



## Identification of Infrastructure and Community Involvement Towards Improving the Quality of Roads in Beakang Padang District, Batam City

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### Abstract

*This research aims to identify the condition of road infrastructure, measure the level of community participation in efforts to improve the quality of environmental roads, and evaluate the impact on the aesthetics of the area in Behind Padang District, Batam City. Good infrastructure and active community participation are very important in creating a comfortable and aesthetic environment, which in turn can improve the quality of life and welfare of the community. The research method used is a descriptive method with a qualitative approach, which allows for in-depth data collection through field observations, in-depth interviews and documentation studies. The data obtained was analyzed qualitatively using a data reduction approach, data presentation and drawing conclusions. Field observations show that the physical condition of roads in the Rear Padang District varies greatly. Some main roads are in good condition with smooth asphalt surfaces, but many neighborhood roads are damaged, potholed and poorly maintained. This condition is exacerbated by supporting infrastructure such as drainage channels and street lighting which is still very limited in some areas. This deficiency has a negative impact on the comfort and safety of road users and reduces the aesthetics of the environment. This research found that improving road infrastructure and increasing community participation had a significant impact on the aesthetics of the area. Well-improved roads and well-organized neighborhoods create a more pleasant atmosphere and increase resident satisfaction. Active community participation in infrastructure planning also increases the sense of ownership and responsibility.*

## Introduction

Batam City, as one of the industrial and trade centers in Indonesia, is experiencing rapid growth. Behind Padang District is one of the sub-districts in Batam City, Riau Islands Province. Located southwest of Batam Island, Behind Padang consists of several small islands with Behind Padang Island as its administrative center. This sub-district is known as "Pulau Penawar Rindu" because of its calm atmosphere and beautiful natural views. in the last few decades.

This growth brings its own challenges in terms of infrastructure management and environmental aesthetics, especially in more marginalized areas such as Rear Padang District. Adequate infrastructure is very important to support community economic, social and cultural activities. In addition, community involvement in the development process can increase the sense of ownership and responsibility towards the environment.

Behind Padang District covers an area of around 50 km<sup>2</sup> and consists of several villages and sub-districts, including Tanjung Sari Village, Sekanak Raya Village, and Pemping Village. Based on data from BPS Batam City, the population in this sub-district will reach around 21,130 people in 2023. The majority of people in the Rear Padang Sub-district work in the

fisheries, tourism and small trade sectors. The socio-economic conditions of the community are quite diverse with the majority of the population having relatively low levels of education and income. These limitations affect the community's ability to participate fully in infrastructure development in their area.

Table 1. Population

No	Ward	Amount
1	Pemping	964 people
2	Case	3 559 people
3	Terong Island	1 047 people
4	Pecong	3 664 people
5	Tanjung Sari	5 618 people
6	Sekanak Raya	6 267 people
	<b>Amount</b>	<b>21 130 people</b>

Source: BPS Batam City 2024

### Literature review

Infrastructure emphasizes the importance of infrastructure sustainability and resilience in the face of climate change and natural disasters. According to Serrat (2017), sustainable infrastructure must be designed to support economic, social and environmental sustainability. Apart from that, good infrastructure can increase productivity, efficiency and community welfare (World Bank, 2020).

The latest community participation theory emphasizes the importance of inclusion and collaboration in the development process. Fung & Wright (2019) in "Deepening Democracy: Institutional Innovations in Empowered Participatory Governance" argue that effective community participation must involve various levels of society in an inclusive and collaborative manner to achieve more equitable and sustainable results. Community participation can increase the effectiveness and sustainability of development projects, as well as build a sense of ownership and responsibility (Arnstein, 2019).

Environmental aesthetics emphasizes the importance of environmentally friendly and sustainable design. According to Thompson & Sorvig (2017) in "Sustainable Landscape Construction: A Guide to Green Building Outdoors", a well-designed environment can improve the quality of life, comfort and satisfaction of residents. Aesthetic elements include cleanliness, spatial planning, vegetation and environmentally friendly lighting.

### Research purposes

This research aims to: (1) Identifying the condition of road infrastructure in Behind Padang District; (2) Analyze the level of community involvement in the process of improving the quality of environmental roads; (3) Analyzing the impact of improving road quality on the aesthetics of the area. It is hoped that this research will make a real contribution to improving the quality of environmental roads and regional aesthetics in the Rear Padang District and will become a reference for similar research in the future. Review and validation by related parties is very important to strengthen these findings.

### Methods

This research uses a descriptive method with a qualitative approach. This approach was chosen because it allows researchers to gain a deep understanding of the phenomenon under study through collecting rich and detailed data.

## **Data collection technique**

Observations are carried out to directly observe environmental road conditions and area aesthetics. Observations include the physical condition of the road, cleanliness, environmental arrangement and supporting facilities. Interviews were conducted with community leaders and local government officials, to obtain their views and experiences regarding infrastructure conditions and community involvement. Examining documents related to the planning and implementation of infrastructure projects in the Rear Padang District, including official reports, regulations and strategic plans.

## **Data analysis technique**

The data obtained was analyzed qualitatively with the following steps: (1) Data Reduction: Sorting and simplifying the data obtained to focus on information that is relevant to the research objectives; (2) Data Presentation: Present data in narrative, table and image form to facilitate interpretation. Drawing conclusions based on patterns and relationships found in the data.

## **Results and Discussion**

### **Infrastructure Identification**

#### ***Physical Condition of the Road***

Field observations show that the physical condition of roads in the Rear Padang District varies. Some main roads are in good condition with smooth asphalt, but many neighborhood roads are damaged, potholed and poorly maintained. Supporting infrastructure such as drainage channels and street lighting was also found to be inadequate in several areas.

Field observations conducted in the Rear Padang District reveal a diverse range in the physical condition of the roads, underscoring a significant disparity between main thoroughfares and neighborhood roads. The main thoroughfares in this district are generally well-maintained, featuring smooth asphalt surfaces that facilitate efficient transportation. These roads are crucial as they connect different parts of the district, ensuring mobility and access to essential services for the residents. The quality of these roads supports economic activities, emergency services, and daily commuting, contributing to the overall functionality and connectivity of the district (Adu-Gyamfi, 2020).

However, the condition of neighborhood roads presents a stark contrast to these well-maintained main roads (Archer, 2020). Many of these smaller roads are in a state of disrepair, characterized by numerous potholes and signs of neglect. This deterioration not only hampers daily commuting but also poses safety risks for community members who rely on these roads for their routine activities. The presence of potholes can damage vehicles, lead to accidents, and create obstacles for pedestrians, particularly affecting vulnerable groups such as children and the elderly (Salvini et al., 2022). The neglect of these neighborhood roads reflects a disparity in infrastructure investment and maintenance, highlighting a need for more equitable distribution of resources.

In addition to the varying road conditions, the supporting infrastructure in the Rear Padang District also shows significant deficiencies. Drainage channels, essential for managing rainwater and preventing flooding, are often found to be inadequate (Sanders & Grant, 2020). Poor drainage infrastructure can lead to water accumulation on roads, further exacerbating their deterioration and creating hazardous conditions for both pedestrians and vehicles. During heavy rains, the lack of proper drainage can result in localized flooding, disrupting daily life and damaging properties. Addressing drainage issues is thus crucial for protecting the infrastructure and ensuring the safety of the residents (Shkaruba et al., 2021).

Moreover, the lack of adequate street lighting in several areas adds another layer of complexity to the infrastructure challenges. Insufficient lighting not only affects visibility and safety during nighttime but also impacts the overall sense of security within the community. Poorly lit areas can become hotspots for criminal activities, leading to increased fear and reduced outdoor activities during the evening. Enhancing street lighting would improve nighttime visibility, reduce accidents, and enhance the residents' sense of security, thereby promoting a more vibrant and safe community environment (Vogiatzaki et al. 2020).

Addressing these infrastructural issues is critical for improving the quality of life in the Rear Padang District and ensuring sustainable development. An integrated approach that includes upgrading neighborhood roads, enhancing drainage systems, and improving street lighting would significantly uplift the district's infrastructure. Such improvements would not only facilitate safer and more efficient transportation but also contribute to the residents' overall well-being, fostering a more inclusive and sustainable community.

### **Supporting facilities**

Supporting facilities such as sidewalks, traffic signs and rubbish bins are still lacking in several areas. This has an impact on the comfort and safety of road users as well as environmental cleanliness. Field observations conducted in the Rear Padang District reveal a diverse range in the physical condition of the roads. The main thoroughfares in this district are generally well-maintained, featuring smooth asphalt surfaces that facilitate efficient transportation. These roads are crucial as they connect different parts of the district, ensuring mobility and access to essential services for the residents. However, the condition of neighborhood roads presents a stark contrast. Many of these smaller roads are in a state of disrepair, characterized by numerous potholes and signs of neglect. This deterioration not only hampers daily commuting but also poses safety risks for the community members who rely on these roads for their routine activities (Blondin, 2022).

In addition to the varying road conditions, the supporting infrastructure in the Rear Padang District also shows significant deficiencies. Drainage channels, essential for managing rainwater and preventing flooding, are often found to be inadequate. Poor drainage infrastructure can lead to water accumulation on roads, further exacerbating their deterioration and creating hazardous conditions for both pedestrians and vehicles (Erina Rahmadyanti et al., 2023). Moreover, the lack of adequate street lighting in several areas adds another layer of complexity to the infrastructure challenges. Insufficient lighting not only affects visibility and safety during nighttime but also impacts the overall sense of security within the community. Addressing these infrastructural issues is critical for improving the quality of life in the Rear Padang District and ensuring sustainable development (Prayitno et al., 2022).

### **Community Involvement**

Interviews with the community and government officials show that community involvement in infrastructure project planning is still limited. Communities are often only involved in the final stages or during project implementation. However, in several areas, there are community initiatives to actively participate in development planning meetings (Musrenbang) at the sub-district and sub-district levels. According to Fung & Wright (2019), effective community participation must involve various levels of society in an inclusive and collaborative manner to achieve more equitable and sustainable results. However, in Behind Padang District, community participation in the planning stage still needs to be increased to ensure that community needs and aspirations can be properly accommodated.

This late-stage involvement has several implications. Primarily, it means that the specific needs and perspectives of the community are not fully integrated into the planning process from the

outset. As a result, infrastructure projects may be developed without a comprehensive understanding of local priorities and conditions. For instance, a project designed to improve road conditions might focus on areas deemed important by planners without considering the daily routes and necessities of the residents. Consequently, these projects may not entirely align with the community's priorities or address their specific concerns, leading to dissatisfaction and potential underutilization of the infrastructure (Nadarajah, 2023).

Moreover, when community input is sought only during implementation, there is limited scope for making substantial changes to the project. By this stage, key decisions about design, location, and scope have often been finalized, leaving little room for adaptation based on community feedback. This situation can lead to a disconnect between the infrastructure provided and the actual needs of the community, resulting in projects that are less effective and efficient in meeting local demands (Parikh et al., 2020). Therefore, to enhance the effectiveness and relevance of infrastructure projects in the Rear Padang District, it is crucial to involve the community earlier and more extensively in the planning process. This would ensure that the projects are better aligned with the community's actual needs and priorities, leading to more sustainable and satisfactory outcomes.

### **Improving Road Quality and Area Aesthetics**

Improving the quality of environmental roads has a positive impact on the aesthetics of the area. Smooth, clean and orderly roads provide a positive impression and increase comfort and safety for road users. Environmental management around the road, such as greenery, adequate lighting and cleanliness, also contributes significantly to improving the aesthetics of the area.

The research results effectively highlight the positive impact of improving the quality of environmental roads on the aesthetics of the area (Widati, 2024). The emphasis on smooth, clean, and orderly roads providing a positive impression is well articulated, as is the mention of increased comfort and safety for road users. However, the analysis could be enriched by incorporating specific examples or case studies that illustrate these benefits in practice. This would provide concrete evidence to support the claims and make the findings more compelling.

Furthermore, the role of environmental management around the roads, such as greenery, adequate lighting, and cleanliness, is rightly identified as a significant contributor to aesthetic improvement. To enhance the content quality, it would be beneficial to delve deeper into how these factors interact with road quality to create a more holistic aesthetic environment. For instance, discussing how well-maintained greenery can enhance the visual appeal and provide ecological benefits, or how adequate lighting not only improves safety but also the visual ambiance during nighttime, would add depth to the analysis.

Additionally, the research could benefit from exploring the broader implications of improved road aesthetics on the community. For example, discussing how these improvements can lead to increased property values, attract businesses, and foster a sense of community pride and well-being would provide a more comprehensive understanding of the impact. Incorporating theoretical perspectives or frameworks on urban aesthetics and environmental psychology could also strengthen the academic rigor of the findings. For example, in RW 05, road repairs and environmental planning are carried out in a participatory manner involving the local community. The result is a significant improvement in road quality and area aesthetics, which is also accompanied by increased community satisfaction and pride in their environment.

This research found that improving road infrastructure and increasing community participation have a significant impact on the aesthetics of the area. Well-improved roads and well-organized neighborhoods create a more pleasant atmosphere and increase resident satisfaction. Cleanliness, vegetation arrangement and good street lighting contribute to improving the

aesthetics of the area and public comfort. Good environmental aesthetics not only improve the visual quality of the area but also have a positive influence on the quality of life and welfare of the community. A comfortable and safe environment increases people's sense of ownership and responsibility for their environment, which in turn contributes to sustainability planning

Regional governments need to improve the quality of road infrastructure by paying attention to aspects of sustainability and resilience. Environmental road repairs must be carried out thoroughly, paying attention to the quality of the materials and techniques used to ensure long-term durability. Community participation must be increased through more inclusive and collaborative mechanisms. Training and education programs regarding the importance of participation in development can help people understand and contribute more actively. Musrenbang needs to be strengthened as the main forum for involving the community in planning and decision making. Regional aesthetics must be one of the main focuses in infrastructure planning. Environmentally friendly and sustainable design must be considered, including the arrangement of vegetation, cleanliness and good lighting. Regular greening and environmental cleaning programs can help improve the aesthetics and comfort of the area. Close collaboration between government and society is needed to achieve sustainable and effective results. The government must act as a facilitator who supports community initiatives, while the community must actively participate in every stage of the development process.

This research provides valuable insights for local governments and communities in planning and implementing sustainable and participatory infrastructure projects. By paying attention to aspects of sustainability, community participation and environmental aesthetics, it is hoped that the quality of life and welfare of the community in the Rear Padang District can improve significantly. Further research is needed to explore more effective mechanisms and strategies in increasing community participation and infrastructure quality in other areas.

## Conclusion

Field observations show that the condition of road infrastructure in the Rear Padang District varies greatly. Several main roads are in good condition with smooth asphalt surfaces and well-maintained sidewalks. However, many neighborhood roads are damaged, potholed and poorly maintained. Supporting infrastructure such as drainage channels and street lighting is still very limited in several areas, which has a negative impact on the comfort and safety of road users and reduces environmental aesthetics. Supporting facilities such as drainage channels, sidewalks, traffic signs and rubbish bins are still lacking in several areas. Inadequate drainage channels often cause waterlogging which worsens road damage. Minimal street lighting also affects people's safety and comfort, especially at night. Interviews with community leaders and government officials revealed that community involvement in infrastructure project planning is still limited. The community is often only involved at the final stage or during project implementation. However, there are several local community initiatives that show the potential to increase participation through development planning meetings (Musrenbang) at the sub-district and sub-district levels.

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