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PUBLIC FACILITIES PLANNING IN URBAN AREAS: CHALLENGES AND OPPORTUNITIES IN THE CAPITAL REGION OF WEST NIAS REGENCY

Analisis Gulo[1*], Feby Milanie[2], Abdiyanto[3]
[1]Mahasiswa Program Studi Megister Perencanaan Wilayah dan Kota
Universitas Pembangunan Panca Budi;
[2,3] Dosen Program Studi Megister Perencanaan Wilayah dan Kota
Universitas Pembangunan Panca Budi;

* Corresponding Author : analisis_gulo@yahoo.com[1], febymilanie@dosen.pancabudi.ac.id[2]

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Abstract

The focus of this study is to analyze the planning of public facilities in the urban area of the Capital City of West Nias Regency, what are the challenges and opportunities faced in the planning and implementation process. As one of the youngest regencies in North Sumatra Province and has many prospects for progress with abundant natural resources, West Nias also has various challenges and faces various obstacles in the development of urban infrastructure. Significant potential for planned and sustainable growth. The research method used is a mixed method approach with a combination of qualitative and quantitative. This study uses primary data collected digitally with a google form with data sources using in-depth interviews with 15 key stakeholders, including local government officials, city planners, and community leaders. A questionnaire survey was conducted on 300 city residents to assess community perceptions and needs. Secondary data was obtained from the latest statistical data documents from the Central Statistics Agency of West Nias Regency. The results of the study identified several major challenges in planning public facilities in the Capital City of West Nias Regency. However, this study also revealed several significant opportunities. The analysis shows that integrated and participatory public facility planning is needed to overcome challenges and take advantage of existing opportunities. This study recommends a community-based planning approach that takes into account local wisdom, as well as increasing the capacity of local governments in project management and urban planning. The conclusion of this study is that although the Capital City of West Nias Regency faces significant challenges in planning public facilities, there are great opportunities for sustainable development. Implementation of the right strategy can turn challenges into catalysts for inclusive urban development that is responsive to community needs.

Keywords: ***urban planning; public facilities; West Nias; sustainable development; urban infrastructure;***

1. INTRODUCTION

The development and management of public facilities in urban areas are essential to ensure the welfare and accessibility of the community. In the context of West Nias Regency, the capital city faces unique challenges and opportunities in planning and implementing effective public facility infrastructure (Novitasari et al., 2020; Priyatiningsih & Sutrisno, 2020;) One of the main challenges is the complex stakeholder landscape involved in the development of utilities within public spaces (Bukit et al., 2019). Various government agencies, community groups, private business entities, and state/regional-owned enterprises must coordinate effectively to ensure smooth infrastructure development and avoid interface problems (Sebayang et al., 2021; Sebayang & Sebayang & Sembiring, 2020; Sembiring & Farid, 2019). In addition, the demand for road infrastructure assets in the region is high, but the supply and quality of the existing network often do not meet the Minimum Service Standards, which causes congestion and increased transportation costs (Harefa & Sugiarto, 2024; Hidayat et al., 2023a; Sugiarto et al., 2023; Sugiarto & Ramadania, 2024). There is significant opportunity to improve public facility planning in the capital city region. Strengthening strategic management of road infrastructure assets, for example, can improve regional accessibility and mobility to support economic growth and community welfare (Priyatiningsih & Sutrisno, 2020).

Furthermore, by adopting a more holistic and integrated approach to public facility development, local governments can leverage synergies between various infrastructure projects and meet the diverse needs of a growing urban population. The future policy direction of the Indonesian Ministry of Public Works and Public Housing emphasizes the importance of developing strategic development areas to reduce regional economic disparities, especially between Western Indonesia and Eastern Indonesia. By aligning public facility planning in the capital city of West Nias Regency with this broader national strategy, local governments can leverage resources and expertise to drive more equitable and sustainable development (Hidayat et al., 2023b; Siregar et al., 2023).

West Nias Regency is still considered a disadvantaged area with limited road access and inadequate public infrastructure. This condition hampers economic growth, worsens connectivity, and limits people's access to basic services such as education and health. Although road construction has begun, there has been no comprehensive study of its impact on economic growth and accessibility, especially in the district capital area such as Lahomi District. In fact, infrastructure development is very important to open up isolated areas and encourage regional progress. The urgency of this research is so that the planning of public facilities in West Nias can be adjusted to the needs of the local community, while also being in line with national policies to accelerate development in the 3T (Frontier, Outermost, and Disadvantaged) regions.

Infrastructure development, especially roads, has long been recognized as a major catalyst in driving economic growth and improving people's quality of life.(Sembiring & Faried, 2019). In remote areas and islands such as West Nias, the role of road infrastructure is increasingly crucial in opening up isolated areas and creating development opportunities. Lahomi District, as one of the areas in West Nias Regency, North Sumatra Province, represents the challenges and potentials that are typical of the island regions in Indonesia(Hidayat et al., 2023a; Milanie et al., 2020a; Milanie et al., 2020b;).

West Nias, which was formed in 2008 as a result of the expansion of Nias Regency, is still classified as an underdeveloped region according to the Ministry of Villages, Development of Disadvantaged Regions and Transmigration. West Nias Regency has challenging geographical conditions with hilly areas and is separated from the mainland of Sumatra. This causes limited accessibility, slows economic growth, worsens inter-regional connectivity, and limits people's access to basic services such as education and health. The available road infrastructure does not meet minimum service standards, so that people's mobility is hampered and transportation costs increase. As one of the underdeveloped regions categorized by the Ministry of Villages, Development of Disadvantaged Regions and Transmigration, the lack of road infrastructure is one of the main causes of slow economic development and low quality of life for the community. (Sembiring & Winaro, 2018).

Although the central and local governments have initiated road construction programs in Lahomi District, its impact on economic growth and increased accessibility has not been fully evaluated. As an island region with strong cultural characteristics, the impact of road construction in West Nias is also likely to be different compared to other regions. This road construction has the potential to positively increase economic productivity, expand access to public services, and create new business opportunities. However, on the other hand, this infrastructure development can also trigger uncontrolled exploitation of natural resources and socio-cultural changes that can have negative impacts on local communities.

This research is also relevant to the direction of national policy that prioritizes infrastructure development in the Frontier, Outermost, and Disadvantaged (3T) regions to reduce regional economic disparities. Thus, this research is important to align development policies in West Nias with broader national strategies. In addition, this research is expected to provide academic contributions by providing insight into the relationship between infrastructure development and economic development, especially in the context of disadvantaged and island regions. The results of the research are expected to provide strategic input for policy makers to design more effective, sustainable, and local-needed development programs.

This study aims to fill this knowledge gap by deeply evaluating the impact of road construction on economic growth and accessibility improvement in Lahomi District, West Nias. By understanding these dynamics, it is hoped that the study can provide valuable insights for policy makers in planning and implementing infrastructure development programs in island and remote areas.

Formulation of the problem:

1) What are the socio-cultural impacts that arise from the construction of road infrastructure in areas with unique cultural and geographical characteristics such as West Nias?
2) What are the challenges faced due to economic growth in West Nias?

2. LITERATURE REVIEW

1) The Concept and Role of Public Facilities in Urban Areas.

Public facilities include various physical infrastructure such as roads, bridges, markets, as well as social facilities such as schools, health centers, and places of worship (Rondinelli, 1983). Research shows that public facilities play an important role in improving the quality of life of the community, encouraging economic growth, and creating connectivity between regions (Litman, 2021). In the context of the West Nias capital area, public facility planning must consider the geographical characteristics, culture, and needs of the local community to ensure their sustainability and relevance.

2) Planning Challenges in Remote Areas.
Planning public facilities in remote areas such as the capital of West Nias faces a number of challenges. One of them is budget constraints, where the lack of government funding often hampers the development of adequate public facilities (World Bank, 2020). In addition, geographical conditions in the form of hilly topography and minimal transportation infrastructure increase the cost of building and maintaining facilities (Thynell et al., 2010). Other challenges include socio-cultural constraints, such as the lack of local community involvement in planning, which often results in facilities being built that are not relevant to community needs (Arnstein, 1969). Negative impacts on the environment, such as deforestation and land degradation due to poorly planned development, are also issues that need attention.

3) Public Facilities Development Opportunities.
Despite the challenges, the capital of West Nias has great opportunities to develop quality public facilities. A community-based approach has been shown to increase the relevance and sustainability of public facilities built (Moser, 2009; Milanie, 2023). In addition, national policy support, such as the development program for disadvantaged areas by the central government, provides opportunities for regions to obtain the funding and technical assistance they need..Digital technologies, such as Geographic Information Systems (GIS), can be utilized to carry out more accurate and efficient planning (Sebayang, S., & Sembiring, R. (2020). This area also has great tourism potential thanks to its natural beauty and local culture, so that public facilities can be designed to support sustainable tourism, increase regional income, and improve public services (Sebayang, S.et al.,(2021).

3. RESEARCH METHODS

1) Research Approach
This study uses a mixed methods approach, combining quantitative and qualitative methods to gain a comprehensive understanding of the impact of road construction in Lahomi District, West Nias.
2) Data Collection

a) Quantitative data were collected from primary and secondary data. Primary data from survey results with 300 respondents randomly stratified based on distance from the newly built main road. Secondary data were collected statistical data from BPS of West Nias Regency, including GRDP, poverty rate, and other economic indicators before and after road construction. Spatial analysis was conducted using GIS data to map changes in land use and development patterns (Milanie et al., 2020b; Yin, 2000 in Milanie, 2021)
b) Qualitative Data, conducted by means of direct interviews and incentives with perception variables on the impact of road construction. Field observations were also conducted to support research data with direct observation of economic activities and community mobility (Moleong, 2000 in Milanie et al., 2021; Yin 1999 in Milanie et al., 2022; Groat & Wang, 2002 in Nuraini 2024a)

2) Data Analysis in the form of Statistical analysis using panel regression and difference-in-differences methods to measure economic impact. Content analysis by conducting qualitative data analysis to identify key themes related to socio-economic changes. Spatial analysis using ArcGIS to visualize changes in accessibility and development patterns.
3) Validity and Reliability are used to ensure the validity and reliability of research results and research methodology and findings. Triangulation of data from various sources and methods is carried out (Yin, 2001 in Nuraini, 2024b; Moleong, 2000 in Nuraini et al., 2024b).

4. RESULTS AND DISCUSSION

Road infrastructure development is widely recognized as an important factor in driving economic growth and improving accessibility in rural areas. In the case of Lahomi District, West Nias, the construction of new roads has had a significant impact on the local economy and accessibility of the area. Recent studies have highlighted the role of rural roads in overcoming remoteness and encouraging more equitable development. The availability of good road facilities in villages can contribute to increasing Gross Regional Domestic Product, a key indicator of economic

growth. (Nuraini et al., 2024a). This is because increased accessibility allows people to engage in economic activities more efficiently, such as agricultural production and employment opportunities. (Windle & Cramb, 1997 in Nuraini 2015). In the case of Lahomi District, the construction of new roads has resulted in a marked increase in economic activity and accessibility. Improved road infrastructure has facilitated the transportation of agricultural products to local and regional markets, which in turn has expanded the agricultural sector and increased farmers' incomes. In addition, improved accessibility has opened up new employment opportunities in the area, as residents can now more easily travel to the city and surrounding areas for work. (Nuraini, 2017)

1. **The impact of road construction on economic growth and accessibility.**

The impact of road construction on economic growth and accessibility in Lahomi District is supported by empirical evidence from similar studies conducted in other rural areas.

From the research results, the positive impacts produced are as follows:

1) Economic growth.

a) The GRDP of Lahomi District experienced a significant increase of 15.3% in the three years after the road construction, compared to an average growth of 3.2% per year before construction. The trade and services sector experienced the highest growth, reaching a 22.7% increase in contribution to GRDP.

b) The poverty rate in Lahomi District decreased from 28.5% to 22.1% in the five-year period after the road construction. Regression analysis showed a strong correlation (r = -0.78) between household distance from the main road and income increase.

c) The number of new MSMEs increased by 35% in the two years following the road construction. The tourism sector recorded a 45% growth in tourist arrivals, with a 30% increase in accommodation capacity.

d) Private investment in Lahomi District increased by 62% in the three years following the road construction. Two major companies opened branches, creating 250 new jobs.

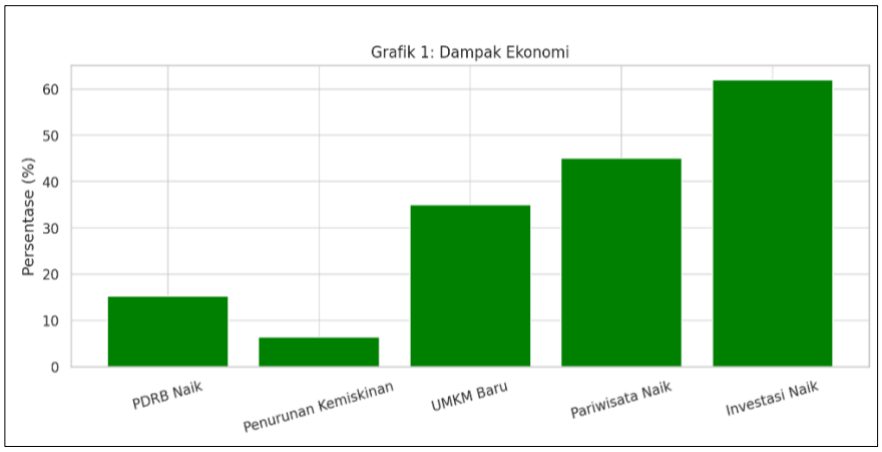


Figure 1. Economic Growth graph.

2) Accessibility Improvements

a) Travel Time, Average travel time to the district center decreased from 3 hours to 1 hour 15 minutes. Access to the nearest health facility decreased from an average of 45 minutes to 20 minutes.

b) Population Mobility, The frequency of residents traveling outside the sub-district increased by 125% for economic purposes and 80% for social purposes. The use of motorized vehicles increased by 55%, with an increase in motorcycle ownership of 40%.

3) Access to Education

a) The school participation rate for secondary education increased from 65% to 82%. The number of students continuing on to higher education increased by 30%.

b) Public services consisting of electricity coverage increased from 70% to 95% of households. Access to clean water increased from 55% to 80% of households.

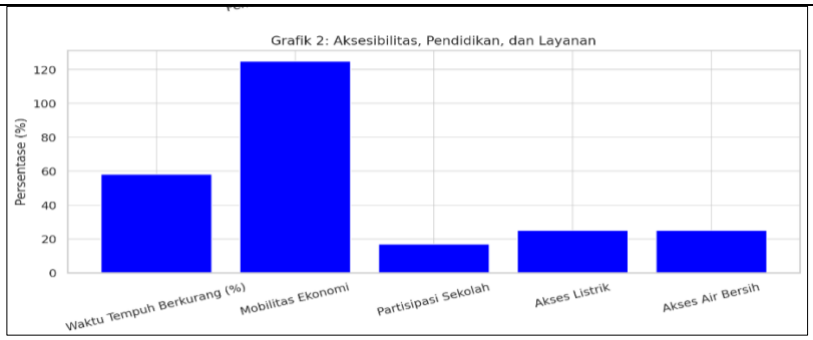


Figure 2. Accessibility and Education services graph.

4). Socio-Cultural Impact

a) Lifestyle Changes. 65% of respondents reported increased access to information and technology. Smartphone adoption increased from 30% to 75% of the adult population.
b) Social Interaction, Frequency of inter-village meetings increased by 90% for customary activities and 120% for economic activities. 70% of respondents reported an increased sense of connectedness with the outside community.
c) Changes in Occupational Structure. The proportion of the population working in the agricultural sector decreased from 75% to 60%. A 25% increase in the number of people working in the services and trade sectors.

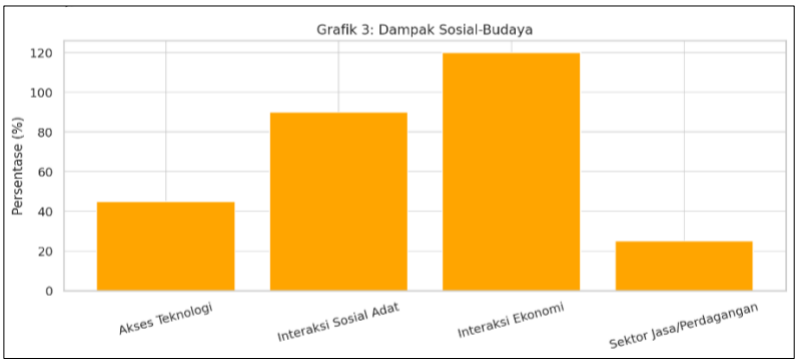


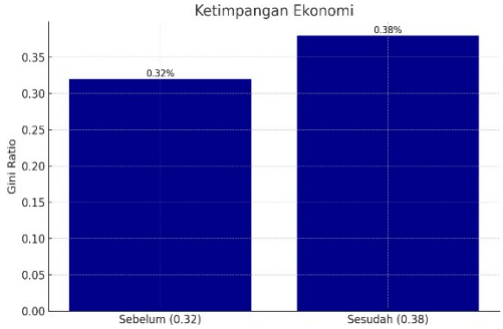
Figure 2. Socio-Cultural Impact graph.

2. Challenges and Impacts of Road Development on Economic Growth

Research also shows that there are challenges and negative impacts as follows:

1. Economic Inequality

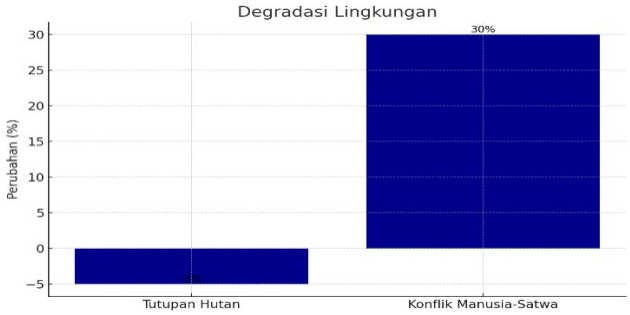
Road construction in Lahomi District has brought various benefits, but has also led to an increase in economic inequality as seen from the Gini Ratio analysis, which shows an increase from 0.32 to 0.38. This indicates that although the regional economy as a whole has progressed, the distribution of development benefits has not been equal. In particular, 20% of households located far from the main road reported a relative decline in access to economic opportunities such as trade and employment. This inequality reflects the need for more inclusive development planning to ensure that all levels of society receive balanced benefits.



2. Environmental Degradation

Road infrastructure development also has negative impacts on the environment. Data shows a 5% decrease in forest cover in the five years following road construction, worsening ecosystem degradation. In addition, there was a 30% increase in reports of human-wildlife conflicts, indicating a direct impact of development on wildlife habitats.

To address these challenges, sustainable development approaches are needed, such as reforestation efforts and effective management of human-wildlife conflicts.

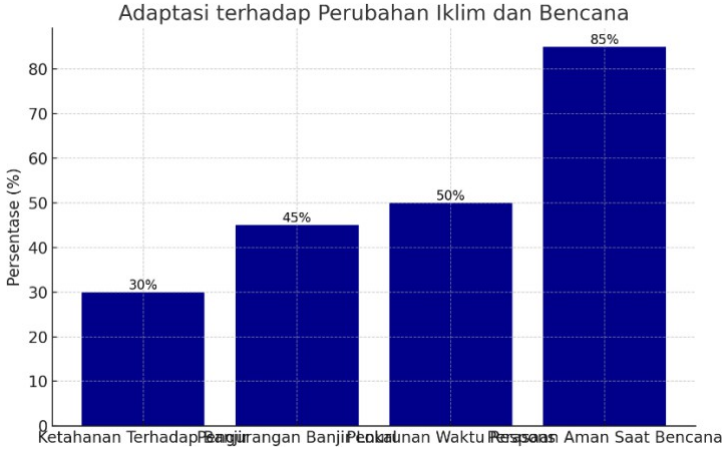


3. Social Change

Road construction has brought significant changes to the social patterns of the community. As many as 40% of respondents expressed concerns about the erosion of traditional values, resulting from increased openness to outside influences. In addition, reports of juvenile delinquency cases increased by 15%, indicating new challenges in maintaining social stability and local cultural values. To overcome this, educational and public awareness programs are needed to maintain a balance between modernization and cultural preservation.

4. Adaptation to Climate Change and Disasters

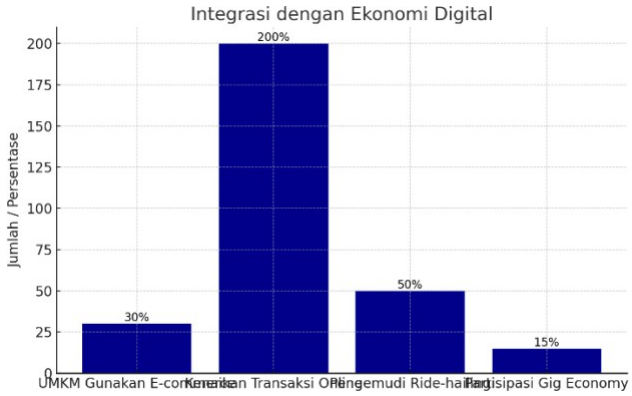
Road construction in Lahomi District has increased the resilience of infrastructure to the impacts of climate change and disasters. The new road has proven to be 30% more resistant to flooding compared to the old infrastructure, thanks to better planning and construction of the drainage system. This system has also reduced local flooding by 45%. In addition, response times for disaster relief have decreased by 50%, allowing for faster and more efficient access to assistance. As many as 85% of residents reported feeling safer in terms of evacuation during a disaster, demonstrating the positive impact of infrastructure on community preparedness.



5. Integration with the Digital Economy

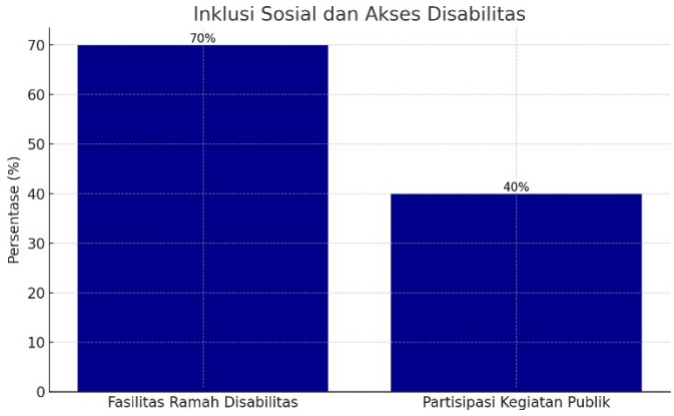
The new road has accelerated the integration of Lahomi District into the digital economy, creating new opportunities for the community. As many as 30% of MSMEs have now adopted e-commerce platforms in the past

two years, with online transaction volumes increasing by 200% year-on-year since the road was built. In addition, the emergence of 50 ride-hailing drivers in the past year shows a shift towards an app-based economy or gig economy. As many as 15% of the working-age population reported participating in app-based jobs, reflecting significant economic transformation and societal adaptation to digital technology.



6. Social Inclusion with Accessibility for Persons with Disabilities

Road construction has contributed to increasing social inclusion, especially for people with disabilities. As many as 70% of new public facilities along the road have been equipped with disability-friendly access, reflecting an increased awareness of the need for inclusivity in infrastructure planning. In addition, participation of people with disabilities in public activities increased by 40%, indicating the positive impact of development on equality and empowerment of vulnerable groups. These efforts show that infrastructure development does not only focus on economic aspects, but also pays attention to the social needs of the community.



5. CONCLUSION

1) Economic Growth and Accessibility: Road construction has become a major driver of economic growth. This is indicated by an increase in GRDP of 15.3%, a decrease in the poverty rate from 28.5% to 22.1%, and a growth of UMKM of 35% in three years. In addition, accessibility has increased drastically, with travel time to the city center reduced from 3 hours to 1 hour 15 minutes, thus facilitating community mobility and increasing access to education and health services. Digital integration and sustainable development, The roads built facilitate the adoption of the digital economy by 30% of UMKM, accelerating the integration of Lahomi District into global trends. In addition, this development has increased disaster resilience and opened up opportunities to implement the smart city concept, including digital infrastructure and intelligent transportation systems.
2) Challenges of Socio-Cultural Transformation: Road construction brings significant changes to social interaction patterns, access to information, and community employment structures. However, challenges such as increasing economic inequality (Gini Ratio increased from 0.32 to 0.38) and environmental impacts in the form of decreasing forest cover require a more inclusive and sustainable development strategy to maintain social and ecological balance. Road construction in Lahomi District has had a broad positive impact, but also presents challenges that need to be managed wisely. A holistic approach that considers economic, social, environmental, and technological aspects is needed to ensure sustainable benefits for the community. These findings are relevant as a guide for infrastructure development in other remote areas in Indonesia.

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