

Evaluation of Community-Based Transportation Programs and Their Impact on Social Connectivity in West Nias Regency

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Abstract - This study aims to evaluate community-based transportation programs in West Nias Regency and analyze their impact on social connectivity, especially related to increased access to basic services such as education, health, and the economy. This program aims to improve transportation infrastructure, improve road conditions, and strengthen transportation systems that support community mobility. Based on the available data, despite the increase in paved road length and improved road conditions, major challenges are still faced, especially related to heavily damaged roads and limited public transportation. Existing community-based transportation programs have not been fully able to support optimal social connectivity between regions in West Nias. The study found that community participation and collaboration with the private sector are key to the sustainability and effectiveness of the program. The results of the study show that to overcome the existing challenges, there needs to be a more intensive road maintenance strategy, the development of affordable and integrated public transportation, and more active tourism promotion to support the regional economy. This study suggests that stakeholders increase cooperation between the government, community, and the private sector to optimize community-based transportation programs, which in turn will improve social connectivity and community welfare in West Nias Regency.

Keywords : *evaluation, community-based transportation, social connectivity, West Nias, infrastructure.*

I. INTRODUCTION

The program to provide public facilities, especially transportation in the West Nias Regency area, with an area of 520.34 km² and a population of 97,633 people as of June 30, 2023, faces significant challenges in the management and development of infrastructure to support the growing needs of its community. The population density level of around 190 people per km² shows that the need for adequate public facilities is increasingly urgent, especially related to transportation infrastructure which plays an important role in supporting people's economic and social activities.

Along with the enactment of Law No. 32 of 2004 and Law No. 33 of 2004, which gives wider authority to the Regional Government in managing and developing the potential of its

area, there is a great opportunity to improve accessibility and quality of life in West Nias Regency. Local governments now have the flexibility to design and implement development programs that are oriented towards strengthening social connectivity, one of which is through the development of community-based transportation systems. The following is a map of West Nias Regency:

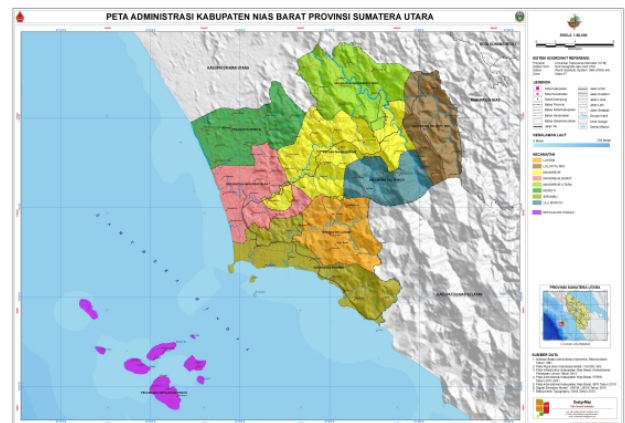


Image: Map of West Nias

Suber: <https://petatematikindo.wordpress.com>

The capital of West Nias Regency, Gunungsitoli, as the center of government and economy, plays a key role in ensuring the availability of efficient and affordable transportation services. Good transportation not only supports people's mobility, but also contributes to the development of tourism potential and the local economy. In this context, community-based transportation is one of the strategic solutions to improve accessibility in remote areas and bridge existing social gaps.

West Nias Regency, as one of the areas with a fairly high population density in North Sumatra Province, faces challenges in providing adequate transportation infrastructure for its citizens. Limited accessibility, especially in remote areas, is still a major obstacle hindering social and economic development in the area. Although the Regional Government has had wider authority in managing and developing the region in accordance with Law No. 32 of 2004 and Law No.



33 of 2004, the realization of optimal transportation infrastructure development is still a homework that needs to be completed.

As one of the solutions, a community-based transportation program has been initiated to overcome this accessibility obstacle. The program aims to empower local communities in the provision of transportation services, which is expected to increase mobility, strengthen social connectivity, and encourage local economic growth. However, the effectiveness of the program cannot be measured comprehensively, so several problems need to be further researched.

Many villages and remote areas in West Nias Regency are still difficult to reach due to the limitations of adequate transportation facilities. This results in limited public access to educational, health, and economic facilities, which can affect their quality of life. This problem requires an in-depth study of the extent to which community-based transportation programs are able to reach isolated areas. In addition, although various community-based transportation programs have been initiated, there has not been a thorough evaluation that assesses the effectiveness of these programs in improving accessibility and social connectivity. It is important to understand whether the program is on target, whether it is able to meet the needs of local communities, and whether it can increase community participation in social and economic activities.

Social connectivity is an important element in encouraging interaction between citizens, strengthening community bonds, and creating social solidarity. With the community-based transportation program, it is hoped that there will be an increase in social connectivity that is able to encourage community-based development. However, the real impact of these programs on social connectivity has not been explored in depth, so further research is needed to identify aspects that need to be improved and developed. In addition, the success of community-based transportation programs is highly dependent on the active participation of local residents. However, the level of community participation in the planning, implementation, and maintenance of this transportation program still needs to be evaluated. Factors that affect participation, such as awareness, support, and community capacity, need to be analyzed to find a more effective approach in engaging them.

This study aims to evaluate the effectiveness of community-based transportation programs in West Nias Regency and how it impacts social connectivity. This evaluation is important to determine the extent to which existing programs have succeeded in creating equitable accessibility, increasing social interaction, and encouraging community participation in regional development. Through this research, it is hoped that improvement and development opportunities can be identified that can strengthen social connectivity and support sustainable development in West Nias Regency.

Problem formulation

1. How is the implementation of community-based transportation programs in West Nias Regency?
2. What are the factors that affect the effectiveness of community-based transportation programs in West Nias Regency?

3. What is the impact of community-based transportation programs on improving social connectivity in West Nias Regency?

Research Objectives

1. To evaluate the implementation of community-based transportation programs in West Nias Regency.
2. To identify the factors that affect the effectiveness of community-based transportation programs in West Nias Regency.
3. To analyze the impact of community-based transportation programs on social connectivity in West Nias Regency.

II. LITERATURE REVIEW

1). Community-Based Transportation

Community-based transportation is a strategy that involves the active participation of the community in the provision and management of transportation systems in an area. This approach is considered effective for improving accessibility, especially in remote areas, where the central or regional government may have limited resources. This program is expected to improve social connectivity, namely relationships and interactions between individuals and groups that affect community solidarity. Community-based transportation refers to a transportation management model that focuses on empowering local communities in the provision of transportation services. According to Litman (2017), community-based transportation provides a space for communities to identify transportation needs, design solutions, and implement services that are appropriate to their local context. These programs can be in the form of providing public transportation by the community, arranging more flexible local routes, or participating in the maintenance of village roads. Several studies, such as those conducted by Suarez et al. (2019), show that community-based transportation is effective in improving access to basic amenities such as education, health, and markets. Thus, this program is often initiated in remote areas or those that have limitations in accessibility.

2). Social Connectivity in a Transportation Perspective

Social connectivity is defined as social relationships and networks of interactions between individuals that can affect social solidarity and cohesion in society (Putnam, 2000). In the context of transportation, social connectivity relates to people's ability to interact, access services, and participate in social and economic activities. A study by Zhang and Zhao (2018) shows that transportation accessibility has a direct correlation with increased social connectivity, especially in rural areas. Community-based transportation can strengthen social connectivity by providing better access to public facilities and strengthening existing social networks. This can have a positive impact on sustainable development, especially in isolated areas such as West Nias Regency.

3). Evaluation of Community-Based Transportation Programs

Evaluation of community-based transportation programs needs to be carried out to understand their effectiveness in achieving the goal of improving accessibility and social connectivity. According to Kothari (2004),

evaluation is a systematic process to collect and analyze data to assess the success of a program based on the initial goals that have been set. In developing countries, the evaluation of community-based transport programs often uses qualitative and quantitative approaches to measure the impact on accessibility and community participation. A study conducted by Porter (2014) in the African region shows that community-based transport impact evaluation can improve quality of life through increased access to health services, education, and local economies.

4). Impact of Community-Based Transportation on Social Connectivity

Several previous studies have shown that participatory managed transportation can increase social interaction within the community. According to Banister (2005), good social connectivity can be achieved if people have easy and affordable access to social activity centers. In West Nias, where the topography and distribution of settlements tend to make mobility difficult, community-based transportation programs can serve as a bridge to strengthen social interaction. Research in various regions shows the positive impact of transportation on social connectivity. A study by Currie and Delbosc (2011) in Australia showed that improved public transport contributed to reduced social isolation and increased community engagement. These findings are relevant in the context of West Nias, where better mobility can open access to various essential services.

III. METHOD

The approach in this study uses a qualitative descriptive methodology. The selection of qualitative approaches is in accordance with the descriptive research theme. The data collection procedure involves four basic types, namely observation, interviews, documents, and visual images (Creswell, 2013). Qualitative descriptive methods are used to obtain secondary data through literature methods or document and literature studies. Secondary data is collected from a variety of sources, including books, theses, journals, legislation, the internet, lecture materials, and mass media. Meanwhile, primary data was obtained through in-depth interviews with resource persons who are experts or related officials who have competence in the field that is the focus of the research, namely the evaluation of community-based transportation programs and their impact on social connectivity in West Nias district.

Data analysis was carried out descriptively with a thematic approach which included data reduction, data presentation, and conclusion drawn.

Result And Discussion

1. Evaluation of the implementation of community-based transportation programs in West Nias Regency.

Based on data on road length and road conditions in West Nias Regency in the period 2021 to 2023, there have been significant developments in improving road infrastructure. In the type of road surface, there was an increase in the length of paved roads from 238.934 km in 2021 to 304.16 km in 2023. This reflects the efforts of local governments to improve accessibility through the provision of better and more durable roads. However, despite the increase in paved roads, the

length of gravel and dirt roads has decreased significantly, especially on gravel roads which decreased from 175,246 km in 2021 to 107.44 km in 2023. This shows that there is a shift in infrastructure development priorities towards more solid and durable roads, reducing dependence on perishable road surfaces.

Table 1. Road Length (KM) in West Nias Regency, 2021–2023:

Jenis Permukaan Jalan / Type of Road Surface	2021	2022	2023
Aspal / Paved	238.934	242.934	304.16
Kerikil / Gravel	175.246	172.246	107.44
Tanah / Soil	164.978	164.978	157.252
Beton / Concrete	61.232	61.232	71.538
Lainnya / Others	0	0	0
Jumlah / Total	640.39	640.39	640.39

Source: Public Works and Spatial Planning Office of West Nias Regency

In terms of road conditions, although the length of roads in good condition has increased, from 116.33 km in 2021 to 126.006 km in 2023, there has been a sharp increase in the number of heavily damaged roads, from 193.99 km in 2021 to 273,531 km in 2023. This shows that although there are repairs on some parts of the road, most of the roads have been damaged quite severely, which has a negative impact on the quality of transportation in West Nias Regency. Badly damaged roads hinder people's mobility, especially in remote areas that rely heavily on good accessibility.

Table 2. Road Conditions in West Nias Regency (km), 2021–2023

Kondisi Jalan / Condition of Roads	2021	2022	2023
Baik / Good	116.33	119.328	126.006
Medium / Moderate	170.16	170.164	153.302
Rusak / Damage	159.91	156.912	87.551
Rusak Berat / Severely Damaged	193.99	193.986	273.531
Jumlah / Total	640.39	640.39	640.39

Source: Public Works and Spatial Planning Office of West Nias Regency

In the context of community-based transportation programs, an evaluation of the implementation of these programs shows that despite efforts to improve road infrastructure, the main challenge is still in the maintenance and repair of existing roads. Budget and resource constraints may be a major factor hindering the speed and sustainability of road repairs. Therefore, community-based transportation programs need to be more focused on empowering the community in maintaining and maintaining existing roads, as well as involving them in planning and managing road infrastructure in a sustainable manner. This is important to ensure that the improvement of road infrastructure can provide maximum benefits to the community, especially in improving social connectivity and economic mobility in West Nias Regency. Based on traffic accident data that occurred in West Nias Regency in 2023, a total of 6 accidents were recorded, which occurred in several sub-districts such as Sirombu, Lahomi, Lolofitu Moi, West Mandrehe, and Moro'o. Other sub-districts, such as Ulu Moro'o, North Mandrehe, and Mandrehe, were not recorded as having accidents. This

relatively low accident rate may indicate better efforts in traffic management and public awareness of driving safety. However, this data also needs to be further researched to understand the causative factors and accident-prone locations.

Table 3. Number of vehicles in West Nias, 2023.

POLICE/TA	MP	BUS	MB	MOTORBIKE	RANSUS	TOTAL	%
West Nias	104	1	23	1,023	2	1,153	0.01

Source: korlantas.polri.go.id

The number of vehicles recorded in West Nias Regency in 2023, with details of registered vehicles including passenger cars (MP), buses, goods cars (MB), motorcycles, and other vehicles (RANSUS). In total, West Nias Regency is recorded to have 1,153 vehicles, which only contributes 0.01% of the total number of vehicles throughout North Sumatra. The number of vehicles in West Nias is relatively small compared to other districts in North Sumatra, this reflects several important factors. First, the limited number of vehicles may be due to geographical conditions and still limited transportation infrastructure, which reduces the attractiveness of personal or commercial vehicle use. Second, the high proportion of motorcycles (1,023 vehicles) shows that motorcycles are still the top choice for people for daily mobility, perhaps because they are more flexible and can access narrower or less good lanes. However, the relatively low number of vehicles also reflects the challenges in developing a more inclusive transportation infrastructure, which needs to be improved to support economic growth and better connectivity in the region.

Despite significant improvements in transportation infrastructure in West Nias Regency between 2021 and 2023, major challenges in terms of social connectivity remain, especially when compared to other districts in North Sumatra. The community-based transportation programs that have been implemented show progress, such as increased length of paved roads and better road conditions, with 126 km of roads in good condition by 2023. However, there are still about 273,531 km of heavily damaged roads, which limits people's mobility, especially in remote areas. This has an impact on people's access to basic services, such as education, health, and economic centers, which in turn exacerbates social inequalities between regions.

Compared to other districts that have more advanced transportation infrastructure such as Medan or Pematang Siantar, West Nias Regency is still lagging behind in terms of social connectivity and community mobility. To catch up with this lag, local governments need to accelerate the repair and maintenance of existing road networks, as well as introduce more efficient public transportation systems. In addition, community-based transportation programs need to include more integrated initiatives, such as driving skills training, driving safety campaigns, and engaging the community in local transportation management. With these steps, it is hoped that social connectivity in West Nias Regency can increase and encourage more equitable economic growth throughout the region.

2. Factors that affect the effectiveness of community-based transportation programs in West Nias Regency.

To identify the factors that affect the effectiveness of the community-based transportation program in West Nias Regency, the available data provide a fairly clear picture of the challenges and progress in the implementation of this program. Based on the analysis of several aspects such as resources, policies, and community participation, it can be concluded that several main factors affect the effectiveness of this program.

a. Infrastructure Resources

Road length data in West Nias Regency shows an increase in paved road length from 238.934 km in 2021 to 304.16 km in 2023. Despite the improvements, most roads in the region are still in a severely damaged condition, reaching 273,531 km in 2023. This reflects the lack of resources to improve road infrastructure comprehensively and sustainably. The state of badly damaged roads in many of these areas hampers the effectiveness of community-based transportation programs, due to the inconvenience and insecurity caused by poor road conditions, thereby reducing people's mobility, especially in remote areas.

b. Transportation Policy and Regulation

In terms of policies, West Nias Regency needs to have more integrated policies to support community-based transportation, such as the provision of adequate public transportation and affordable fare arrangements. Based on traffic accident data that recorded only 6 accidents in 2023, although the number is relatively low, motor vehicles, especially motorcycles, dominate modes of transportation. This indicates that the existing policies have not sufficiently supported the transfer of people from the use of private vehicles (such as motorcycles) to public transportation. For this reason, policies that encourage the development of safer, more comfortable, and affordable public transportation are very important. In addition, policies that focus on road maintenance and improving traffic safety are also needed to support the success of this program.

c. Community Participation

Community participation in community-based transportation programs is an important factor that affects the effectiveness of this program. Data shows that despite the improvement in road infrastructure, people in West Nias Regency still largely rely on private vehicles, especially motorcycles. This reflects the low participation of the community in using available public transportation. Therefore, to increase the effectiveness of community-based transportation programs, it is important to involve the community in the planning and management of existing transportation systems. In addition, education about the benefits of using public transportation, traffic safety, and participation in road maintenance can increase public awareness and participation in supporting the smooth running of this program.

Overall, factors that affect the effectiveness of community-based transportation programs in West Nias Regency include the availability of infrastructure resources, policies that support the development and maintenance of transportation, and active community participation in using and managing existing transportation systems. Local governments need to strengthen transportation policies, improve the quality of infrastructure, and educate and involve the public to realize a more effective and sustainable transportation system.

3. The impact of community-based transportation programs on social connectivity in West Nias Regency.

To analyze the impact of community-based transportation programs on social connectivity in West Nias Regency, we need to evaluate the extent to which improvements in transportation infrastructure and existing policies have increased people's access to basic services, such as education, health, and the economy, as well as facilitated social interaction between citizens.

a. Improved Access to Basic Services

One of the positive impacts of community-based transportation programs in West Nias Regency is the increase in people's access to basic services, especially education and health. With the increase in the length of paved roads, as recorded in 2023, from 238,934 km in 2021 to 304,16 km in 2023, better roads allow people to more easily access educational facilities and health services that were previously difficult to reach, especially in remote areas. Although most of the roads in West Nias Regency are still in a severely damaged condition (273,531 km in 2023), the repairs that have been made to the main roads have opened access for students to reach school more easily and safely. The same is true for patients who need medical services in larger healthcare facilities, which are often located far from settlements.

However, the biggest obstacle that still exists is the condition of damaged roads in several sub-districts, which still hampers public access, especially those living in more remote areas. People living in areas with poor transportation infrastructure still have difficulty accessing education and health services on a regular basis. In other words, despite the improvements, there are still major challenges in ensuring that all levels of society in West Nias Regency can enjoy equal access to basic services.

b. Impact on Economic Activities

Better transportation also has a positive impact on the economic sector in West Nias Regency. Improving connectivity between sub-districts allows goods and services to be traded more smoothly, opening up business opportunities and increasing economic productivity. Community-based transportation programs play a role in connecting economic centers, such as traditional markets and small industrial centers, with residential areas and other areas. With better roads, people can more easily transport their products to the market, which in turn helps to increase family income and create new economic opportunities.

However, despite the increase, the limitations of transportation infrastructure still cause economic inequality between areas with better access and areas that are still remote. Isolated areas with limited access to major highways still struggle to market their local products and gain access to greater economic resources, such as financial institutions and skills training opportunities.

c. Increase in Social Interaction Between Citizens

Another impact of community-based transportation programs is the increase in social interaction between citizens. When connectivity between regions improves, people from various regions can more easily interact, collaborate, and share knowledge, both in social, cultural, and economic activities. For example, people from various sub-districts can more easily gather in community events or other social activities held in sub-district centers or in more developed areas. This not only strengthens relations between citizens, but also strengthens social networks that can support

economic growth and mutual prosperity. However, despite the positive impact on social interaction, this is still limited by inequality in transportation access between regions. Areas that are still isolated with roads that are severely damaged or inaccessible by public transportation are still hampered in harnessing the wider social and cultural potential. People in remote areas may not have the same opportunities to participate in social activities or interact with people in more developed areas, which can widen the social gap between citizens.

West Nias Regency has various opportunities in developing community-based transportation programs, one of which is the abundant tourism potential. With many natural tourist locations, beautiful beaches, and historical and cultural sites, the tourism sector has a great opportunity to boost the local economy. Good and easily accessible transportation will make it easier for tourists to visit these tourist attractions, which in turn will increase the income of the region and the local community. In addition, better access to basic services such as education, health, and economic centers will also open up opportunities for people in remote areas to get better facilities. However, the main challenge faced is the condition of the infrastructure that is still limited, with damaged and hard-to-reach roads, especially in mountainous and coastal areas. This hinders the mobility of people and tourists, as well as reduces the economic potential that can develop.

To address these challenges, strategies that need to be implemented include the maintenance and repair of damaged roads, as well as the development of affordable and interconnected public transportation systems. Effective public transportation will improve social connectivity between citizens and facilitate access to tourist sites and basic services. In addition, active community participation in the management and maintenance of community-based transportation can reduce costs and improve the sustainability of the program. Cooperation with the private sector is also important to improve the quality of transportation and tourism services in this area. Increasing tourism promotion and developing skills training for the community will open up new job opportunities and improve the quality of transportation services. By taking advantage of existing opportunities and facing challenges with the right strategies, community-based transportation programs in West Nias can have a positive impact on improving social and regional economic connectivity.

IV. CONCLUSION

Although there has been significant progress in the development of community-based transportation programs in West Nias Regency in the period 2021 to 2023, this district still lags behind other districts in North Sumatra in terms of social connectivity and transportation infrastructure. Increased paved road lengths and improved road conditions have a positive impact on accessibility, but the main problem faced is the high number of roads that are still heavily damaged, which hinders social and economic mobility in remote areas.

Existing community-based transportation programs have improved connectivity between sub-districts, but their effectiveness is still limited due to uneven infrastructure and lack of an efficient public transportation system. While

districts such as Mandailing Natal, Batubara, Serdang Bedagai, and Karo have been much more advanced in terms of transportation development that supports social connectivity, West Nias Regency still faces major challenges in providing adequate access to basic services such as education, health, and the economy. Therefore, to catch up with this lag, local governments need to prioritize road maintenance and repair, as well as develop a more integrated and efficient public transportation system.

The main strategy that must be implemented. Public transportation that connects between regions will increase mobility between citizens and facilitate access to important tourist sites and facilities. In addition, active community participation in the management and maintenance of community-based transportation is essential to reduce costs and ensure the sustainability of the program. Cooperation with the private sector can also contribute to improving the quality of transportation and tourism services. Increasing tourism promotion and skills training for the community has the potential to open up new job opportunities and improve the quality of transportation services. By implementing the right strategy, community-based transportation programs in West Nias can have a significant positive impact on social connectivity, regional economy, and tourism development.

REFERENCES

- [1] A. Marwazi, C. Nuraini, A. Abdiyanto, A. Sugiarto and F. Millanie, " STUDI AWAL PERENCANAAN WILAYAH KOTA MEDAN," *ARMADA : Jurnal Penelitian Multidisiplin*, pp. 1(12), 1402–1407. <https://doi.org/10.55681/armada.v1i12.1078>, 2023.
- [2]. A.Sugiarto and R. Ramadania, "Economic and Spatial Regional Integration and Its Impacts on Regional Development in North Tapanuli Regency," *Sinomic Journal : International Journal of Social Science, Education, Communication and Economics*, pp. Vol.2, Issue 5 (2023). www.sinomicsjournal.com.
- [3]. Abdiyanto, A., Sinar, T. R. H., Milanie, F., Nuraini, C., & Azhari, I. (2023). Analysis of Determining Service Center Systems towards the Development of The Eastern Part of Medan City. *International Journal Paper Advance and Scientific Review*, 4(4), 91-105.
- [4]. Abdiyanto, *Metode Penelitian Sosial & Sains*, Medan: Penerbit: Aneka Ilmu Semarang. ISBN: 9786239220945., 2020
- [5]. Ackermans, L., & Poelman, H. (2016). Towards Regional and Urban Indicators on Rail Passenger Services, Using Timetable Information.
- [6]. Aidin, A., Akil, A., & Wikantari, R. (2022). Strategi Pengembangan Urban Heritage Tourism Di Kota Makassar. *Plano Madani: Jurnal Perencanaan Wilayah dan Kota*, 11(1), 68-83.
- [7]. C. Nuraini and Suprayitno, " Karakter Lingkungan Perumahan Berbasis Space Attachment yang Adaptif dan Responsif di Mandailing.," *Jurnal Arsitektur NALARs*, Vols. Vol. 20, No. 1 Januari 2021, pp. 61-72 p-ISSN 1412-3266/e-ISSN 2549-6832., 2021.
- [8]. Creswell, J. W. (2013). *Research Design: Pendekatan Kualitatif, Kuantitatif dan Mixed (Edisi Ketiga)*. Yogyakarta: Pustaka Pelajar.
- [9]. Desembrianita, E., Zulharman, Z., Masliardi, A., Asfahani, A., & Azis, A. A. (2023). Optimalisasi Taman Wisata Kelurahan Di Kota Gresik Dalam Menata Lingkungan Yang Menarik. *Community Development Journal: Jurnal Pengabdian Masyarakat*, 4(4), 7823-7830.
- [10]. Herawan, A., & Julia, A. (2022, August). Faktor Penyebab Terhentinya Program Urban Farming Akuaponik di Kota Bandung. In *Bandung Conference Series: Economics Studies* (Vol. 2, No. 2, pp. 355-364).
- [11]. Iwarsson, S., Jensen, G., & Ståhl, A. (2000). Travel chain enabler: Development of a pilot instrument for assessment of urban public bus transport accessibility. *Technology and Disability*, 12, 3–12.
- [12]. Justicia, I. P. (2022). *Partisipasi Masyarakat Dalam Kegiatan Urban Farming Di Masa Pandemi Covid-19 (Studi Kasus: Kelurahan Maharatu Kota Pekanbaru)* (Doctoral dissertation, Universitas Islam Riau).
- [13]. Kadir, A. (2006). Transportasi: Peran dan Dampaknya dalam Pertumbuhan Ekonomi Nasional. *Jurnal Perencanaan dan Pengembangan Wilayah Wahana Hijau*, 1(3), 121–131.
- [14]. Kementerian Perhubungan Republik Indonesia. (2009). Peraturan Pemerintah No.72 Tahun 2009 tentang Lalu Lintas dan Angkutan Kereta Api, Bab I Pasal 1 (1).
- [15]. Kementerian Perhubungan Republik Indonesia. (2011). Peraturan Menteri No.43 Tahun 2011 tentang Rencana Induk Perkeretaapian Nasional: Arah Kebijakan dan Peran Perkeretaapian Nasional, Strategi Investasi dan Pendanaan.
- [16]. Lubis, R. P. (2023). Model Tata Kelola Penyediaan Air Bersih Sebagai Perencanaan Fasilitas Perkotaan Yang Berkelanjutan Di Kota Medan. *Jurnal Teknovasi*, 10(02), 61-68.
- [17]. Lubis, R. P., & Siregar, N. (2024). PERAN SISTEM INFORMASI GEOGRAFIS (GIS) DALAM PENGEMBANGAN INFRASTRUKTUR TRANSPORTASI PERKOTAAN YANG BERKELANJUTAN. *Jurnal Teknovasi*, 11(02), 06-09.
- [18]. Murlok, E. K. (1984). *Pengantar Teknik dan Perencanaan Transportasi*. Civil and Urban Engineering Department, University of Pennsylvania. Jakarta: Penerbit Erlangga.
- [19]. N. A. Rangkuti, C. Nuraini, F. Millanie and A. Sugiarto, " Strategi Tata Kelola Penanganan Pemukiman Kumuh Di Kota Tebing Tinggi.," *Armada : Jurnal Penelitian Multidisiplin*, pp. <https://doi.org/10.55681/armada.v1i12.1082>, 2023.
- [20]. Purwanti, T. (2022). Partisipasi Masyarakat Dalam Program Kota Tanpa Kumuh (Kotaku)(Studi Di Kelurahan Sumber Jaya Kecamatan Kampung Melayu Kota Bengkulu). *Professional: Jurnal Komunikasi dan Administrasi Publik*, 9(2), 623-632.
- [21]. Putra, A. P., Hendarto, T., Wijayanti, R. F., Hayati, N., Agustini, M., Muhajir, M., ... & Sulistiawati, A. (2024). Analisis Partisipasi Masyarakat Pada Kawasan Minapolitan di Kabupaten Trenggalek, Provinsi Jawa Timur. *Jurnal Media Informatika*, 6(2), 330-336.
- [22]. Rahmawati, I., Ariyani, Y. N., & Fitriani, A. (2024). Tingkat Partisipasi Masyarakat dalam Program Urban Farming di Kampung Samtama, Jakarta Pusat. *Desa-Kota: Jurnal Perencanaan Wilayah, Kota, dan Permukiman*, 6(2), 55-67.

- [23]. Risky, F. W. N., & Ramdani, R. (2022). Good Urban Governance Dalam Pembangunan Ruang Terbuka Hijau Kabupaten Bekasi. JURNAL ILMIAH MUQODDIMAH: Jurnal Ilmu Sosial, Politik Dan Humaniora, 6(1).
- [24]. Rusmiatmoko, D., Nursanty, E., & Anita, E. M. S. (2024). Pemanfaatan Green House dalam Pengembangan Urban Farming untuk Masyarakat Perkotaan di Kelurahan Wonolopo. Jurnal Suara Pengabdian 45, 3(3), 69-80.
- [25]. Simonds, J. O. (1994). Garden Cities 21, Creating a Livable Urban Environment. Darby, PA: Diane Publishing Company.
- [26] Tarigan, R. R. A. (2017). PENANAMAN TANAMAN SIRSAK DENGAN MEMANFAATKAN LAHAN PEKARANGAN RUMAH: Ruth Riah Ate Tarigan, Andhika P dan Fuad H. Jasa Padi, 2(02), 25-27.
- [27] SIREGAR, Novawati; TARIGAN, Ruth Riah Ate. Sustainable Mangrove Ecotourism Development Strategy in Aceh Jaya. International Conferance Of Digital Sciences And Engineering Technology, 2025, 2.1: 1-12.