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ISSN (Online): 2455-7838

SJIF Impact Factor : 6.260

ISI I.F. Value : 1.241

EPRA International Journal of

Research & Development

(IJRD)

Monthly Peer Reviewed & Indexed
International Online Journal

Volume: 4, Issue:8, August 2019

Indexed By:



Published By
EPRA Publishing

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EFFECT OF THE SEI BANGOUAN BRIDGE ACCESSIBILITY TO COMMUNITY ECONOMY: (CASE STUDY OF TEBING TINGGI CITY) NORTH SUMATRA, INDONESIA

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ABSTRACT

The study aims to analyze differences in the level of community accessibility before and after the construction of the Sei Bangouan bridge. The study was performed in the Padang Merbau sub-district, Padang Hulu district, Tebing Tinggi City with a sample of 100 people from all families in the Padang Merbau sub-district. Data analysis was taken using the Wilcoxon Match Pair Test method. Results showed that the intensity of the journey performed by participants in 1 week showed a rise of 5-6 times in 1 week to 7-8 times in 1 week. The average travel time indicates a decline from 41-50 minutes to 21-30 minutes. The average transportation cost in one month showed a decrease from IDR 201,000-300,000 to IDR 101,000-200,000. The average facility of transportation shows an improvement from hard to easy.

KEYWORDS: *Accessibility; bridge; transportation; regional development*

INTRODUCTION

As a basic infrastructure, infrastructure systems and transport facilities are basic requirements for regional economic activities (Tamin, 2000). The support system for transport infrastructure plays an important role in regional economic activities' efficiency and effectiveness. Transportation services and infrastructure affect the accessibility level of an area.

Bridges are structures designed to overcome natural or artificial barriers and as a connection for

the highway. Roads Law No. 38 of 2004 says the significance of roads including bridge as significant transportation infrastructure in the country and state life.

Sei Bangouan Bridge is the only direct access to Pasar Tengah Sub-District between Neighborhood I and V, Padang Merbau Sub-District, Padang Hulu Sub-District. The bridge acts as a way for students and the community to cross.



Figure 1. Physical conditions before the construction of the



Figure 2. Present bridge condition

The picture above illustrates the pre-and post-bridge conditions. Padang Merbau Village and Pasar Tengah Village condition is surrounded by plantations of oil palm trees and agricultural area.

The bridge's building lessens the travel time that was longer because it had to pass through Padang Hulu District's main highway, which also causes higher transport expenses.



Figure 3. Condition after the construction of the bridge

The existing condition of the bridge built was a concrete bridge from the Tebing Tinggi City Regional Budget with dimensions of 30 m x 10 m.

Results from Purba's studies, et al (2015) discovered that constructing the Lau Jahe Bridge had a beneficial effect on raising community income in Pergendangen Village, Tigabinanga sub-district, Karo Regency. Pribadi, et al (2014) performed a study entitled Analysis of Bridge Traffic Performance Based on 1997 MKJI and Community Perception (Banda Aceh Keutapang Bridge Case Study). The bridge as a transportation infrastructure plays a very influential role in ensuring smooth traffic flows.

OBJECTIVES OF THE STUDY

Analyze the difference levels of community accessibility before and after the construction of the Sei Bangouan bridge.

RESEARCH METHODOLOGY

The study was undertaken in the sub-district of Padang Hulu, Padang Merbau Village, Tebing Tinggi City. All households (RT) in the Padang Merbau Village were the population in this study, which added up to 400 households (KK) and Pasar Tengah Village, which added up to 600 households so that there were 1000 households. In addition, a sample of 100 individuals was generated using the Slovin method.

Data collected through interviews and observations or questionnaires. Secondary data were

collected from multiple organizations such as the Regional Planning Agency (Bappeda), the Transportation Agency, the Public Works Agency, the Central Statistics Agency (BPS) and other associated organizations. Using the Wilcoxon Match Pair Test method, data analysis was worked.

LITERATURE REVIEW

Development theory

Development agreements for providing changes are generally granted (Riyadi and Bratakusumah, 2005). Siagian (1994) provides an understanding of development as "A business or a series of efforts for growth and change planned and carried out in the context of national development by a nation, state and government towards progressivism." Kartasmita (1994) offers a better interpretation; through intended actions, development is a process of change for the better. "Alexander in Fawzia (2014) describes development as a change process that includes all social systems, including politics, economy, infrastructure, security, education and technology, security and culture.

Transportation Infrastructure

Transportation is the transportation or movement of cargo (products and individuals) from one location to another (Adisasmita, 2011). Transportation is aimed at providing access to socialize, getting the services

and products we need in a manner that is simple, low cost, and has little effect (Hairulsyah, 2006).

Transportation is said to be ideal when the frequency of service is optimal, secure, free from the potential of accidents and satisfying service conditions and the trip is fast enough or does not frequently encounter road congestion. Sinulingga (1999) says that the advancement of optimal circumstances is largely determined by difference factors of this transport, namely the condition of infrastructure (roads), the road network system, the condition of transport (cars) and the mental behavior of the users of the transport services.

Jembatan

A bridge is a building that enables rivers/waterways, valleys or other highways that are not of the same level to be crossed. The function of transport needs, technical and architectural-esthetic requirements including traffic aspects, technical aspects, aesthetic aspects should be considered in the planning and design of a bridge (Supriyadi and Muntohar, 2007). A steel frame bridge is a bridge structure constructed of a sequence of steel plates attached, according to Asiyanto (2008).

Bina Marga (1991) constructed several types of constructions on concrete strengthened bridges.:

1. concrete plate type.
2. T beam type bridge
3. composite beam type.

Regional Development

Development can be viewed as adding, improving, enhancing or expanding activities (Sirojuzilam and Mahalli, 2010). Mulyanto (2008)

identifies regional development as any government action to achieve a goal that benefits the region itself and the administrative unity of the Republic of Indonesia. Regional development and natural resource management in line with the region's ability through; 1) Potential mapping and regional development planning; 2) regional infrastructure development in line with capacity-building.

The development of transport infrastructure is one of the key points in improving the economic growth of a country (Susantono and Berawi, 2012). The transport sector has a strategic function and role in promoting infrastructure and developers in the context of regional development (Adisasmita, 2005). Regional development transportation is the primary support that enables a region to develop (Miraza, 2010). Transport's function as a connector, mileage reduction, and bridging between two locations that need each other (Adisasmita, 2011). Transport infrastructure accessibility has a very powerful connection with regional development level, which has the characteristics of economic growth rate and social welfare (Ernawi, 2007).

RESULT

The difference Levels of Community Accessibility Before and After the Construction of the Sei Bangouan Bridge

The difference in the community's level of accessibility before and after the Sei Bangouan Bridge construction shows a significant difference based on the Wilcoxon Match Pair Test as shown in Table 1.

Table 1
Test results for Wilcoxon Matc Pair

Community Accessibility	Z	Asymp. Sig. (2-tailed)
Intensity of travel	8,828	0,000
Traveling time	8,949	0,000
Costs of transport	8,598	0,000
Facility of transport	9,447	0,000

Source: Processed primary data, 2018.

Hypothesis:

H₀ : There was no significant impact on the difference in accessibility before and after the construction of the Sei Bangouan Bridge

H_a : There was a significant impact on the difference in accessibility before and after the construction of the Sei Bangouan Bridge

The decision criteria for the Z test are as follows:

If probability < 0,05, H_a accepted, H₀ rejected

If probability > 0,05, H_a rejected, H₀ accepted

Intensity of travel

Based on data analysis using the Wilcoxon Match Pair Test formula, the z values collected for

pre-and-post differences in community accessibility before and after the construction of the Sei Bangouan Bridge on the travel intensity aspect were 8,828 with a p-value of 0,000 meaning p-value < 0,05 (α) then H_a accepted and H₀ rejected. There are differences in the community's accessibility before and after the construction of the Sei Bangouan Bridge, so it can be concluded that the aspect of significant travel intensity between before and after the construction of the Sei Bangouan Bridge is increasing in community accessibility.

Traveling time

Based on data analysis using the Wilcoxon Match Pair Test formula, the z values collected for pre-and-post differences in community accessibility before and after the construction of the Sei Bangouan

Bridge on the travel intensity aspect were 9,949 with a p-value of 0,000 meaning $p\text{-value} < 0,05$ (α) then H_a accepted and H_o rejected. There are differences in the community's accessibility before and after the construction of the Sei Bangouan Bridge, so it can be concluded that the aspect of significant travel intensity between before and after the construction of the Sei Bangouan Bridge is increasing in traveling time.

Costs of transport

Based on data analysis using the Wilcoxon Match Pair Test formula, the z values collected for pre-and-post differences in community accessibility before and after the construction of the Sei Bangouan Bridge on the travel intensity aspect were 8,598 with a p-value of 0,000 meaning $p\text{-value} < 0,05$ (α) then H_a accepted and H_o rejected. There are differences in the community's accessibility before and after the construction of the Sei Bangouan Bridge, so it can be concluded that the aspect of significant travel intensity between before and after the construction of the Sei Bangouan Bridge is increasing in costs of transport.

Facility of transport

Based on data analysis using the Wilcoxon Match Pair Test formula, the z values collected for pre-and-post differences in community accessibility before and after the construction of the Sei Bangouan Bridge on the travel intensity aspect were 9,448 with a p-value of 0,000 meaning $p\text{-value} < 0,05$ (α) then H_a accepted and H_o rejected. There are differences in the community's accessibility before and after the construction of the Sei Bangouan Bridge, so it can be concluded that the aspect of significant travel intensity between before and after the construction of the Sei Bangouan Bridge is increasing in facility of transport..

DISCUSSION

Based on the results of the analysis of the Wilcoxon Match Pair test proves that after construction the Sei Bangouan Bridge, community accessibility brings better results. There was an increase in the average intensity of rides taken by respondents within 1 week. The average intensity of the ride is 5-6 times in 1 week before the construction of the bridge. After the bridge was built, it showed a 7-8 increase in 1 week.

The respondents' average travel time showed a reduction, where the respondents' average travel time was 41-50 minutes before the bridge was constructed. After constructing the bridge showed a 21-30 minute reduction. The average cost of travel by respondents in 1 month indicates a reduction where the average cost of transportation spent by respondents was IDR 201,000-300,000. After the bridge was built, the cost of transportation was reduced, particularly from IDR 101,000 to 200,000. The average transportation facility shows a difficult to easy.

These findings are in line with the Purba, et al (2015) study that the construction of the Lau Jahe

Bridge has a positive impact on reducing travel time and cost of transportation. Based on bridge classification, Sei Bangouan Bridge is included in the category of fixed bridges made of composite concrete. Bridge classification by function includes bridges on the highway. Composite bridges are classified according to the material used. The vehicle floor-based bridge categories include the upper floor bridge. Bridge classifications based on the upper structure design including the bridge beam/girder.

CONCLUSION AND SUGGESTIONS

Conclusion

The level of community accessibility after the construction of the Sei Bangouan Bridge showed better improvement and there were significant differences compared to before the Sei Bangouan Bridge was constructed.

Suggestions

Based on the findings, some initiatives need to be made in Tebing Tinggi City to strengthen the economy and regional development of the community:

1. The Central Government and Tebing Tinggi City must continue to prioritize the construction of transport infrastructure to make it simpler, more effective and smoother for the community to manage activities
2. The government of Tebing Tinggi city continues to enhance the bridge construction quality so that the endurance of the highway and bridge can be longer.

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