothesis is accepted.
3. Agriculture, forestry and fisheries (X3): There is no significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.114) is greater than the significance level (0.05), so the hypothesis is rejected.
4. Regional Original Income (Z): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.045) is smaller than the significance level (0.05), so the hypothesis is accepted.
5. Economic Growth (Y): There is no significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.193) is greater than the significance level (0.05), so the hypothesis is rejected.

Tulang Bawang Regency

Table 5. Comparative Test Results Before and After Jalan Tol Trans Sumatra in Tulang Bawang Regency

Variable	t-Value	P-Value	Hypothesis
Transportation and warehousing (X1)_before trans Sumatra toll road - Transportation and warehousing (X1)_after trans Sumatra toll road	-5,630	0.011	Accepted

Tourism (X2)_before Trans Sumatra toll road – Tourism (X2)_after trans Sumatra toll road	-5,160	0.014	Accepted
Agriculture, forestry and fisheries (X3)_before trans Sumatra toll road - Agriculture, forestry and fisheries (X3)_after trans Sumatra toll road	-4,348	0.022	Accepted
Original Regional Income (Z)_before trans Sumatra toll road – Original Regional Income (Z)_after trans Sumatra toll road	-14,583	0.001	Accepted
Economic Growth (Y)_before trans Sumatra toll road – Economic Growth (Y)_after trans Sumatra toll road	2,888	0.063	Rejected

Source: Processed SPSS Data Ver. 26 (2024)

The following is the analysis for each variable:

1. Transportation and warehousing (X1): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.011) is smaller than the significance level (0.05), so the hypothesis is accepted.
2. Tourism (X2): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.014) is smaller than the significance level (0.05), so the hypothesis is accepted.
3. Agriculture, forestry and fisheries (X3): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.022) is smaller than the significance level (0.05), so the hypothesis is accepted.
4. Regional Original Income (Z): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.001) is very much smaller than the significance level (0.05), so the hypothesis is accepted.
5. Economic Growth (Y): There is no significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.063) is greater than the significance level (0.05), so the hypothesis is rejected.

West Tulang Bawang Regency

Table 6. Comparative Test Results Before and After Jalan Tol Trans Sumatra in West Tulang Bawang Regency

Variable	t-Value	P-Value	Hypothesis
Transportation and warehousing (X1)_before trans Sumatra toll road - Transportation and warehousing (X1)_after trans Sumatra toll road	-6,263	0.008	Accepted
Tourism (X2)_before Trans Sumatra toll road – Tourism (X2)_after trans Sumatra toll road	-4,826	0.017	Accepted
Agriculture, forestry and fisheries (X3)_before trans Sumatra toll road - Agriculture, forestry and fisheries (X3)_after trans Sumatra toll road	-9,627	0.002	Accepted
Original Regional Income (Z)_before trans Sumatra toll road – Original Regional Income (Z)_after trans Sumatra toll road	-7,422	0.005	Accepted
Economic Growth (Y)_before trans Sumatra toll road – Economic Growth (Y)_after trans Sumatra toll road	1,662	0.195	Rejected

Source: Processed SPSS Data Ver. 26 (2024)

The following is the analysis for each variable:

1. Transportation and warehousing (X1): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.008) is smaller than the significance level (0.05), so the hypothesis is accepted.

2. Tourism (X2): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.017) is smaller than the significance level (0.05), so the hypothesis is accepted.
3. Agriculture, forestry and fisheries (X3): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.002) is smaller than the significance level (0.05), so the hypothesis is accepted.
4. Regional Original Income (Z): There is a significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.005) is smaller than the significance level (0.05), so the hypothesis is accepted.
5. Economic Growth (Y): There is no significant difference between the conditions before and after the construction of the Trans Sumatra toll road, because the p-value (0.195) is greater than the significance level (0.05), so the hypothesis is rejected.

The results of the analysis show that the construction of the Trans Sumatra toll road has a significant impact on transportation and warehousing, tourism, agriculture, forestry, fisheries and local revenue, but there is no significant impact on economic growth.

Discussion Comparative Analysis Results

From the difference test between two averages or comparisons, it shows that:

Table 8. Summary of Comparison Results in 6 Districts

Regency	Variable	Results
South Lampung	Tourism, Agriculture, Forestry, Fisheries, Regional Original Income	There are significant differences before & after the Trans Sumatra Toll Road
central Lampung	Transportation and Warehousing, Tourism, Regional Original Income	There are significant differences before & after the Trans Sumatra Toll Road
Mesuji	Transportation and Warehousing, Tourism, Agriculture, Forestry, Fisheries, Regional Original Income	There are significant differences before & after the Trans Sumatra Toll Road
Pasawaran	Transportation and Warehousing, Tourism, Regional Original Income	There are significant differences before & after the Trans Sumatra Toll Road
Onion Bones	Transportation and Warehousing, Tourism, Agriculture, Forestry, Fisheries, Regional Original Income	There are significant differences before & after the Trans Sumatra Toll Road
West Garlic Bones	Transportation and Warehousing, Tourism, Agriculture, Forestry, Fisheries, Regional Original Income, Economic Growth	There are significant differences before & after the Trans Sumatra Toll Road

Source: Data Processing Results (2024)

The summary results show:

1. There are significant average differences between the Tourism, Agriculture, Forestry and Fisheries sectors, as well as Regional Original Income before and after the Trans Sumatra toll road in South Lampung Regency, Lampung Province.
2. In Central Lampung Regency, Lampung Province, there are significant average differences between the Transportation and Warehousing, Tourism and Regional Original Income sectors before and after the Trans Sumatra toll road.
3. Mesuji Regency, Lampung Province, shows that there are significant average differences between the Transportation and Warehousing, Tourism, Agriculture, Forestry and Fisheries sectors, as well as Regional Original Income before and after the Trans Sumatra toll road.

4. There are significant average differences between the Transportation and Warehousing, Tourism and Regional Original Income sectors before and after the Trans Sumatra toll road in Pasawaran Regency, Lampung Province.
5. In Tulang Bawang Regency, Lampung Province, there are significant average differences between the Transportation and Warehousing, Tourism, Agriculture, Forestry and Fisheries sectors, as well as Regional Original Income before and after the Trans Sumatra toll road.
6. West Tulang Bawang Regency, Lampung Province, also shows significant average differences between the Transportation and Warehousing, Tourism, Agriculture, Forestry, Fisheries, Regional Original Income and Economic Growth sectors before and after the Trans Sumatra toll road.

Discussion Respondent Interview Results

From the results of the interviews conducted, the following is a discussion of the research results in the following table:

Table 9. Summary of Interview Results

Interview Aspects	Conclusion
Logistics	The increase in toll rates has caused many eateries and restaurants to close, logistics mobility has fluctuated, the dilemma of entering toll roads with expensive rates vs. highways with unofficial fees, and the price of goods has fallen because logistics costs can be reduced.
Tour	Plans for the construction of industrial areas and SEZs, a drastic increase in tourism, the arrival of tourists from various regions, and new investments in the tourism sector.
Agriculture	Plans for the entry of foreign investors, stagnation of new investors, development of agro-industry, and the existence of the largest sugar factory in Indonesia.
General	The impact of economic growth has not been felt by the regional government and the community, there has been no significant increase in Original Regional Income, weak planning regarding toll roads, diverse point of view in the benefits of toll roads, the impact of toll roads has only been felt after 20 years, and there is a lack of night lighting on toll roads.

Source: Data Processing Results (2024)

Based on the results of the interviews presented, it shows that toll road construction has a diverse impact on various sectors, with challenges and potential that need to be considered in an effort to maximize its benefits for economic and social development in the relevant areas.

1. Logistics: The increase in toll rates causes an increase in operational costs for business actors in the logistics sector, which in turn can result in the closure of restaurants and eateries.
2. Tourism: Plans for the construction of industrial areas and Special Economic Zones (SEZ) show the government's efforts to increase investment and tourism development in the area.
3. Agriculture: The planned entry of foreign investors in the agricultural sector reflects the potential for development of the agricultural sector and the existence of investment interest in the area.
4. General: The impact of economic growth has not been experienced by local governments and the community, indicating that economic changes resulting from infrastructure construction such as toll roads will take longer to materialize.

CONCLUSION

To encourage the economic development of Lampung Province, especially with the support of output from the Trans-Sumatra toll road, several policies and efforts are needed, including:

1. Apart from toll roads, there is a need to develop supporting infrastructure such as ports, airports and adequate local transportation networks.
2. Lampung Province can develop a modern and efficient logistics center to handle the distribution of goods from ports and the Trans-Sumatra toll road.
3. Even though tourism has a positive impact on PAD, there is still a lot of potential that can be maximized.
4. Lampung Province can make efforts to diversify its economic base by developing non-agricultural, non-fishing and non-forestry sectors, such as creative industries, agribusiness, technology and related services.
5. Investments in vocational education and training can improve the skills and productivity of the local workforce. This will support the growth of economic sectors that require skilled workforce.
6. The establishment of a special economic zone around the Trans-Sumatra toll road could be an attraction for investors and industry.
7. The Lampung Provincial Government needs to develop policies that support investment, reduce bureaucracy and create a conducive business environment.

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