Geografika Journal (Geografi Lingkungan Lahan Basah)
Vol. 5, No. 1 - July 2024
Geography Study Program, Lambung Mangkurat University

Sustainable Transportation Infrastructure Development (Case Study: Tanah Bumbu Regency)

Nasruddin[1], Iphan Fitrian Radam[2], Mahyuni[3], Selamat Riadi[1*], Inu Kencana Hadi[1], Dyah Hartati Dewi[4], Rahmawati[4]

[1,]Geography, Lambung Mangkurat University, Banjarmasin, Indonesia
[2]Civil Engineering, Lambung Mangkurat University, Banjarbaru, Indonesia
[3]Government Studies, Lambung Mangkurat University, Banjarmasin, Indonesia
[4]Bappedalitbangda, Tanah Bumbu Regency Government, Tanah Bumbu, Indonesia

[*]Correspondent Email: Selamattriadi@ulm.ac.id

Received 2024-06-25 | **Revision** 2024-07-20 | **Accepted** 2024-07-31
Geography Study Program, Lambung Mangkurat University

Abstract: The development of a region's transportation infrastructure is very important to increase economic growth. Infrastructure is the foundation for Indonesia to be competent with other countries and provides a multiplier impact that can encourage economic growth. This means, that one of the main elements of development policy to support economic activity is the provision of transportation infrastructure. One of the regional governments' responsibilities is to provide transportation infrastructure as a commodity with a public dimension (public good). This means that local governments are directly involved in providing transportation infrastructure as a complement to the economic system. The results of this research show that the regional hierarchy of Tanah Bumbu Regency is influenced by population density and the almost even distribution of public facilities, as well as interconnections between regions. For this reason, the Tanah Bumbu Regency government needs to respond to this situation by formulating a strategy for developing sustainable transportation infrastructure.

Keywords: *Regional Geography, Sustainable Transportation, Regional Development Planning*

INTRODUCTION

According to Law No. 22 of 2009 concerning Road Traffic and Transportation, the Government is responsible for providing safe, secure, comfortable, and affordable public transportation. The transportation system provides accessibility so activities run as their objectives and will continuously develop. Sustainable transportation, also known is defined as transportation that serves the main purpose of driving the economy of urban areas and social development that can meet the needs of future generations (Sofaniadi et al., 2022).

Developing a region's transportation infrastructure is very important to increase economic growth (Wunas & Natalia, 2015).

Infrastructure is the foundation for Indonesia to be competent with other countries and provides a multiplier impact that can encourage economic growth. This means that one of the main elements of development policy to support economic activities is the provision of transportation infrastructure(Harahap et al., 2023; Zhang et al., 2021).

One of the regional governments' responsibilities is to provide transportation infrastructure as a commodity with a public dimension (*public goods*). The local government is directly involved in providing transportation infrastructure as a complement to the economic system.

Management of transportation infrastructure that is less than optimal implies that regions with low-quality infrastructure will find it difficult to compete with other regions in attracting investors (Arif et al., 2023; Juantoro et al., 2020).

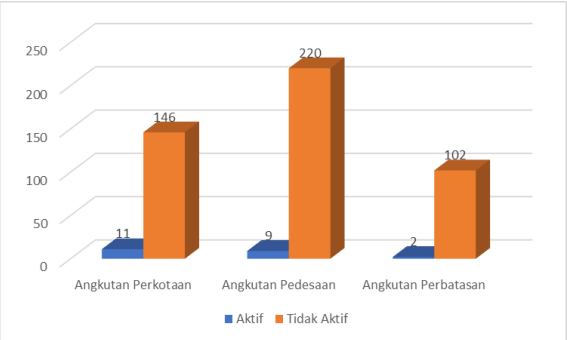
The law No. 22 of 2009, concerning road traffic and transportation as having a strategic role in supporting development and national integration as an effort to advance general welfare; safe, secure, orderly, smooth traffic, and road transportation services, integrated with other modes of transportation to encourage the national economy, general welfare, unity, upholding the dignity of the nation; traffic ethics and national culture; and legal enforcement and certainty. UU no. 38 of 2004 concerning Roads; UU no. 22 of 1999 concerning Regional Government Law no. 32 of 2004.

If a region wants the economy to advance, then the priority is infrastructure development, it is transportation infrastructure, especially roads, ports, and airports. The reliable transportation infrastructure that is built is expected to have a positive effect on improving the regional economy (Hanafi et al., 2023).

The transportation infrastructure development is an important factor for regional development, poverty alleviation, and reducing disparities between regions (Soleh, 2017).

South Kalimantan has natural, cultural and culinary charm resources that exist in various regions that are not yet widely known by the public and have not been well managed by the government (Normelani et al., 2022). It is intended for all regions in Indonesia, including Tanah Bumbu Regency, South Kalimantan Province.

Figure 1. Status of Transport Routes in Tanah Bumbu Regency, South Kalimantan Province, 2023



Source: Tanah Bumbu Regency Transportation Service

LITERATURE REVIEWS

1. Area Development

Regional development planning is an effort to apply economic development concepts to the spatial dimension, so regional development planning is an uninterrupted accumulation of economic development concepts that look at opportunities and supply (*opportunity and supply side*), namely from the ability or potential of the region to develop, and from a demand perspective as an opportunity (*demand side - market opportunity*) to develop (Harun, 2010). The concept of regional development is intended to reduce growth gaps and welfare disparities between regions (Sarwo et al., 2019). Based on the understanding, development should not only be carried out to fulfill partial sectoral objectives, but more than that, it should be carried out to fulfill comprehensive and holistic regional development objectives by considering the harmony between various resources as the main elements that form space (source natural, artificial, human resources and activity systems), which are supported by the legal system, and institutional systems that surround them (H. Hariyanto & Tukidi, 2007).

2. Sustainable Transportation

Sustainable development has emerged as an important concept to correct development that is oriented towards economic growth and often ignores the sustainability of natural/environmental resources and local social entities. In this concept, economic growth is achieved without sacrificing social goals or environmental integrity (Harun, 2010).

The fairly high level of economic growth in urban areas has attracted a high flow of urbanization, for many people this promises wider job opportunities. This causes high levels of population and worker growth in this region (Tamin, 2007). So, this leads to a transportation system to provide accessibility (convenience) for every user, goods, and services fairly. Transportation planning is a good way to involve every community that will be affected by the planning.

Sustainable transportation in terms of transportation facilities tends to fulfill infrastructure aspects and their integration with transportation facilities to obtain facilities that are inclusive and have sustainable aspects (Tavassoli & Tamannaei, 2020). The sustainability of the transportation system tends to fulfill priority transportation facilities such as pedestrians, disabled people, bicycles, and public transportation, as well as fulfilling indicators of comfort, safety, and ease of access for people or customers (Yogatama, FF, & Fadhillah, 2023).

3. Sustainable Transportation Infrastructure Development Strategy

Strategy formulation requires efforts in the form of systematic stages and consideration of resources to produce strategic steps. The most important activity of development is planning, because planning determines the direction, priorities, and development strategies (Soni et al., 2022).

The relatedness between transportation infrastructure, economic growth, and people's quality of life cannot be ignored. Efficient transportation infrastructure not only facilitates the flow of goods and services, but also promotes social inclusivity, reduces regional disparities, and increases accessibility to public services. On the other hand, negative impacts such as pollution and environmental degradation provide a clear signal that conventional transportation models must be updated to be more suitable with sustainability principles (Mashuri, 2024).

4. Public Transportation Services

Transportation in today's life has become a very important basic need, especially for urban communities. The function of transportation in urban activities has an important role that influences all aspects or sectors of life. People need public transportation in addition to private vehicles as a means of supporting transportation for daily activities to meet their needs (Nurfadillah et al., 2023).

Nowadays, transportation in various big cities in Indonesia has a very varied public transportation network, including urban transportation, taxis, trains, ships, crossings, and airplanes (Idayanti, 2023). Changing modes of transportation occur when passengers change from one of transportation to another transportation or change modes between two services of the same mode. If transfers between these modes of transportation can be made easier, more affordable, better, and more comfortable, then the integration and

flexibility of the network as a whole will develop rapidly (Ode & Mote, 2023).

RESEARCH METHODS

1. Research design

The research design uses a quantitative and qualitative descriptive approach (Mixed Method), with survey methods (observation, interviews, and documentation). Data analysis uses Geographic Information Systems (Network Analysis), Regional Gravity Analysis, Scalogram, Regional Hierarchy, and SWOT Analysis.

2. Population and Sample

The population in this research is all roads and transportation systems, as well as stakeholders (policy stakeholders) in Tanah Bumbu Regency. These components were selected based on the results of a previous literature review which also included buildings from various types of land use within the radius of the transit area.

Meanwhile, the stakeholders who make up the population are those who have interests and influence related to TOD policies. The sampling in this research was from buildings in land use types in transit areas based on consideration of several criteria and stakeholders who have high interest and influence in the research. The selected stakeholders will later become research respondents. The respondents in the sample were selected directly by the researcher according to their needs and had specific characteristics.

3. Variable

The variables compiled include land, ASDP, and air transportation facilities and infrastructure (road, port, and airport infrastructure), load factor, service policy, and collaboration policy.

RESULTS AND DISCUSSION

1. Territory Hierarchy

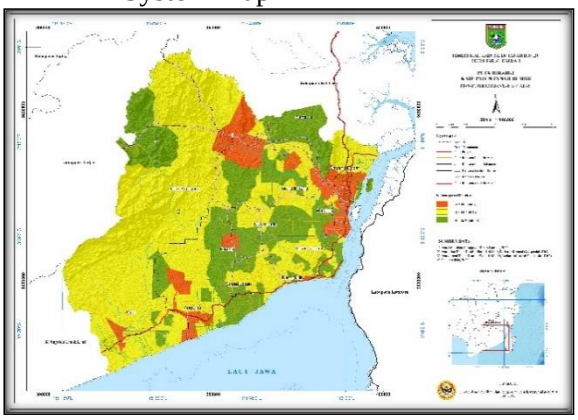
City hierarchy is the most efficient system in carrying out regional development. By creating a hierarchy of regional development centers (cities), the process of regional growth and development can be accelerated (A. Hariyanto, 2007). An urban hierarchy describes the level of urban function as a result of differences in the number, type, and quality of facilities available in the city. Based on these differences, the volume and diversity of services that can be provided by each type of facility are also different (Patrik et al., 2021).

The regional hierarchy of Tanah Bumbu Regency is influenced by population density and the almost even distribution of public facilities. In this case, the hierarchy is made with 3 (three) levels, namely Hhierarchy I, II, and III. Tanah Bumbu Regency has 157 villages, 29 of which are in Hierarchy I, while the other 128 are in hierarchy III.

Areas with Hierarchy I or the distribution of service facilities describe the village's ability to develop the area. This is because the greater the service function achieved, the greater the geographical orientation of the population to obtain services or the greater the geographical attractiveness of the village to the surrounding area and the greater the service linkages that occur. Almost all facilities are owned by villages with Hierarchy I, namely educational, health, and economic facilities. Regions with Hierarchy II are regions with a medium level of development, that is, they do not have adequate supporting infrastructure for regional development. Regions with Hierarchy III have a relatively large population and are also close to the sub-district capital. The availability of public facilities in Hierarchy III is quite

numerous, but not evenly distributed. The number of service facilities has a gap, especially in basic service facilities, namely education.

Figure 1. Tanah Bumbu Regency Hierarchy System Map



2. Interregional Interconnection

Regional interconnection is closely related to infrastructure accessibility, such as roads, modes of transportation, internet, and so on. Tanah Bumbu Regency has a very large area, namely 487,789 hectares. This raises problems about ties between sub-districts. Several sub-districts in Tanah Bumbu Regency have quite difficult access, as evidenced by the existing road infrastructure (DPUPR Road Data for Tanah Bumbu Regency, 2023) in the form of dirt and gravel. Based on the 2017–2037 RTRW document, it is explained that the planned Tanah Bumbu Regency will be traversed by a network of railways and toll roads. Of course, this will be very helpful in terms of interconnection.

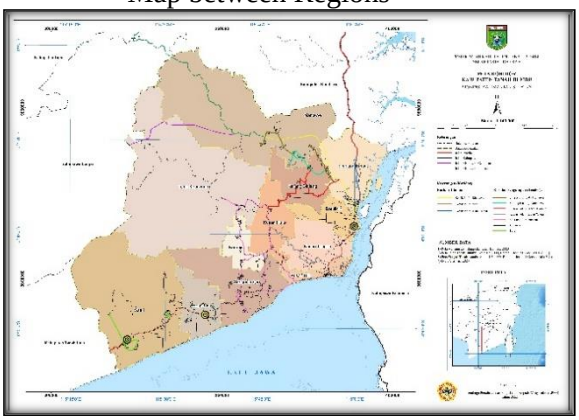
Based on the problems above, an alternative interconnection between sub-districts can be created, which in this case is a mode of transportation. The interconnection of transportation modes in question is a corridor system. The corridor system includes several adjacent sub-districts to form one interconnected route.

Based on the results of the analysis, 3 main corridors and 9 feeder corridors are obtained, namely:

a) Main Corridors: Kersik Putih – Satui, Kersik Putih – Batu Ampar, and Kersik Putih – Mantewe.
b) Feeder Corridor: Satui; Angsana; Karang Bintang – Mantewe; Kusan Hulu – Karang Bintang; Sungai Loban – Kusan Hulu; Sungai Loban – Kuranji – Teluk Kepayang; Kusan Hulu –Kusan Tengah; Simpang Empat – Mantewe; Karang Bintang – Mantewe.

These corridors can later be created using corridor codes, for example, feeder corridors (Satui Corridor and Angsana Corridor) with the codes "TBKP1", "TBKP2". TB is an abbreviation of Tanah Bumbu, KP is an abbreviation of Feeder Corridor, and the number after it is the order of the corridor.

Figure 2. Interconnection Corridor System Plan Map between Regions



3. Sustainable Transportation Infrastructure Development Strategy in Tanah Bumbu Regency

Based on the results of the SWOT analysis carried out, the strategy for developing sustainable transportation infrastructure in Tanah Bumbu Regency is as follows:

1. Strengths-Opportunities (SO) Strategy
   a) Development of Land Transport Systems (National Roads) Kersik Putih-Satui Corridor and Kersik Putih-Batu Ampar Corridor
   b) Development of the Land Transport System (Cempaka-Mantewe Inter-Regency Road) and the Kersik Putih-Mantewe Corridor.
   c) Development of a Land Transport System (Feeder) that connects growth centers (PKW, PKL, and Sub PKL) and strategic areas
   d) Development of an integrated bus stop system between Tanah Bumbu Regency and South Kalimantan Province
   e) Preparation of Pilot Land Transport System Procurement Program in remote areas
   f) Preparation of Mass/Public Land Transport System Procurement Program through National and Private Cooperation
2. Weakness-Opportunity (WO) Strategy
   a) There is competition with other regions in providing friendly, safe, and affordable public transportation services
   b) Affordable motor vehicle loans
   c) There are no provincial or national policies that accommodate the provision of sustainable public transportation
3. Strength-Threat (ST) Strategy
   a) Exploring cooperation with other regions in providing sustainable public transportation services
   b) Procurement of sustainable public vehicles through APBD, APBN, and CSR
   c) Building communication and coordination between the Tanah Bumbu Regency Government, the South Kalimantan Provincial Government, and the Central Government.
4. Weakness-Threat Strategy (WT)
   a) Recruitment of green taxi drivers (feeders) for the development of the Trans Tanah Bumbu Bus
   b) Socialization about the importance of comfortable, safe, and affordable public vehicles
   c) Tanah Bumbu Regency Government initiative to encourage sustainable public transportation procurement policies by the South Kalimantan Provincial Government and the Central Government.

CONCLUSION

The development of sustainable transportation infrastructure is the basis for the development of an urban area characterized by environmentally friendly, efficient, safe, and inclusive modes of transportation. In this context, this research explores in depth the various aspects involved in designing and implementing responsive transportation infrastructure in the future, namely, the complexity of the challenges and solutions of the Tanah Bumbu Regency government, integration of technology and sustainability, the role of government policy and support, stakeholder involvement, environmental and social impacts, societal acceptance of new technologies.

THANK YOU NOTE

Thank you to the Bappedalitbang, Tanah Bumbu Regency, South Kalimantan, which has funded this research.

REFERENCE

Arif, F. N., Sultan, M. A., Saputra, M. T. Y., & Muhammad, A. H. (2023). Study of the Level of Satisfaction of Transportation Infrastructure Users in North Halmahera Regency. *Journal of Civil Science*, *6*(2), 119–132.

Hanafi, I., Pujowati, Y., & Muhtadi, M. A. (2023). Pengaruh Pembangunan Infrastruktur Transportasi Berkelanjutan terhadap Mobilitas dan Lingkungan di Kalimantan. *Jurnal Multidisiplin West Science*, *2*(10), 908–917.

Harahap, M. A. K., Supriandi, S., Tanipu, F., & Manuhutu, A. (2023). Relations between Architecture, Urban Planning, Environmental Engineering, and Sociology in Sustainable Urban Design in Indonesia (Literature Study). *Jurnal Geosains West Science*, *1*(02), 77–88.

Hariyanto, A. (2007). Percepatan Pengembangan Wilayah Melalui Strategi Implementasi Wilayah Pengembangan (WP) Dan Hirarki Kota-Kota. *Jurnal PWK Unisba*, *7*(1), 21–51.

Hariyanto, H., & Tukidi, T. (2007). Concept of Regional Development and Spatial Planning in Indonesia in the Era of Regional Autonomy. *Journal of Geography*, *4*(1), 1–10.

Harun, U. R. (2010). Model Perencanaan Pengembangan Wilayah Kepulauan Nusa Tenggara. *Jurnal Perencanaan Wilayah Dan Kota*, *10*(1).

Idayanti, S. (2023). Idayanti, Soesi. (2023). Transportation Law. Tri Star Mandiri : Banten. In *Fahum.Umsu.Ac.Id/*.

Juantoro, E. E., Lakawa, I., & Sufrianto, S. (2020). Kajian Infrastruktur Transportasi Darat Dalam Pengembangan Wilayah Kecamatan Tongauna Kabupaten Konawe. *Sultra Civil Engineering Journal*, *1*(2), 44–53.

Mashuri, J. (2024). Sustainable Transport Infrastructure Development for the Future. *Civil Student Assignments*, *1*(1).

Normelani, E., Putri, A., Efendi, M., & Danarto, W. P. (2022). Strategic Location and Development of Natural Resources Potential in South Kalimantan. *Jurnal Geografika (Geografi Lingkungan Lahan Basah)*, *3*(2), 67. https://doi.org/10.20527/jgp.v3i2.6778

Nurfadillah, Sani, K. R., & Wahid, A. (2023). Public Transportation Policy in Improving Services to the Community: Case Study of Using Transjogja. *Sawala : Journal of Public Administration*, *11*(1), 54–66. https://doi.org/10.30656/sawala.v11i1.5834

Ode, S., & Mote, M. (2023). Implementation of Integrated Transportation in Cities. *Jurnal Kebijakan Publik*, *014*, 337–343.

Patrik, L. R., Rotinsulu, W. C., & Jocom, S. G. (2021). Hierarchy Analysis of Urban Service Centers in Bitung City. *Agri-Socio Economics*, *17*(2 MDK), 541–548.

Sarwo, A., Sudrajat, E., Sundaro, H., & Riptek, J. (2019). Analysis of Semarang City Regional Development Based on Regional Superior Potential. *Riptek Journal*, *13*(1), 29–38. http://riptek.semarangkota.go.id

Sofaniadi, S., Huda, M., & Hartawan, F. (2022). Sustainable Transportation and Its Effect on Emission Reduction in Semarang City. *Riptek Journal*, *16*(1), 81–89.

Soleh, A. (2017). Village potential development strategy. *Sungkai Journal*, *5*(1), 32–52.

Soni, Aprianto, Karman, & Sugandi, W. (2022). Accelerating Infrastructure Development for Community-Based Settlement Development in Jayawijaya Regency, Papua Province, Indonesia. *Georafflesia Journal, 7 (2).*, 270–274.

Tamin, O. Z. (2007). Menuju Terciptanya Sistem Transportasi Berkelanjutan di Kota-Kota Besar di Indonesia. *Jurnal Transportasi*, *7*(2), 87–104.

Tavassoli, K., & Tamannaei, M. (2020). Hub network design for integrated Bike-and-Ride services: A competitive approach to reducing automobile dependence. *Journal of Cleaner Production*, *248*, 119247.

Wunas, S., & Natalia, V. V. (2015). Pembangunan Infrastruktur Transportasi di Kota Makassar. *Jurnal Transportasi*, *15*(3).

Yogatama, FF, & Fadhillah, E. (2023). Analysis of Sustainable Transportation Facilities in the Sinjai Regency Central Market Area: Pedestrian and Public Transportation. *Proceedings of the Inter-University Transportation Studies Forum*, *10*(2), 667–674.

Zhang, J., Peng, X., Ouyang, Y., Ballesteros-Pérez, P., Ke, Y., Lu, Q., Li, H., & Skitmore, M. (2021). Environmental life cycle impact assessment of transportation infrastructure: A multi-case study in international perspective. *International Journal of Sustainable Transportation*, *16*(11), 1020–1031.