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Rural Road Development: A Satisfaction Analysis as a Catalyst for Economic Improvement

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Abstract

This study evaluates the impact of rural road infrastructure development on economic progress and community satisfaction, specifically examining a project in Gua Musang that encompasses 14 villages and roads spanning a total length of 9.57 kilometres. The study utilized a quantitative research methodology, gathering data from 425 respondents using surveys and secondary sources. The findings demonstrate substantial income improvements, particularly with a notable rise in the number of those earning more than RM1,000. Improved accessibility resulted in increased market entry, lower transportation expenses, and better economic prospects. The satisfaction analysis revealed significant levels of endorsement for road safety, construction functioning, and utility availability. Most respondents believed that the roads enhanced daily activities, safety, and connectedness. Despite several difficulties with road maintenance, the overall level of satisfaction remained high. The development also had a favourable effect on agricultural activities, as respondents reported enhanced utilization of machinery, higher sales, faster market access, and improved entrepreneurial productivity. The Rural Road Development Project in Gua Musang effectively achieved its objectives, demonstrating that enhanced road connectivity may dramatically uplift rural economies and quality of life. These findings emphasize the vital importance of making specific investments in rural road infrastructure to stimulate economic growth and improve the well-being of communities.

Keywords: Rural Community, Rural Road Development, Economic Development, Infrastructure Development, Community Satisfaction

Introduction

The development of rural road infrastructure plays a pivotal role in shaping rural areas' economic landscape by significantly improving connectivity and economic opportunities. Often, these regions face substantial challenges due to inadequate road networks, which can limit economic prospects and negatively affect residents' quality of life. Roads are essential for linking rural communities to broader markets, essential services, and employment opportunities. By improving road infrastructure, rural areas can achieve better access to healthcare, education, and various economic activities. This, in turn, drives regional development and enhances overall well-being.

Studying the development of rural roads is crucial because it directly impacts the economic viability of these regions, and assessing the utility and effectiveness of infrastructure projects can provide actionable insights for policymakers, governments, and development agencies. By focusing on this area, researchers can identify key areas where investments in road networks yield the highest socio-economic returns, thereby guiding better policy decisions and resource allocation.

Furthermore, Lestari et al (2024), emphasize the importance of sustainability in rural road projects. Their study, conducted in Woro Village, Bojonegoro Region, evaluates the environmental, social, economic, institutional, and legal dimensions of road development. Besides, it demonstrates that incorporating sustainability into road projects has a positive impact on these dimensions, with strong performances across various sustainability indices. This underscores the critical need for strategic investments in rural road infrastructure that not only drive economic growth but also ensure sustainable development and improved quality of life in rural communities. Through detailed data collection and analysis, this research provides valuable insights for policymakers and stakeholders, highlighting the benefits of integrating sustainability into infrastructure planning to promote long-term, inclusive growth.

Therefore, this study focuses on evaluating the effects of rural road development through satisfaction analysis, aiming to understand how enhancements in road infrastructure contribute to economic advancement. By analyzing residents' satisfaction levels before and after road development projects, the research seeks to uncover both the direct and indirect benefits of improved road systems. Satisfaction analysis is a critical tool for assessing how infrastructure improvements translate into tangible economic benefits and better living conditions. For example, the Rural Road Development Project in the Gua Musang area involves 14 villages and 14 roads with a total accumulated length of 9.57 kilometres and a total budget allocation of RM1.4 million. This project exemplifies how targeted investments in road infrastructure can support local economic activities, reduce isolation, and foster community development.

This study is particularly beneficial for rural development planners, local governments, and non-governmental organizations (NGOs) that aim to uplift rural communities. Furthermore, understanding how improved connectivity drives regional economic development can also inform broader national development strategies, particularly in countries where rural areas account for a significant portion of the population. Thus, the study of rural road development

is essential not only for advancing infrastructure but also for promoting equitable economic growth and enhancing the overall quality of life for rural populations.

Developing Rural Road To Support Community Satisfaction And Economic Improvement

Kanwal et al (2020), discovered that the perceived impact of road and transportation infrastructure development has a favorable influence on local community support for tourism, which is mediated by perceived environmental impact, tourism advantages, and community satisfaction. Furthermore, extending rural road networks boosts agricultural output, encourages the use of new technology, and promotes crop specialization (Gebresilasse, 2023). Improved roads also help to drive local economic development by producing new jobs and raising labor income (Gertler et al., 2024). Thus, further discussion of the relation of rural road development to economic growth and community satisfaction is in the next subsection.

An Overview of Rural Road Development

Rural road development plays a crucial role in enhancing connectivity and economic opportunities in rural areas. Lestari et al (2024), highlight the significance of sustainability in rural road projects by evaluating environmental, social, economic, institutional, and legal dimensions in Woro Village, Bojonegoro Region. The study demonstrates that such development has a positive impact on these dimensions, with sustainability indices showing strong performance across various aspects. Similarly, Kebede (2024), focuses on the welfare effects of rural roads in Ethiopia, revealing that road expansion has led to a 13% increase in real agricultural income due to improved market access and crop price increases. This finding underscores the importance of rural roads in facilitating market integration and enhancing agricultural productivity.

However, challenges remain in implementing rural road infrastructure effectively. Pillay (2023), notes that despite efforts to improve road networks in South Africa, issues like inadequate transportation and financial constraints continue to hinder rural development. The study suggests that public-private partnerships could play a vital role in overcoming these obstacles. In Malaysia, Mustafa et al (2020), discusses how green practices in rural road development not only support socio-economic improvements but also address environmental concerns. The integration of green practices is proposed to balance social, economic, and environmental benefits, thus contributing to sustainable rural development.

Economic Impact of Infrastructure on Rural Areas

Timilsina et al (2024), analyzed the economic impact of infrastructure, specifically transport, electricity, and telecommunications, on growth in domestic products (GDP) using data from 87 countries between 1992 and 2017. Their study reveals that investments in infrastructure, particularly in electricity generation and telecommunications, have significant long-term positive effects on GDP, especially in developing economies. However, the short-term effects of such investments can be less favorable, with roads and railways sometimes showing negative impacts. This highlights that while infrastructure improvements can drive substantial economic growth over time, the immediate benefits can vary, underscoring the need for strategic planning to align infrastructure investments with the specific economic needs of different regions.

Zhu et al (2024), explores the economic impact of tourism on rural revitalization in the Silk Road Economic Belt from 2011 to 2020. Their study finds that while rural revitalization has increased significantly by 86%, the growth in high-quality tourism has been variable. The coupling coordination degree, which measures the alignment between tourism development and rural revitalization, is higher in the southwest compared to the northwest. This variation is influenced by factors such as public fiscal expenditure and per capita GDP, highlighting the importance of effective coordination between tourism and rural development strategies to optimize economic benefits across regions. Similarly, Nseobot et al (2023), examines the impact of rural road networks on economic development in Nigerian local government areas (LGAs). Their mixed-methods research shows that well-developed rural roads enhance agricultural productivity, market access, job creation, and poverty reduction. However, challenges such as inadequate maintenance and governance issues limit the effectiveness of these roads, emphasizing the need to address these barriers to fully realize the economic benefits of rural road infrastructure. Additionally, Baral (2023), focuses on the Kaski district in Nepal, emphasizing that improved rural roads are crucial for sustainable socio-economic development. The study advocates for prioritizing road upgrades based on cost-benefit analysis to enhance accessibility and productivity, positively impacting various sectors such as education, health, and agriculture in rural communities.

Previous Studies on Community Satisfaction and Economic Improvement

Rural road development is essential for enhancing community satisfaction and catalyzing economic improvement. Research consistently underscores the multifaceted impact of well-maintained rural roads on local economies and residents' well-being. Mwangi et al (2024), highlight the significant role of rural road maintenance in improving household well-being in Kericho County, Kenya, showing that well-maintained roads greatly enhance accessibility and overall community satisfaction. Improved accessibility facilitates economic activities by reducing travel time and transportation costs, boosting local economies, and improving residents' quality of life. This study underscores the importance of regular road maintenance and the need for local governments to allocate sufficient resources for infrastructure development to sustain these benefits.

In a broader context, Fakfare et al (2021), provide valuable insights into how infrastructure improvements influence economic and cultural factors. Their research, while focused on community markets, reveals principles applicable to rural road development. They found that economic and cultural factors, as well as residents' attitudes toward development, have a significant impact on community well-being. Improved infrastructure, such as roads, not only facilitates economic activities but also enhances social cohesion and cultural exchange by making community resources more accessible. Martí et al (2023), further contribute to this discussion by examining demand-responsive transport (DRT) systems, emphasizing the need for reliable infrastructure to support such innovations. Their research highlights the necessity for user-centred design and technological advancements in transport systems, which rely on reliable rural road networks. These diverse perspectives collectively demonstrate how rural road development significantly improves community satisfaction and drives economic growth, reinforcing the interconnectedness of economic, cultural, and social well-being in rural communities.

Methodology

This study employs a quantitative research methodology to assess community satisfaction with rural road development and its economic impact on the local population. Data collection involved both primary and secondary sources. Primary data was gathered through a structured survey distributed to a sample of 425 respondents, chosen from a total population of 2,400 across 14 villages. This sample random sampling is considered approved as it is based on Krejcie and Morgan's (Krejcie & Morgan, 1970) sample size determination table. This sample size was determined to ensure the representativeness and reliability of the findings. Secondary data was sourced from the KESEDAR Annual Report and Project Performance Report to complement the primary data and provide a comprehensive analysis. The survey instrument included detailed questions designed to measure satisfaction levels and the economic effects of road development. Data analysis was conducted using quantitative methods, facilitating a systematic examination of the collected data. The research was carried out over four months, ensuring thorough data collection and analysis.

Results and Findings

Demographic Analysis

The demographic analysis of a survey conducted among 425 respondents from a population of 2,400 across 14 villages reveals key insights into gender distribution, age, employment, marital status, educational levels, residency period, and household size. The survey shows a significant gender imbalance, with 62.59% male and 37.41% female respondents, suggesting higher male participation and possibly reflecting community gender dynamics. Age-wise, majority of respondents (30.12%) are aged 51 and over, followed by 28% aged 41–50, highlighting an older demographic that may influence perspectives on infrastructure impacts.

Employment data indicates a diverse occupational landscape, with 49.4% in unspecified jobs, 21.9% gardeners, and smaller percentages in roles like students, entrepreneurs, and intermediaries. Marital status is predominantly married (64.5%), which affects economic activity and infrastructure satisfaction. Educationally, 50.1% have secondary education, while 13.6% have no formal schooling, pointing to a generally low education level. Residency in Gua Musang is long-term for most, with 76.2% residing over ten years, indicating stable, deeply rooted communities. Household sizes vary, with 48.7% having four to six members, reflecting typical rural family structures. These findings highlight the demographic and socio-economic characteristics influencing community satisfaction with rural road development projects.

Increase in Population Income

The goal is to achieve a 10% increase in income among the targeted population. The distributed questionnaire includes questions about residents' income before and after the completion of the road project. Since the project was completed in 2019, we will compare the income data from before 2019 with the income data from 2020.

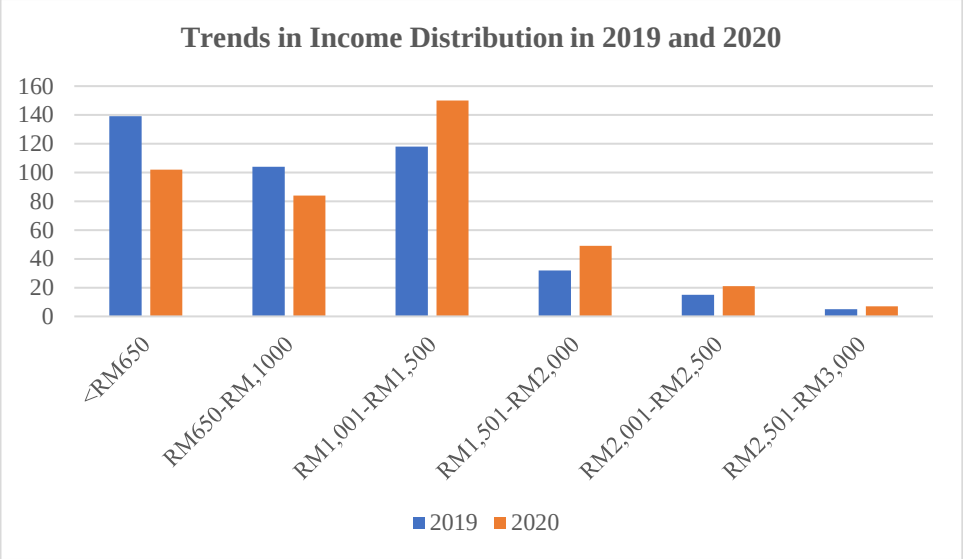

Figure 1: Household Income Distribution Comparison in Year 2019 and 2020

Figure 1 above illustrates changes in income segments. The <RM650 segment decreased by 8.71%, dropping from 32.71% to 24%. Conversely, the RM650-RM1,000 segment saw an increase of 4.71%, rising from 19.76% to 24.47%. Additionally, the RM1,000-RM1,500 segment grew by 7.53%, increasing from 27.7% to 35.29%.

The following figure illustrates how rural inhabitants' income groups changed between 2019 and 2020. The data indicate a significant improvement in income distribution among rural inhabitants, with a notable rise of 13.41% in the proportion of individuals earning more than RM 1,000 from 2019 to 2020. The transition indicates a positive economic change, most likely due to road construction. This has improved the ability to reach diverse areas, lowered expenses, and created new economic prospects for rural populations.

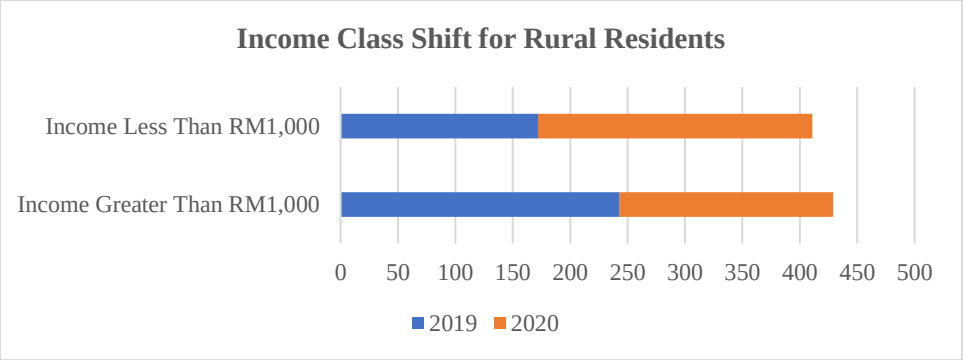

Figure 2: Income Class Shifts for Rural Residents After Road Development

The observed trends suggest that road development has likely contributed to improved income levels for rural residents. For example, enhanced accessibility via improved roads makes it easier for rural residents to access markets, sell their products, and procure necessary goods and services. Next, better road infrastructure can reduce transportation costs, allowing more efficient movement of goods and people, leading to better profitability for rural businesses and farmers. Finally, better access to services contributes to overall economic well-being and enables residents to pursue higher-paying opportunities.

Rural Road User Satisfaction

The second outcome target focuses on the satisfaction of rural road users across five identified aspects: safety, road construction functionality, road maintenance, utility overflow, and basic facilities, as well as reducing vehicle damage. A questionnaire was used to gather feedback on satisfaction with rural roads. The user satisfaction survey is measured using a Likert scale from Strongly Disagree (1) to Strongly Agree (5). Thus, Table 1 below shows the mean value for every aspect of user satisfaction.

Table 1
Summary of the Mean Values for Different Aspects of Road User Satisfaction.

Village Transportation Road User Satisfaction	Mean Value
The road is safe to use.	**4.00**
The built road facilitates daily affairs and connects nearby villages and other areas.	**4.14**
The roads are well maintained.	**3.87**
Adding basic facilities and utilities.	**4.06**
Reduce vehicle damage.	**3.97**

The safety of the constructed roads was the first aspect assessed, with 88% of respondents indicating agreement or strong agreement. The road construction adhered to the specifications set by the Malaysia Public Work Department (JKR) KESEDAR, and safety elements were implemented to ensure the safety and comfort of road users. With a mean satisfaction rating of 4.00, most users feel secure when travelling on these roads, though there may still be room for improvement. Additionally, 94.6% of respondents agreed or strongly agreed that the roads effectively support daily activities and provide excellent connectivity between villages and towns, with the highest mean value of 4.14. This highlights the importance and effectiveness of the road network in enhancing mobility and accessibility, meeting the project's primary goal.

Road maintenance was another aspect of satisfaction measured, with 80.7% of participants agreeing or strongly agreeing that well-maintained roads contribute to their satisfaction. However, challenges like natural disasters and budget constraints can hinder effective maintenance, reflected in a slightly lower mean value of 3.87. Additionally, 91.5% of respondents were satisfied with the road's spillover effect, especially in providing and availability of utilities and basic facilities, with a mean satisfaction of 4.06, showing that amenities like lighting, signage, and gutter enhance the overall usability of the roads. Lastly, 87.8% of respondents agreed that rural roads reduce vehicle damage, with a mean rating of 3.97, suggesting the roads are generally effective at preventing vehicle damage, though there is room for improvement. Overall, the data suggests that while users are generally satisfied with the roads, there are areas such as maintenance and vehicle damage prevention that could benefit from further enhancement.

Impact on Agricultural Activities

The third outcome target was the impact on agricultural activities, which includes five main aspects: facilitating machinery use, increasing agricultural sales, speeding up the marketing of agricultural products, easing access for traders and middlemen, and boosting entrepreneurial output. A survey was conducted to gather feedback on these aspects by using

a Likert scale from Strongly Disagree (1) to Strongly Agree (5). Thus, Table 2 below shows the mean value for increased agricultural production due to road development.

Table 2
Summary of the Mean Values for Increased Agricultural Production

Increased Agricultural Production	Mean Value
Facilitating the use of machinery to transport agricultural products.	**4.03**
Agricultural product sales increased.	**3.99**
Agricultural products are fast to market.	**4.05**
Facilitate the entry and exit of traders/retailers/middlemen.	**4.05**
The output of agricultural entrepreneurs increased.	**3.97**

The findings indicate that respondents overwhelmingly believe road construction significantly improves various aspects of agricultural production. A majority (87.3%) agreed or strongly agreed that village road construction facilitates the use of machinery and the transportation of agricultural products. Additionally, 83.1% felt that improved roads boost the sale of agricultural products by enhancing productivity and marketability. The quick marketing of goods was supported by 86.6% of respondents, who stated that road construction accelerates the process of bringing products to market. Moreover, 88.2% agreed that rural roads make it easier for traders, hawkers, and middlemen to access agricultural products. Finally, 83.6% of respondents believed that their agricultural output has increased due to enhanced accessibility and mobility provided by rural roads.

The mean Likert scale values reflect general satisfaction and a positive outlook on various aspects of increased agricultural production. The highest average scores are observed for the statements related to market speed and facilitation of traders, both scoring 4.05, highlighting effective market and logistical improvements. The lowest score, though still high at 3.97, concerns agricultural entrepreneurs' output, suggesting room for further growth and support in this area. Overall, the data reflects significant progress in agricultural production efficiency and market dynamics.

Conclusion

The rural road development in Gua Musang has significantly enhanced community satisfaction and economic income. The survey findings indicate a monthly increase in household income above RM1000 by 13.41%, highlighting the positive economic impact of improved road infrastructure. This increase in income is attributed to better access to markets, reduced transportation costs, and more efficient movement of goods and services. The agricultural sector has particularly benefited, with machinery usage, sales output, and market acceleration all exceeding their respective targets by notable margins. These improvements underscore how better road connectivity can drive economic growth by facilitating agricultural productivity and market access.

Community satisfaction has also seen remarkable improvements due to the road development project. Safety satisfaction levels exceeded the target by 8.1%, while satisfaction with road usage functions surpassed the target by 14.6%. These findings suggest that residents feel safer and find the roads more functional and beneficial in their daily lives. Maintenance satisfaction levels were also above target, indicating community appreciation

for the new infrastructure's upkeep and sustainability. Additionally, the availability of utilities and basic facilities has greatly improved, with satisfaction levels exceeding the target by 11.5%. These enhancements contribute to a higher quality of life for the residents, as they now have better access to essential services and amenities. Thus, the Village Connection Road Project in Gua Musang has effectively achieved its primary objectives, providing perfect, comfortable, and secure road infrastructure that connects 14 villages. The success of this project is reflected in the high levels of satisfaction among villagers and road users, as well as the significant economic benefits realized. Overall, the project has not only met but exceeded its targets, demonstrating the crucial role of infrastructure development in improving community well-being and economic prosperity in rural areas.

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References

Baral, P. (2023). A Review on Rural Road Improvement and Its Impact on Socioeconomic Development of Kaski District. *Journal of Advanced Academic Research*, *10*(1), 10–18.

Fakfare, P., & Wattanacharoensil, W. (2021). Impacts of community market development on the residents' well-being and satisfaction. *Tourism Review*, *76*(5), 1123–1140.

Gebresilasse, M. (2023). Rural roads, agricultural extension, and productivity. *Journal of Development Economics*, *162*, 103048.

Gertler, P. J., Gonzalez-Navarro, M., Gračner, T., & Rothenberg, A. D. (2024). Road maintenance and local economic development: Evidence from Indonesia's highways. *Journal of Urban Economics*, *143*, 103687.

Kanwal, S., Rasheed, M. I., Pitafi, A. H., Pitafi, A., & Ren, M. (2020). Road and transport infrastructure development and community support for tourism: The role of perceived benefits, and community satisfaction. *Tourism Management*, *77*, 104014.

Kebede, H. A. (2024). Gains from market integration: Welfare effects of new rural roads in Ethiopia. *Journal of Development Economics*, *168*, 103252.

Krejcie, R. V, & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, *30*(3), 607–610.

Lestari, P., Rachmansyah, A., Efani, A., & Pertiwi, M. (2024). Sustainability of Rural Road Development: A Case Study on Woro Village Kepohbaru District Bojonegoro Region. *Indonesian Journal of Social and Environmental Issues (IJSEI)*, *5*(1), 31–41.

Martí, P., Jordán, J., González Arrieta, M. A., & Julian, V. (2023). A Survey on Demand-Responsive Transportation for Rural and Interurban Mobility. *International Journal of Interactive Multimedia and Artificial Intelligence*, *8*(3), 43–54.

Mustafa, N. A., Munikanan, V., Zakaria, R., & Aminudin, E. (2020). A Review on Rural Roads in Malaysia: Green Practice Towards Socio-Economics. *International Journal of Modern Social Sciences*, *1*(1), 12–16. https://www.researchgate.net/publication/349311574

Mwangi, M. B., Omboto, P., & Kungu, D. (2024). Rural Roads Maintenance and Households' Wellbeing. *East African Journal of Business and Economics*, *7*(1), 313–321.

Nseobot, I. R., Bassey, C., & Kanwal, N. D. S. (2023). Assessment of Rural Road Network on Economic Development of Local Government Areas in Nigeria. *International Journal of Organizational Business Excellence*, *6*(1), 1–18.

Pillay, R. M. (2023). The Impact of Road Infrastructure on Rural Development in South Africa. *International Journal of Social Science Research and Review*, *6*(7), 566–574.

Timilsina, G., Stern, D. I., & Das, D. K. (2024). Physical infrastructure and economic growth. *Applied Economics*, *56*(18), 2142–2157.

Zhu, H., Tang, J., Xie, X., Ding, Z., & Gong, L. (2024). A Coordination Analysis on Rural Revitalization and Tourism High-Quality Development along the Silk Road Economic Belt, China. *Land*, *13*(8), 1173.