

Sociological Analysis of Pekanbaru-Kampar Agglomeration's Response to Infrastructure Development: A Structural and Functional Analysis

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ABSTRACT

This study aims to examine and comprehend the structural and functional responses of the community in Tambang District, Kampar Regency, to the construction of the Trans-Sumatra Toll Road interchange. This large-scale infrastructure development has triggered the inevitable phenomenon of urban agglomeration, changing the physical and socio-economic landscape of the region. This study uses a descriptive-analytical qualitative approach with a single case study design. Data was collected through in-depth interviews, observation, and documentation, and analyzed using an interactive model. Tambang Subdistrict evolved into a strategic hub characterized by substantial alterations in spatial planning, land utilization, and the reconfiguration of ownership. Functionally, mobility drastically improved, but the economic impacts on Micro, Small, and Medium Enterprises (MSMEs) were profoundly varying. The findings reveal an economic dichotomy: MSMEs, like Dapur Aru, experienced increased turnover due to expanded accessibility, while traditional MSMEs, like Lopek Bugi, faced a decline due to disruption in traditional access patterns. These results support the Growth Pole Theory but offer a nuanced contribution by showing how the developmental effects are uneven at the micro-community level, aligning with Structural Functionalism. The conclusion underscores the urgency of more targeted and adaptive MSME mitigation and empowerment policies to ensure local socio-economic sustainability amid development.

1. INTRODUCTION

Pekanbaru is the largest city and the capital of Riau province. In 2024, the population reached 1.14 million people (Agus Dwi Darmawan, 2025). As the city grows, Pekanbaru is showing very rapid growth, transforming from a major city to a megapolitan city in the last ten years. Pekanbaru ranks fourth on the island of Sumatra, after Medan, Batam, Palembang, and Bandar Lampung (Ahmad TN, 2025).

The city's location and economy are very strategic, being in the middle of Sumatra Island, making it an important center on the island and a gateway for trade to Asian, American, and European markets from western Indonesia (Riau Pos, 2022). It also borders Malaysia directly, separated only by the Malacca Strait. The crossing is not too far, and there are many speedboats available to get there. This important role is supported by the abundance of natural resources and

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plantations in the surrounding area, making Pekanbaru a significant investment and business attraction center, in line with the government's vision to make it an economic growth center in Indonesia (Annisa et al., 2024).

However, the growth of Pekanbaru City is not only disruptive as a city center, but also triggers a stronger urban agglomeration phenomenon. This encouraged the expansion of the city area to the surrounding suburban environment. This suburban area, referred to in urban sociological studies as a sub-urban area, is currently undergoing a change in function and value, from initially being not very desirable to becoming a productive and even elite area (Yeneneh et al., 2024). The city's condition is supported by the high rate of migration or urbanization on the island of Sumatra, which causes administrative overlap with its surrounding areas, namely Kampar, Siak, and Pelalawan Regencies.

To address the congestion in Pekanbaru City, the "Pekansikawan" program (an acronym for Pekanbaru, Siak, Kampar, and Pelalawan) was created as a strategic collaboration with neighboring districts to integrate infrastructure development such as roads, bridges, housing, and transportation (Pekanbaru.go.id, 2020).

Figure 1. Tol Trans Sumatera



Source : (Lamanriau.com, 2022)

Indonesia's regional growth has been significantly influenced by Riau Province's substantial infrastructure development, especially the Trans-Sumatera Toll Road (Jatayu et al., 2024); (Nawir et al.,

2023). The Permai Toll Road, which connects Pekanbaru and Dumai in Riau Province, was constructed a few years ago. Improving mobility, accessibility, and connection is generally the major objective since it is anticipated to increase economic growth and the welfare of its citizens (Allya Salsa Bilatul Kh et al., 2024). As part of the Trans-Sumatera highway, a toll road is now being constructed from Pekanbaru to Padang. From there, it will be expanded to Rengat City, Indragiri Hulu Regency, and Riau. An essential component of the Trans-Sumatera toll road, which connects the Pekanbaru-Padang and Pekanbaru-Bangkinang sections, is this toll road.

Figure 2. Pekanbaru-Padang Toll Road is 255



km long, divided into 5 sections.

Source : (Rindra, 2019)

The acceleration of regional development in Riau is dominated by large infrastructure projects, especially the Trans-Sumatera Toll Road (Jatayu et al., 2024; Nawir et al., 2023). A vital component is the construction of the 255-km Pekanbaru-Padang Toll Road, divided into five sections. This development, particularly the interchange located in Tambang District, Kampar Regency, which is geographically situated on the outskirts of Pekanbaru, has accelerated the process of accumulation and interaction in the region. Such large-scale infrastructure construction not only creates physical changes but also drives fundamental shifts in social dynamics and local perspectives (Hamidah, 2023; Adila & Saraswati, 2022). Therefore, the response of the affected communities to these profound spatial changes, especially in Tambang, becomes the critical focus of this research.

Previous studies have extensively examined the impact of infrastructure development on cities and their surrounding areas. Most existing studies tend to focus on macroeconomic dimensions (Annisa et al., 2024) and physical modifications like land use (Daliman et al., 2023), or merely assess general public acceptance/rejection (Kartika Kirana et al., 2025).

The limitation of this body of work lies in its generally top-down approach and the evaluation of quantitative indicators that do not fully capture the dynamics of social and functional change at the local community level. For instance, studies on the impact of toll roads often fail to detail the complex social adaptation processes highlighted by Hamidah (2023) or Boedi Orbawati et al. (2021).

Consequently, there is a scarcity of urban and development sociology studies that apply comprehensive theories to specific peri-urban cases in Indonesia experiencing massive infrastructure pressure. Infrastructure can be viewed as a new "social fact" (Kusumastuti, 2016) that demands both structural and functional adjustments from society. While *Growth Pole Theory* (Perroux, Slyvka, 2025) is frequently used to explain regional growth, its application to understanding functional resistance and adaptive responses at the micro-community level, particularly in "losing" buffer zones (like Kampar compared to Pekanbaru), remains limited (Panjaitan et al., 2020). This study aims to close this gap by integrating the perspectives of Structural Functionalism (Durkheim and Parsons) and Growth Pole Theory to analyze in detail *two types* of adaptive response—structural and functional—within the Tambang community.

By focusing on an in-depth analysis of structural responses (changes in livelihood, land ownership, social organization) and functional responses (changes in cultural values, social interaction, and daily spatial usage) in Tambang District, this research aims to provide a comprehensive understanding of modernization and agglomeration from the perspective of the affected communities. Scientifically, this study is expected to advance urban and development sociology theory through the applied testing of these concepts in the specific context of peri-urban Riau. Practically, the findings can serve as a foundation for infrastructure development policies that are more sensitive to local social and cultural circumstances.

Based on the background and research gap described above, the main research questions to be answered are:

1. How do structural changes (land ownership, livelihoods, and social organization) occur and what are the responses from the community in Tambang District, Kampar Regency, as a direct consequence of the Trans-Sumatera Toll Road interchange construction?
2. How do functional changes (patterns of social interaction, cultural values, and adaptation of daily spatial usage) occur and what are the responses from the community in Tambang District, Kampar Regency, following the construction of the Trans-Sumatera Toll Road interchange?

2. METHODS

This study utilizes a qualitative methodology with a descriptive-analytical framework to comprehensively examine the responses of the Pekanbaru urban agglomeration in the Kampar Regency area, focusing on the community's structural and functional reactions to the construction of the Trans-Sumatera Toll Road interchange. A qualitative technique was selected as it enables researchers to comprehensively investigate social phenomena, extract meaning from subjective experiences, and comprehend societal perceptions and experiences of change within its natural setting (Amtai Alaslan et.al, 2023).

The descriptive-analytical technique seeks to systematically and accurately delineate symptoms, events, and occurrences, followed by an analysis to identify pertinent patterns and linkages (Nikmah, 2023). The study took place in Tambang District, Kampar Regency, which is the key access point for building the Pekanbaru-Bangkinang portion of the Trans-Sumatera Toll Road. The research was conducted for a period of one month (October – November 2023), where the research team carried out repeated and alternating visits to the field to ensure prolonged engagement and comprehensive data collection, thereby strengthening the credibility of the findings. *This* location serves as a vital hub for infrastructure development, impacting local communities and economies. Consequently, understanding the implications of such projects is essential for fostering sustainable growth and addressing the needs of the residents.



Figure 3. Map of Tambang District, Kampar Regency

Source : (Anonim, 2022)

There are two main types of data sources in this study: primary data and secondary data. Primary data is collected directly from the field through direct interaction with the research subjects. This data contains information about how the public feels, thinks, and experiences the changes in structure and function that the construction of the toll road interchange has brought about. The core data centers on interviews conducted with the residents of Rimbo Panjang Village, a locality in Tambang District that is directly impacted. Secondary data was sourced from indirect channels, including official local government documents (spatial plans, development reports), scientific publications, news articles, prior research reports, and statistical data pertaining to regional and infrastructure development in Kampar Regency and Pekanbaru City.

Three main methods were used to acquire data: in-depth interviews, observation, and documentation. The research subjects were interviewed in person in-depth. This method enables researchers to acquire extensive data regarding the community's structural and functional responses. The instrument employed

was a semi-structured interview guide featuring a compilation of open-ended questions to facilitate the discussion, while also permitting the researcher to investigate issues that arose spontaneously (Booth et al., 2019). Researchers presume that the study participants possess the most comprehensive understanding of the topics under examination and that the information they provide is trustworthy and precise.

Observations are systematically executed to document phenomena occurring in the field, encompassing behavior, social interactions, and alterations in the physical environment. These observations may be participatory or non-participatory, contingent upon the situational environment, to obtain precise and authentic data regarding the actual conditions at the research location (Fadli, 2021). The tools that were employed were organized observation checklists and field notebooks. Technical documentation encompasses the compilation and examination of written materials, including regional rules, construction project reports, mass media releases, and data from official websites pertaining to toll road construction and urban agglomeration growth. The aim of this document analysis is to augment and validate the information acquired from interviews and observations.

The criteria for research subjects encompass a total of 15 informants selected through purposive sampling. This includes: village or district officials (such as village heads and secretaries), local community leaders (including religious and traditional leaders), micro, small, and medium enterprise (MSME) participants in Tambang District, and residents of Rimbo Panjang Village who are directly impacted by or possess comprehensive knowledge of the construction of the Trans-Sumatera Toll Road interchange and the associated agglomeration dynamics. The primary key informant for this study is the Regional Secretary of Kampar Regency, who provides crucial insight into regional planning and policy responses. Exclusion

criteria encompass individuals who are not directly pertinent to the phenomenon under investigation, do not inhabit or engage in economic activities within Tambang District, or lack sufficient knowledge of the research subject. The selection of informants focused on those with "power and authority" as well as in-depth knowledge to give useful and relevant information. The *verstehen* technique, also known as interpretive understanding (Patrick Gann, 2017), is used to figure out what acts signify, by deeply exploring the subjective meanings informants attach to structural and functional changes,

Analyzing the Data. We used an interactive model (Baniecki et al., 2024) to look at the data we got from interviews, observations, and documents. This model has three activity flows that are related and happen at the same time:

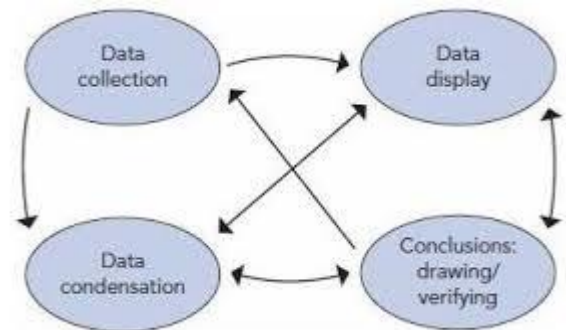


Figure 4. interactive model (Baniecki et al., 2024)

1) Data reduction, which comprises picking out, simplifying, abstracting, and changing raw data that comes from field notes. Researchers determined that selecting critical components, emphasizing significant information, and identifying themes and patterns pertinent to the research aims are imperative. 2) Presentation: The next step after reducing the data is to present it. Data that has been chosen and shown in the form of stories, matrices, graphs, or charts to help the researcher comprehend what is going on and figure out what to do next in the study. This way of showing data makes it easier to see how different pieces of data are related and to find the most important ones. 3) Data verification, this step is the process of coming to a conclusion and checking it. The first conclusions are

still early and will be updated as more strong evidence supporting the data is obtained. The verification process continues during and after data collection to make sure that the research results are accurate and private. This ongoing scrutiny is essential for

3. RESULT AND DISCUSSION

3.1 Research Results

This study analyzes the structural and functional responses of the community in Tambang District, Kampar Regency, to the construction of the Trans-Sumatera Toll Road interchange. Tambang District, with an area of approximately 489.91 km², is one of the strategic areas in Kampar Regency. Although it doesn't border the sea directly, 12 of its 17 villages are crossed by the Kampar River. Geographically, Tambang District is bordered by Tapung District to the north, Siak Hulu, Perhentian Raja, and Kampar Kiri Hilir Districts to the south, Kampar District to the west, and Tampan District of Pekanbaru City to the east.



Figure 5: Bangkinang Toll Gate
Source: Researcher Documentation 2024

3.1.2. Structural Changes in Society.

The phenomena of agglomeration, which is a byproduct of sustainable development, is unavoidable in this region. Infrastructure and housing development, economic expansion, and population migration are significant elements leading to agglomeration, which, while bringing benefits such as population density and economic growth, also offers issues including social inequality and resource pressure.

maintaining the integrity of the research. By ensuring that findings are consistently validated, researchers can build a more robust framework for understanding the implications of their data.

The construction of the Pekanbaru-Bangkinang toll bridge section is a real example of a substantial agglomeration phenomena, including key structural and functional investigations.

The development of the Trans-Sumatera Toll Road interchange in Tambang District has prompted important structural changes in society, including aspects of spatial planning, land usage, and local economic structure. Changes in Spatial Planning and Infrastructure: The presence of this flyover has significantly altered the spatial arrangement of Tambang District, making it a crucial "hydrological spatial movement link." This interchange acts as an important linking point, carrying vast volumes of people and goods between Pekanbaru and other major cities in Sumatra, including as Medan, Jambi, and Padang.



Figure 6. Aerial Photo of Pekanbaru-Bangkinang Toll Road

Source: (Ridwan, 2022)

This interchange position, which is adjacent to residential, leisure, and higher education hubs in Pekanbaru City, indicates the potential for a transition in land use function from agricultural to more urban-centric. Additionally, this interchange is immediately

connected to the Pekanbaru-Bangkinang highway, which is a national road, bolstering its status as a significant facility in the regional transportation system. Relevant parties regularly execute periodic maintenance and structural repairs to ensure the safety and quality of the toll road structure.

The process of developing the toll road and interchange requires a fairly considerable alteration of land use. The Regional Secretary of Kampar, Mr. Ir. Azwan, emphasized, "*The procedure of land acquisition carried out 'clearly' before building is governed through Riau Governor's Decree Number: Kpts. 1387/XII/2021. This ordinance mandates that any landowner selected as a construction site must acquire formal clearance from the Riau Governor to release or transfer their rights*" (Interview with the Regional Secretary of Kampar, September 25, 2023).

This reflects a fundamental shift in land ownership and use, from private land or customary woodlands to public areas for infrastructure. The costs incurred are charged to the State Revenue and Expenditure Budget. This approach also entails the conversion of agricultural land that was previously dominant in Tambang District.

Structurally, the local authority of Kampar Regency has responded to the impact of development on MSMEs by allocating space in rest areas for MSME actors who were previously placed on the access road. However, this approach has diverse implications on local MSMEs. Mrs. Sari Hidayah, owner of the MSME Dapur Aru, remarked that: "*The presence of the toll road has increased sales and expanded the reach of buyers from various regions.*" Conversely, Mr. Afriyanto, the Head of Palung Raya Village, said that the Lopek Bugi MSMEs in his village witnessed a large reduction in turnover due to changes in access patterns, despite the firm having created jobs. This shows a systemic restructuring in the distribution and market access for MSMEs.

3.1.3 Functional Changes in Society.

Observable functional changes include adaptations in social interaction patterns, economic practices, and the use of daily space in response to the opening of the toll road. The main function of a toll road is to improve connectivity and mobility efficiency. One Lopek Bugi seller in Kampar Regency stated that the travel time between Bangkinang and Pekanbaru was drastically reduced from approximately 40 minutes (or even 2 hours during traffic jams) to just 20 minutes by using the toll road. This functionally changes people's travel patterns and distributes goods, providing significant convenience and efficiency.

Positive Impacts: The construction of the toll road is recognized for its ability to improve the mobility of goods and services, increase accessibility to surrounding areas, boost revenue for strategic MSMEs (such as Dapur Aru), create new job opportunities for Bangkinang youth (both during the construction and operational phases of the toll road), and provide significant opportunities and benefits for property developers near the toll gates due to improved accessibility.

Negative Impact: Traditional MSMEs like the Lopek Bugi business in Palung Raya Village experienced a significant decrease in revenue due to changes in access patterns that disrupted the local economic cycle. To address this issue, the village government has made adaptive efforts by conducting outreach and training every six months at the village cooperative. This training focuses more on taste and packaging development, as well as motivating traders to persevere in their businesses and not give up. For this context, the Regional Secretary of Kampar Regency explained that: "*The road that is usually used will remain busy as usual, because people tend to use the toll road only on national holidays or when traffic is heavy due to cost considerations, while on regular days, traffic will still use the usual route, which is the national road access.*"

The findings revealed that the response of the Kampar community to the existence of the toll road interchange was generally positive, appreciating benefits such as reducing congestion, speeding up travel time, and improving transportation efficiency. This is also explained by the Regional Secretary of Kampar Regency, who stated that: "*The construction of the toll road will not cause significant losses to the community.*" It was added that society must also be aware and prepared to "be able to utilize" the existing opportunities, while the public's expectation of the government is that local governments need to pay attention to all MSMEs around the affected toll roads.

3.2 Discussion

The findings of this study directly address the purpose of assessing the structural and functional responses of the Kampar community to the construction of the Trans-Sumatera Toll Road intersection. Structurally, this growth has revolutionized the physical and socio-economic landscape of Tambang District, moving it from an agrarian domination to an area more intimately interwoven with the urban dynamics of Pekanbaru. Functionally, the toll road has altered travel patterns, causing varying economic repercussions and pushing various forms of social adaptation at the community and local government levels.

The scientific interpretation of structural changes reveals that exchange operates as a growth pole according to Perroux's (Ejebavwo & Ukustemuya, 2024) strong thinking, bringing economic activity and urbanization to the surrounding regions (Permana et al., 2023). The shift in land use from agriculture to infrastructure and the opportunity for property development surrounding the toll gate are a demonstration of the attractiveness of this growth pole. The land financing process governed by the government, as indicated by the Acting Regional Secretary of Kampar, shows a planned structural intervention to support development, but its impact at the local level can be disruptive (Nurlina, 2024).

Functionally, greater accessibility and travel time efficiency are essential characteristics of toll roads, which favorably influence people's mobility patterns (Allya Salsa Bilatul Kh et al., 2024).

The structural interpretation of these findings must be viewed through the lens of social stratification and resource allocation. The toll road, as a massive structural change, does not distribute benefits equally; rather, it reproduces social inequalities by favoring actors who possess higher economic capital (property developers) and social capital (MSMEs with established market access). This structural differentiation dictates the subsequent functional response. The government's policy, while necessary for infrastructure, constitutes a macro-level intervention that inevitably creates a new social fact, demanding immediate re-calibration from the local system (Kusumastuti, 2016).

However, the findings about the different impact on MSMEs suggest a more nuanced view. SMEs like Dapur Aru, who successfully used expanded accessibility to reach a wider market, demonstrate successful functional adaptability. Conversely, the Lopek Bugi MSMEs in Palung Raya Village, which suffered a reduction in turnover, imply a transitory dysfunction in the local economic system due to changes in access patterns. This coincides with the theory of structural functionalism, where new "social facts" (toll road building) demand functional modifications from diverse sectors of society (Kusumastuti, 2016; Ariyanto & Al Imran, 2023).

Using Parsons' Structural Functionalism, the differential impact on MSMEs can be analyzed as a temporary state of Disintegration. The toll road (structural input) disrupts the existing functional equilibrium of the traditional market system (Lopek Bugi's reliance on national road traffic). This disintegration forces the local system (Village Government and MSMEs) to initiate re-integrative adaptive responses (training, motivational programs)

to restore balance and prevent the complete breakdown of the traditional economic function. This reveals that the success of the Growth Pole theory is conditional upon the internal capacity of the local system to execute social adaptation and maintain functional cohesion.

The village government's attempts to provide training to negatively impacted MSMEs are an adaptive response to restore functional equilibrium. The public's continuous choice of non-toll highways for daily activities owing to cost reasons also illustrates that functional circumstances do not necessarily lead to the maximum usage of new infrastructure, but rather reflect economic concerns and habits. These dynamics highlight the complexity of infrastructure development, where economic realities often dictate public behavior and choices. As such, addressing the needs and concerns of local communities becomes crucial for ensuring that new projects achieve their intended benefits.

The results of this analysis are consistent with earlier studies demonstrating that the building of toll road infrastructure generally increases connectivity and mobility and has the potential to boost regional economic growth (Kartika Kirana et al., 2025; Annisa et al., 2024; Hamidah, 2023). The public's good view of travel time efficiency is also consistent with the findings of Adila & Saraswati (2022) regarding public acceptance of toll roads. However, this research gives a novel viewpoint by revealing the uneven impact on local MSMEs. Contrary to the prevalent belief that infrastructure always has a consistently beneficial economic impact, these data reveal that some MSMEs win, while others actually lose or have to adapt dramatically. This fills a study gap that previously tended to focus on macroeconomic repercussions or physical land changes, without diving extensively into adaptive responses at the micro-community level.

The emphasis on the intersection as a "strategic fulcrum" and the interaction between hydrological movement and space also gives a richer spatial context compared to studies that merely look at the toll corridor in general. Large-scale infrastructure development such as the Trans-Sumatera Toll Road and the interchange in Tambang District also emphasizes the complexity of the interaction between macro planning and micro realities at the community level. Although local governments have sought to perform functional response studies and provide facilities for MSMEs in rest areas, the varied impacts experienced by *Dapur Aru* and *Lopek Bugi* MSMEs demonstrate that a "one-size-fits-all" policy may not be beneficial. This shows that the effectiveness of functional adaptation for MSMEs is greatly dependent on the fundamental qualities of the business (e.g., product type, target market, innovation capacity) as well as its geographical position relative to new infrastructure. MSMEs who inherently have a wider market reach or items available from rest places are likely to gain more, while those largely reliant on existing access patterns and local clients may face considerable economic dislocation.

Furthermore, these findings also provide a critical viewpoint on the implementation of growth pole theory in the Indonesian peri-urban context. While the theory expects economic growth surrounding major investments, this research implies that such growth may not be evenly dispersed and could potentially produce new disparities at the local level. A place that becomes a "point" of strategic macroeconomic shock might upset current microeconomic arrangements. Therefore, it is crucial to understand that infrastructure development, while essential for regional connection, must be tempered with more focused and particular mitigation and empowerment measures for communities vulnerable to functional and structural changes that threaten them.

4. CONCLUSION

This research reveals that the construction of the Trans-Sumatera Toll Road in Tambang District, Kampar Regency, has generated changes in several aspects of the local community. Structurally, the area is now a vital hub in the hydrological spatial movement relationship, moving the spatial layout, changing land use from agriculture to urban, and restructuring land ownership backed by government rules. These modifications, although meant to promote connectedness and efficiency, functionally lead to uneven economic benefits. While increased access and ease of movement have proven to speed up travel and open up chances for certain SMEs and property developers, on the other hand, these changes disrupt traditional access and diminish revenue for other SMEs like Lopek Bugi in Palung Raya Village. Functional adaptation efforts are visible in the training offered by the village authority and the community's decision to continue using non-toll routes owing to cost considerations.

Scientifically, this study confirms the Growth Pole Theory, which claims that big infrastructure investments can become hubs of economic growth and urban development in the surrounding area. However, our research also reveals that the effects of development poles are not always uniformly dispersed and can potentially generate imbalances or disruptions, especially for MSMEs that rely on long-standing accessibility. This demonstrates that the presence of large-scale infrastructure leads to new social transformations, compelling diverse sections of society to make

important functional adaptations, in accordance with the ideas of Structural Functionalism. The discrepancies in MSME responses underline the relevance of the business's own qualities and its position relative to new infrastructure in determining the amount to which they are able to adapt.

The conclusions of this research are particularly relevant in planning future infrastructure development. The results can be used to build more inclusive and adaptable policies that not only evaluate macro advantages but also address negative repercussions at the local level. Specifically, more particular and focused MSME development strategies are needed, considering the diversity of business kinds and the extent of dependence on conventional access. We recommend the implementation of a Toll-Impact Mitigation Program (TIMP) focused specifically on MSMEs located in Palung Raya Village and other villages facing traditional access disruption. This program should prioritize training in digital marketing, e-commerce integration, and product diversification to shift their market dependency from physical road traffic to digital accessibility. Further research could be conducted with a long-term approach to comprehensively understand the effects of structural and functional changes, as well as comparative analysis with other areas undergoing similar infrastructure development to identify important factors in the community's successful adaptation.

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