

Analysis of Transportation Infrastructure Development to Support Economic Growth in Batu Bara Regency

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Abstract

This study aims to examine the Analysis of Transportation Infrastructure Development to Support Economic Growth in the Batu Bara Regency Area. The type of research used in this study is qualitative research. Data collection techniques are the means used to obtain the data and information needed to achieve research objectives. In this case, the researcher carried out several data analysis techniques, namely as follows: Data Reduction, Data Presentation and Verification. The results of the research The development of transportation infrastructure in Batu Bara Regency is the key to encouraging regional economic growth. The conclusions of this development can include several main points: Improved Connectivity: Good transportation infrastructure will improve connectivity between regions, facilitate the flow of goods and services, and increase accessibility for the community. Good roads, railways, and efficient port facilities will accelerate the distribution of products, especially from strategic sectors such as agriculture, fisheries, and the processing industry. Investment Attractiveness: Adequate infrastructure will be an attraction for investors. Investors tend to be more interested in areas that have good transportation infrastructure because it facilitates logistics and business operations. This can increase labor absorption and open up new jobs.

Keywords: Transportation Infrastructure Development, Economic Growth and Batu Bara Regency

Introduction

The development of transportation infrastructure is one of the important factors that can support economic growth in a region, including in Batu Bara Regency, North Sumatra. This district has great potential in the industrial, agricultural, and fishery sectors, so strengthening the transportation network is very important to improve connectivity, accessibility, and smooth the flow of goods and services. Batu Bara Regency has several transportation infrastructures that play an important role in the economy, including highways, railways, and ports. However, there are still challenges in managing and improving the quality of this transportation infrastructure, such as uneven road conditions, limited accessibility, and lack of integration

between land, sea, and rail transportation modes. A number of infrastructure developments in Batu Bara Regency, North Sumatra continue to make progress to accelerate the development process. Especially in the Kuala Tanjung area which is one of the large industrial and economic sectors in Batu Bara Regency. One of the infrastructure developments that has been completed and is already in operation is the construction of the railway project.

The train is called the Datuk Belambang Railway, which has been operating since December 1, 2022 and is integrated with the Tebing Tinggi - Medan train. The train serves two trips every day. "The train per day from Tebing Tinggi-Bandar Tinggi-Tanjung Gading-Lalang serves two trips with a ticket price of Rp.5,000 per person for one train trip. In addition to passenger trains, this railway line has also been operating to transport shipping logistics goods such as containers transported from PT Pelabuhan Indonesia I (Pelindo I Persero), PT Multi Terminal Purpose, as well as palm oil raw materials and chemicals from the Sei Mangkei Special Economic Zone (SEZ), Simalungun to be distributed through shipping. In addition to the process of working on the railway project that has been completed, there is also the development of the Tebing Tinggi-Indrapura-Kuala Tanjung-Kisaran toll road project. This toll road is also integrated into the Sei Mangkei Special Economic Zone (SEZ) which aims to accelerate the distribution process of goods and services from Kuala Tanjung to Sei Mangkei, so that the pace of the economy is getting bigger and faster distribution of logistics goods and industrial products from various industrial companies in Kuala Tanjung including, PT Indonesia Asahan Aluminium (Persero), PT Multimas Nabati Asahan, PT Domba Mas Kuala Tanjung, PT Oleo Chemical Bakrie Group, PT Pelindo I, PT Multi Terminan Purpose.

In accordance with the embodiment of the value of Pancasila in the economic sector as affirmed in the 1945 Constitution of the Republic of Indonesia Article 33 concerning the Operational Basis of the Economic System based on the values of Pancasila, one of its applications is that with the development of this infrastructure, the impact felt by the community is very helpful in terms of improving the community's economy, because the surrounding local communities are involved in the infrastructure development process. In addition, people are also easier to transport and more economical, and faster to reach their destination. The infrastructure development in Batu Bara Regency also has an impact on improving the economy of better regional products, being able to increase the country's foreign exchange and creating jobs for the community, in addition to accelerating the distribution of logistics goods and industrial products. This rapid growth brings enormous potential, such as job growth, investment opportunities and significant social progress. However, behind this positive potential there are important challenges that need to be overcome. One of the biggest challenges

is meeting the needs of infrastructure that can support the development of this city. Infrastructure that includes transportation networks, energy supply, access to clean water, sanitation and information technology are key factors that support economic development and community welfare.

In this regard, rapid growth has increased the demand for better infrastructure, including wider highways, more efficient transportation systems, and reliable energy resources [1]. Success in meeting these needs is a key factor in maintaining sustainable economic growth and improving the quality of life of the population. Therefore, a deep understanding of the role of infrastructure in the economic growth of the city of Palembang is very necessary. This helps the government, stakeholders and communities to plan, develop and maintain the necessary infrastructure to support sustainable urban growth and provide benefits to all residents [2]. In this context, this study has an important objective to provide relevant insights and measurable solutions related to the role of infrastructure in economic development in Batu Bara Regency. Infrastructure is the foundation that supports the economic growth of a city, with components such as transportation networks, energy supply, water supply, sanitation systems, and information technology that make the city function properly [3]. Adequate and efficient infrastructure is not only a means to achieve economic goals, but also a catalyst for far-reaching impact. In the context of Batu Bara Regency, adequate infrastructure plays a role as the main driver of economic growth [4]. Quality infrastructure helps increase the productivity of key economic sectors, such as trade, the manufacturing industry, and the service sector. A good transportation network allows for the smooth movement of goods and people, reduces logistics costs and increases the competitiveness of local companies.

Infrastructure plays an important role as one of the driving forces of economic growth and development. The existence of adequate infrastructure is very necessary. Physical facilities and infrastructure are a very important part of service to the community. Various physical facilities are vital to support various governmental, economic, industrial and social activities in the community and government. Starting from energy systems, highway transportation, office buildings and schools, to telecommunications, houses of worship and clean water service networks, all of them require reliable infrastructure support.

Table 1. Road Length According to the Condition of Batu Bara Regency

Condition	Year	
	2023	2024
Good	118.037	117.231
Keep	273.800	283.056
Broken	207.200	203.800

Heavy Damage	8.000	5.600
Sum	607.037	609.687

Source: Coal Regency in Numbers, 2023

Roads are an important transportation infrastructure to facilitate and encourage economic activities. The increasing development efforts also demand an increase in road construction to facilitate population mobility and facilitate the flow of goods from one region to another. Judging from the condition, the majority of roads in Batubara Regency in 2024 are in moderate condition with a road length of 283,056 km or around 46.43 percent of the total total roads in Batubara Regency. Meanwhile, roads with good condition are only 19.2 percent or 117,231 km long.

In the short term, the development of road infrastructure will create jobs in the construction sector and in the medium and long term will support the improvement of efficiency and productivity of related economic sectors, so that the development of road infrastructure can be considered as a strategy to encourage the quality of education, economic growth, poverty alleviation, improvement of quality of life, increase in the mobility of goods. So that good road infrastructure is expected to increase the community's regional income, namely Gross Regional Domestic Income (GDP) such as the agriculture, forestry and fisheries, mining and quarrying sectors, processing industry, large and retail trade, construction and other supporting sectors of GDP. Based on the Batu Bara Regency Regional Spatial Plan (RTRW) 2013 - 2033 concerning the Infrastructure Network System Plan, namely the Transportation Network System Plan, it is stated that the Transportation Network System Plan is directed to encourage the development of physical, social and economic development, realize equitable development and encourage the development of coastal areas of Batu Bara Regency that are still isolated, the development of centers for agricultural, plantation and fishery products and realizing environmental conservation efforts through the application of principles of environmentally friendly and sustainable regional development. However, in addition to the need for the construction and improvement of the district road network throughout the Batu Bara coastal area, there are also many roads in villages and sub-districts (district roads) that still require serious attention to improve the surface condition and also the length of the road due to the condition of damaged roads such as production center roads such as agriculture, forestry, plantations and fisheries, especially in rural areas even though this area is a supporting production center increase in regional income (GDP) in Batu Bara Regency.

Literature Review

Transportation Infrastructure Development

According to Listyaningsih [5], development is defined as a series of efforts to realize growth and change in a planned and conscious manner taken by a country towards a better direction. Listyaningsih [5] argues that development is an increase in enjoyment. Development can be seen as both economic and political development. According to Sondang P. Siagian [6], infrastructure development is a business or a series of growth and change efforts that are carried out in a planned manner to build infrastructure or everything that is the main support for the implementation of a development process. According to Riyadi and Deddy Supriady [7], Development planning can be interpreted as a process of formulating alternatives or decisions based on data and facts that will be used as materials to carry out a series of activities or community activities, both physical (material) and non-physical (mental and spiritual), in order to achieve better goals

Economic Growth

Economic growth is an effort to increase production capacity to achieve additional output, which is measured using Gross Domestic Product (GDP) or using Gross Regional Domestic Product (GDP) in a region [8]. Simon Kuznets in Arsyad [8] states that economic growth is an increase in the long-term capacity of the country concerned to provide various economic goods to its residents. The increase in capacity is made possible by advances or adjustments – technological, institutional and ideological adjustments to various existing circumstances. Furthermore, Tora et al. [9] also stated that economic growth, namely the region, is able to improve its ability to produce goods and/or services from time to time. This is because the superior sector owned in a region is able to support the creation of economic growth in a region. This superior sector is because it can be used by other regions, so it indicates that the production of goods and/or services in an area is adequate. In addition, Suherman & Firdaus [10] also stated that economic growth is the addition of economic value in an area from period to period.

Method Approach

The type of research used in this study is qualitative research. Qualitative research is research in which in its presentation it does not use numbers but in the form of sentences, words, schemes, images and so on in accordance with the facts in the field [11]. In addition, it is also mentioned that qualitative research is usually in the form of descriptive and generally uses analysis with an inductive approach, carried out with a reasonable situation and the data collected is qualitative [12].

Data collection techniques are methods used to obtain the data and information needed to achieve research objectives [13]. The data collection techniques carried out in this study are as follows: Namely by making direct observations at the research site to find out the objectivity of the reality in the field. Interviews are intended to obtain information that cannot be obtained through observation. This is because researchers cannot observe the whole thing. Not all data can be obtained by observation, therefore researchers should ask questions to informants.

Data analysis is a process or effort to process data obtained from the results of interviews, field notes and documentation, into new information so that the characteristics of

the data become easier to understand and useful for solving a problem, especially related to research. And make conclusions so that they are easily understood by yourself and others [14].

In this case, the researcher conducted several data analysis techniques, which are as follows:

1. Data Reduction

Data reduction can be interpreted as the process of summarizing, focusing on simplification, abstraction, selecting the main things and discarding unnecessary data that arises from written records in the field.

2. Data Presentation

The presentation of this data can be done in the form of tables, graphs, and the like. And in this writing, the researcher focuses more on presenting data using narrative text.

3. Verification

The initial conclusions presented at this stage are still provisional, and will change if no strong evidence is found to support them at the next stage of data collection.

Discussion

Development of Transportation Infrastructure to Support Economic Growth in the Batu Bara Regency Area

The development of transportation infrastructure can support the economic growth of a region by: Increasing connectivity between regions, stimulating economic activities, making it easier for people to carry out economic activities, improving people's welfare, Reducing transaction costs. Some examples of transportation infrastructure improvements that can be done are:

1. Improve road connectivity, such as by repairing roads and adding road completeness
2. Improving rail connectivity, such as by developing high-speed trains and maintaining railway infrastructure
3. Improve maritime connectivity, such as by standardizing the performance of major ports
4. Improve air connectivity, such as by increasing airport carrying capacity

In addition to transportation infrastructure, other infrastructure developments that can also increase economic growth are:

1. Social infrastructure, such as human resource enrichment in terms of education and health
2. Financial infrastructure, such as cooperation with banks, state financial taxes, and posts.

Infrastructure plays an important role in supporting economic growth. The existence of infrastructure completeness determines the carrying capacity of an area in supporting various activities to generate added value. Infrastructure also plays an important role as one of the

driving forces of economic growth. This is because the pace and economic growth of a region cannot be separated from the availability of road infrastructure, clean water, and electricity. Infrastructure development in Batu Bara Regency is able to encourage the progress of Batu Bara Regency in a better direction. In fact, infrastructure development is a priority for a region. With good infrastructure development, it is able to increase the productivity and competitiveness of Batu Bara Regency. Good and equitable infrastructure development is able to save the cost of setting up a factory. Usually, industrial locations have been provided by the government, which allows companies to get a place to operate at a cheaper price and factory construction can run more efficiently. Even good infrastructure is also able to improve the efficiency of the company's operations. Good infrastructure is also able to facilitate the distribution and mobility of goods. Whether it is operations during the transportation of raw materials or final goods. Shorter and more efficient time makes the product price competitive not too expensive. It can be imagined that bad infrastructure will certainly make operations not smooth. This makes product prices expensive and uncompetitive. The increase in transportation infrastructure in an area also makes the improvement of facilities and infrastructure more even. When equity goes well, there is no longer such a thing as a disadvantaged area, poverty in an area becomes more resolved. In addition to transportation, infrastructure in communication also needs to be improved. By increasing development in the field of transportation and communication, the gap will not occur.

Contribution of Transportation Infrastructure to Support Economic Growth in the Batu Bara Regency Area:

1. Adequate Infrastructure Productivity and Efficiency Improvements significantly increase economic productivity and efficiency. Good highways, efficient ports, and integrated transportation networks reduce logistics costs and travel times, thereby improving the competitiveness of products in domestic and international markets. In addition, the stable and affordable availability of electricity allows the industry to operate optimally without interruption, which contributes to increased economic output [15].
2. Increase in Good Infrastructure Investment attracts investment both domestically and abroad. Investors tend to choose locations with adequate infrastructure because this reduces operational risks and costs. Studies show that countries with good infrastructure tend to have higher levels of foreign investment [16].
3. Job Creation Infrastructure development creates jobs both directly and indirectly. Infrastructure projects such as the construction of roads, bridges, and other public facilities require significant

labor. In addition, good infrastructure supports the growth of other economic sectors such as manufacturing, services, and trade, which in turn creates more jobs [17].

Impacts and Challenges of Transportation Infrastructure Development to Support Economic Growth in the Batu Bara Regency Region

Access to Basic Services Adequate infrastructure increases people's access to basic services such as education, health, and clean water. The construction of good schools and educational facilities supports an effective teaching and learning process, which ultimately improves the quality of human resources. Health infrastructure such as easily accessible hospitals and clinics improves the accessibility of healthcare services, which can lower mortality rates and increase life expectancy. **Improving Mobility and Connectivity** A good transportation network improves community mobility and connectivity between regions. This allows people to access economic opportunities, education, and other services more easily. Good connectivity also strengthens social and economic integration between regions, reducing regional inequality. **Improving Environmental Quality** Infrastructure designed with environmental sustainability in mind can improve people's quality of life by reducing pollution and improving air and water quality. For example, the construction of an efficient public transportation system can reduce the use of private vehicles, which in turn reduces greenhouse gas emissions and traffic congestion [18]

Budget Limitations One of the main challenges in infrastructure development is budget limitations. Many developing countries face difficulties in allocating sufficient funds for large infrastructure projects. This often results in project delays or cancellations [19]. **Inequality Between Regions** There is a significant inequality in the availability and quality of infrastructure between urban and rural areas. Rural areas are often underserved by basic infrastructure, resulting in widening economic and social disparities [20]. **Sustainability and Adaptation to Climate Change** Infrastructure development must consider aspects of sustainability and adaptation to climate change. Green and environmentally friendly infrastructure is becoming increasingly important to reduce negative impacts on ecosystems and address climate change issues. The implementation of advanced technologies in infrastructure is also needed to improve efficiency and sustainability. Economic growth is highly dependent on effective infrastructure. Good transportation infrastructure, such as highways, ports, and airports, increases efficiency in the distribution of goods and services. This reduces logistics costs and travel time, which in turn increases the competitiveness of products in the global market. For example, the construction of toll roads connecting major cities with remote areas allows for faster and cheaper delivery of goods, which not only benefits producers but also consumers through lower prices and wider product availability [21]. In addition, an integrated transportation network supports workforce mobility, allowing them to work in previously unreachable locations.

Improving accessibility through improving transportation infrastructure is the main key in encouraging development in an area, including the district. Good transportation infrastructure

creates conditions that support economic growth, community welfare, and connectivity between regions. The following is an opinion on the role of transportation in the development of Batu Bara Regency: First of all, improving transportation infrastructure opens up new opportunities in the economy. Good accessibility allows for smoother movement of goods and services, connects producers with consumers, and creates efficient supply chains. Thus, the growth of the local economic sector can be increased, create jobs, and increase people's income. Furthermore, efficient transportation strengthens connectivity between regions. Well-connected districts have the potential to optimize the economic potential of each region. This creates opportunities for the development of certain sectors, such as tourism, agriculture, and local industries, which in turn can make a significant contribution to the economy of Batu Bara Regency.

It is important to remember that good transportation also improves access to health services and education. People who can easily access health facilities and schools will benefit directly from improving their quality of life. This also opens up opportunities to improve the level of health and education in Batu Bara Regency. In addition, improving transportation infrastructure supports a more equitable distribution of development benefits. All areas in the Regency can feel an increase in accessibility, not only developed areas. It creates equality in opportunities and development between regions, preventing economic and social disparities. The importance of transportation in the development of the district is also related to the growth of the tourism sector. Regencies with good accessibility have more attraction for tourists. Tourist destinations, natural attractions, and unique local cultures become more accessible, creating additional revenue potential and preserving local heritage. Overall, transportation plays a central role in shaping the future of the district's development. Increased accessibility creates a positive domino effect, drives various economic sectors, improves people's living standards, and promotes social inclusion. Therefore, prudent investment and careful planning in the development of transportation infrastructure will be a key step in designing a sustainable and inclusive future for Batu Bara Regency.

The development of transportation infrastructure is a crucial element to support economic growth, especially in developing areas such as Batu Bara Regency, North Sumatra. As an area that has great potential in the industrial, agricultural, fishery, and tourism sectors, investment in transportation infrastructure can provide a significant boost to various economic sectors.

Here are some important aspects that can be considered in the development of transportation infrastructure for Batu Bara Regency:

1. Accessibility and Connectivity

Good transportation infrastructure will increase accessibility to various areas in and around Batu Bara Regency. Adequate road connectivity between economic centers, ports, and production areas will facilitate the flow of goods and services. For example, the development of a toll road network or the repair of arterial roads that connect this district with major cities in North Sumatra, such as Medan and Kisaran.

2. Expansion of Kuala Tanjung Port

Kuala Tanjung Port, located in Batu Bara Regency, has the potential to become a strategic international port. The development of this port can attract investment in the manufacturing industry and international trade, as well as facilitate the export of commodities such as palm oil, rubber, and marine products. This port can also be an important logistics hub in the western region of Indonesia.

3. Rail Transportation

The development of a railway line connecting Kuala Tanjung Port with other cities in North Sumatra, as well as access to the national rail line, will increase the efficiency of freight transportation. Trains can be a cheaper and environmentally friendly transportation option compared to truck-based land transportation.

4. Marine Transportation and Fisheries

Batu Bara Regency is also known for its great fisheries potential. Improving access to sea transportation, by building small wharves for fishermen and developing fishing port infrastructure, will help optimize fish catches and facilitate the distribution of fishery products to a wider market, including international markets.

5. Public Transportation

To support inclusive economic growth, the development of public transportation in Batu Bara Regency is important. The provision of comfortable and efficient public transportation, such as buses or other mass transportation, will help reduce congestion and increase community mobility within the region.

6. Tourism Development

Good transportation infrastructure will strengthen the tourism sector in Batu Bara Regency. Increased access to tourist destinations, both beach and cultural tourism, will attract more tourists and create new business opportunities for the local community.

7. Government-Private Collaboration

To ensure the continuity of efficient transportation infrastructure projects, local governments need to collaborate with the private sector through the Public-Private Partnership (PPP) scheme. This can reduce the burden on the government budget while encouraging innovation and efficiency in the implementation of large projects.

8. Economic Impact

The development of transportation infrastructure will open up opportunities for small and medium enterprises (SMEs) and increase employment. Better access to local and international markets will provide benefits for producers in Batu Bara Regency. In the end, adequate infrastructure will increase the economic competitiveness of this area.

9. Environmental Policy

The development of transportation infrastructure needs to consider environmental aspects. The use of environmentally friendly technology, the reduction of carbon emissions from vehicles, and sustainable spatial planning need to be considered so that economic growth does not damage the local ecosystem. With the development of the right transportation infrastructure, Batu Bara Regency can become a more competitive and sustainable region, both in the context of the regional and national economy.

Conclusion

Based on the results of the research and discussion in the previous chapter, it can be concluded as follows:

The development of transportation infrastructure in Batu Bara Regency is the key to encouraging regional economic growth. The conclusions of this development can include several main points: **Improved Connectivity:** Good transportation infrastructure will improve connectivity between regions, facilitate the flow of goods and services, and increase accessibility for the community. Good roads, railways, and efficient port facilities will accelerate the distribution of products, especially from strategic sectors such as agriculture, fisheries, and the processing industry. **Investment Attractiveness:** Adequate infrastructure will be an attraction for investors. Investors tend to be more interested in areas that have good transportation infrastructure because it facilitates logistics and business operations. This can increase labor absorption and open up new jobs.

Reduced Transportation Costs: The development of efficient transportation infrastructure can reduce the cost of distributing goods and services. This will have an impact on increasing the competitiveness of local products in regional, national, and even international markets. **Tourism Growth:** Batu Bara Regency has great tourism potential, and good transportation infrastructure will support the development of the tourism sector. Easier access to tourist destinations will increase the number of tourist visits, which ultimately increases regional revenue. **Improving the Quality of Life of the Community:** With better infrastructure, people's mobility will increase, making it easier to access public services such as education and

health. In addition, the reduction of congestion and the improvement of transportation safety will improve the overall quality of life.

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