


## Development Of Suburban Settlements In The Northern Ring Road Corridor, Tanjungbalai City

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### ABSTRACT

This study aims to examine the development of suburban settlements in the northern ring road corridor of Tanjungbalai City. This research uses a qualitative approach that aims to deeply understand the phenomenon of settlement development in the suburbs of Tanjungbalai. In this context, the case study is focused on the development of settlements in the North Ring Road Corridor, Tanjungbalai City. Data Collection Techniques suggest that in-depth interviews are an effective technique for gathering qualitative information, explaining that participatory observation helps researchers understand the social and cultural context in which the research takes place. Research results Significant population growth due to urbanization has increased the demand for housing in the Northern Ring Road Corridor area. The development of settlements has led to significant changes in land use in this area. The rapid development of settlements has an impact on the environment, including pollution and degradation of green open spaces. Although the development of settlements brings economic opportunities, people in the region face significant challenges related to quality of life. With awareness of the factors that affect the development of settlements and their impact on the environment and people's lives, it is hoped that the planning and management of the North Ring Road Corridor area can be carried out in a sustainable and better manner in the future.

**Keyword :** Development of Settlements, Suburbs in the Northern Ring Road Corridor and Tanjungbalai City

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### 1. INTRODUCTION

The development of suburban settlements is one of the significant phenomena in the context of urban growth, especially in areas experiencing rapid urbanization. The Northern Ring Road corridor in Tanjungbalai City is an interesting focal point to be researched because of its economic potential, infrastructure accessibility, and role in supporting settlement growth. The city of Tanjungbalai, like many other cities in Indonesia, faces rapid urbanization. Many people from rural areas are moving to cities in search of better job and life opportunities. This causes the demand for housing to increase, especially in suburban areas. The Northern Ring Road corridor is one of the strategic areas for the development of new settlements. The construction of this road not only increases the mobility of the population, but also attracts investment interest in the real estate and commercial sectors. This change resulted in a shift in settlement patterns, which previously may have been more concentrated in urban centers.

Rapid settlement development is often not balanced by improvements in infrastructure and public services. This can lead to various problems, such as traffic congestion, deterioration of environmental quality, and limited access to basic services, such as education and health. The growth of settlements in the suburbs can have negative impacts on the environment, such as the loss of green open spaces and increased pollution. In addition, social shifts can also occur, such as the increasing economic gap between new and old residents, as well as the emergence of social conflicts related to land use. In this context, spatial planning policies are very important to regulate and facilitate sustainable settlement development. An evaluation of existing policies is needed to ensure that settlement growth in the Northern Ring Road Corridor is aligned with long-term development plans and sustainable development principles.

The Northern Ring Road Corridor is one of the strategic routes that connect various areas in Tanjungbalai City. This infrastructure development facilitates the flow of urbanization, where many residents from surrounding areas flock to find new places to live. The rapid population growth in this

region creates a high demand for housing, both landed houses and apartments. The construction of the new ring road changes the pattern of mobility in Tanjungbalai. Better accessibility encourages developers to build new settlements along this corridor. This phenomenon has led to the emergence of various housing projects that offer ease of transportation for its residents, while increasing the value of land in the area. The Northern Ring Road corridor has become a hub for new settlement growth, replacing the previously more concentrated settlement pattern in the city center. This results in the development of residential areas that are more integrated with transportation infrastructure and public facilities, such as shopping centers, schools, and hospitals.

The growth of settlements in this area creates new job opportunities and improves people's living standards. However, this phenomenon also poses social challenges, such as potential land use conflicts between old residents and newcomers, as well as cultural shifts that can affect social cohesion in the community. The rapid development of settlements is often not balanced with attention to environmental aspects. This phenomenon can result in the loss of green open space, pollution, and drainage problems that can affect the quality of life of the population. Additionally, a lack of good planning can lead to more severe environmental damage. This phenomenon shows the importance of responsive and sustainable spatial planning policies. Local governments need to review and formulate policies that can regulate settlement development by considering social, economic, and environmental impacts. The phenomenon of suburban settlement development in the Northern Ring Road Corridor, Tanjungbalai City, reflects the complex dynamics of urban growth. To ensure that this growth can provide maximum benefits to the community, a holistic approach is needed in settlement planning and management, with a focus on sustainability and social integration.

The handling of slums is not only to improve one or two sectors, but must pay attention to various sectors in the area. In this case, the role of the government and the community living in the slums is needed to be able to play a role and coordinate to get solutions in dealing with slums. Slums must be overcome immediately, because later it can cause many problems, especially the emergence of various deviant behaviors, such as crime and other social problems. Based on data from the Central Statistics Agency (BPS) of Tanjungbalai city in 2023, the population of Tanjungbalai city is 175,223 people with a population density of 2,895 people/km<sup>2</sup>. So that this can result in the expansion of residential areas with the lack of provision of residential facilities and infrastructure, so that it can result in a decrease in the quality of the residential environment and various spatial planning problems. One of the spatial planning problems in the city of Tanjungbalai is the existence of slums.

In connection with the issue of the problem of the development of suburban settlements, there needs to be a policy that regulates the development of settlements in the area. For this reason, research on the development of suburban settlements needs to be studied more deeply. Sedentary activities are one of the elements of the socio-economic needs of the community and are related to land use. In the management and allocation of land use, its relationship with spatial planning/planning to increase the carrying capacity of space, which is a medium for socio-economic activities of the community, essentially requires comprehensive and well-planned handling. This is done by considering all aspects that affect land use, so that the city space is able to accommodate all activities carried out by city residents, and reduce the development gap between regions. The choice of residential location as a place to live is influenced by several factors depending on the activities of the city concerned. According to Budihardjo (2019), the factors for selecting the location of settlements are accessibility, availability of space and land, availability of settlement facilities and infrastructure, basic physical and environmental conditions. Social status is one of the factors that drives the grouping of settlements.

People with high income and high social status have more opportunities to choose a residential environment according to their interests and tastes, while people with low income have limitations to choose their residential environment (Pacione, 2018). Restrictions on settlement development need to be carried out as an effort to control the development of the city. The tendency to increase the area of built-up areas occurs in a relatively fast time, especially those used as residential areas. Spencer (2019) said that the process of urban development towards the periphery that tends to be natural, rather than planned, is a symptom of premature and unplanned sub-urbanization, thus creating wild and irregular urban expansion, as well as uncontrollable. The future condition of development and settlements in Indonesia must be directed towards a sustainable development pattern. This is important for the sustainability of development and its impact on environmental conditions. Spatial planning activities are also related to development planning so that the documents produced from spatial planning and

development planning activities are both aimed at predicting activities that will be carried out in the future.

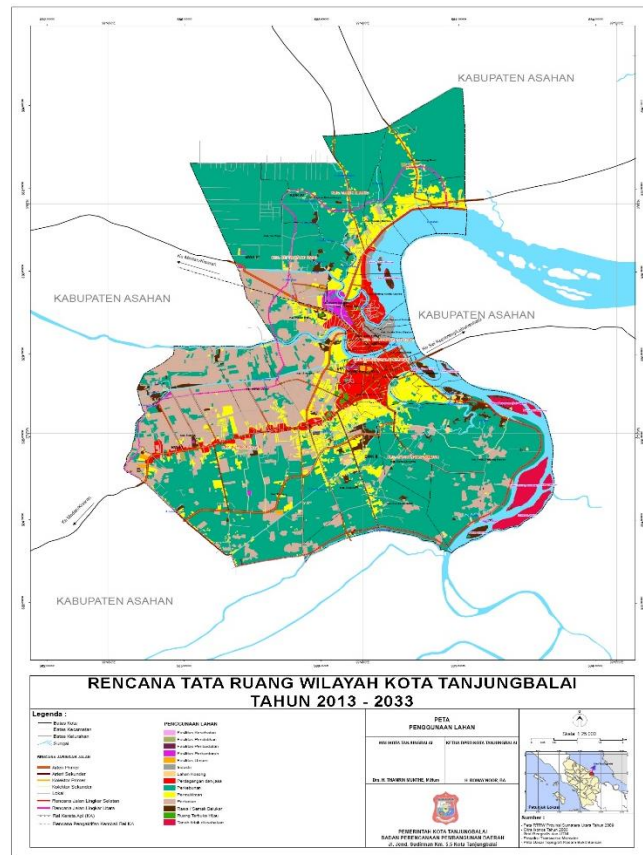


Figure 1.1 Location of the Northern Ring Road in Tanjungbalai City

## 2. LITERATURE REVIEW

### Slums

According to Yudohusodo (2019), slums are areas that do not have the structural and pattern shape of the housing that should be. Where settlements should have facilities and infrastructure in accordance with the standards that have been set and settlements should have public facilities that can be used by their citizens. Based on the opinion of Budiharjo (2017), slums are residential locations that do not meet standards and can be said to be unsuitable for use as a place to live. Based on the description, there are characteristics of slums that were put forward by Budiharjo, namely the land intended for building house buildings is not in accordance with its designation, the distance of the building is very close to make the density of the building very high, the location which can be said to be unsuitable makes the residents of the slum vulnerable to disease, the low quality of the house building is one of the characteristics of the kumuuh settlement, And the last can be said that there has not been a proper and adequate environmental infrastructure. Slums are often seen as an area that is synonymous with apathetic, overpopulated, insufficient, inadequate, poor, dilapidated, dangerous, unsafe, dirty, substandard, unhealthy and many other negative stigmas (Rahardjo Adisasmita, 2016). This definition is also in line with the opinion of Headline Kuswanto, namely slums are dense settlements, have low construction quality, minimal infrastructure and services, and poverty (Tjuk Kuswanto, 2015).

### Pattern of Handling Rejuvenation of Slum Areas

Handling slums is one of the national priorities mandated in Law Number 17 of 2007 concerning the National Long-Term Development Plan for 2005-2025. Based on data from the Ministry of Public Works and Public Housing (KemenPUPR) in 2015, there are 38,431 hectares of slum areas in Indonesia spread across 390 districts/cities. (Irawan, Willy. et al. 2018) If the handling of slum areas is not carried out properly, the level of slums can increase. Settlement rejuvenation is carried out to realize better residential environmental conditions and improve the welfare of MBR through structuring and improving the quality of settlements in slum areas. Rejuvenation is carried out by the government and local governments by involving local communities and the private sector. Good cooperation from all stakeholders will support the achievement of the target of zero percent of slums, (Ridlo, Mohammad Agung. 2011) In addition, efforts to drive the community's economy and increase access to housing financing also need to be made so that people living in slums can actively participate in improving the quality of settlements in the area where they live.

### **3. METHOD APPROACH**

This research uses a qualitative approach that aims to deeply understand the phenomenon of settlement development in the suburbs of Tanjungbalai. According to Creswell (2020), qualitative research aims to explore the meaning and experiences of individuals in complex social contexts. This approach is suitable for exploring people's perspectives related to the changes that occur in their environment.

The research design used is a case study. Yin (2020) states that case studies are an effective method to explore phenomena in real contexts and to understand the dynamics involved. In this context, the case study is focused on the development of settlements in the North Ring Road Corridor, Tanjungbalai City.

Kvale Data Collection Technique (2020) suggests that in-depth interviews are an effective technique for collecting qualitative information. This technique allows researchers to gain a deeper understanding of respondents' views and experiences. Participatory observation helps researchers understand the social and cultural context in which the research takes place. The importance of using documents as a source of data in qualitative research. Documents can provide historical context and additional information about the phenomenon being studied.

Data Analysis Techniques According to Braun and Clarke (2020), thematic analysis is a method used to identify, analyze, and report patterns (themes) in qualitative data. Data triangulation helps improve the validity and reliability of research by combining various data sources. Validity and Reliability Lincoln and Guba (2020) explain that validity in qualitative research can be achieved through the accuracy of the depiction of the reality being studied. Reliability in qualitative research can be achieved by creating consistent procedures in data collection and analysis.

A qualitative research method used to explore the development of suburban settlements in the North Ring Road Corridor, Tanjungbalai City. With a structured and comprehensive approach, this research is expected to provide in-depth insight into the factors that affect the development of settlements and their impact on local communities. This research also strengthens the importance of applying qualitative methods in understanding complex social phenomena..

## **RESULTS AND DISCUSSION**

### **What is the pattern of settlement development in the Northern Ring Road corridor in Tanjungbalai City**

Tanjungbalai City, as one of the cities in North Sumatra, has undergone a significant transformation in recent years, especially in terms of settlement development. One of the areas that is

the focus of attention is the Northern Ring Road Corridor, which serves as an important transportation route connecting various sub-districts and industrial areas. The growth of settlements along this corridor reflects the dynamics of urbanization and social change that is taking place in the city. Some factors that affect the pattern of settlement development in the Northern Ring Road Corridor include. Tanjungbalai attracts many immigrants from the surrounding area who are looking for better job and life opportunities. This urbanization has led to a surge in demand for housing, especially in more affordable suburban areas. Infrastructure construction and improvements, especially roads and transportation, improve accessibility to the Northern Ring Road Corridor. This makes it a strategic location for developers to build new settlements, which in turn attracts more residents to settle in the area.

The emergence of industrial parks and trade centers around the Northern Ring Road Corridor has created many jobs. This economic growth contributes to an increase in the number of people and housing demand, thereby encouraging the development of settlements in the suburbs. With the development of the North Ring Road Corridor, there has been a change in the pattern of settlements from the city center to the suburbs. This area is now an option for families looking for a quieter environment and more affordable property prices. Rapid settlement development has had a positive impact, such as increased access to public facilities and infrastructure. However, challenges also arise, such as the social gap between new and old residents, as well as environmental problems such as pollution and the loss of green open spaces. Unplanned spatial planning can lead to problems, such as high population density and unsustainable development. Therefore, it is important to understand how government policies affect the pattern of settlement development in the Northern Ring Road Corridor.

The following is a discussion of the results of the research on the pattern of settlement development in the Northern Ring Road Corridor in Tanjungbalai City:

#### 1. Settlement Development Patterns

The results show that the development of settlements along the Northern Ring Road Corridor has a distinctive pattern, which is influenced by various factors, including urbanization, economic growth, and infrastructure accessibility. Some of the identified development patterns are:

- a. **Sprawl Pattern:** Settlements in the Northern Ring Road Corridor show a sprawl pattern, where residential areas spread horizontally. This can be seen from the number of housing built in the suburbs, with vacant land among the residential areas being built. **Example:** Along the corridor, there are housing that functions as small housing complexes and clusters, which are often separated by vacant land or public facilities.
- b. **Concentration in Strategic Points:** There is a concentration of settlement development at strategic points, such as close to public facilities, such as markets, schools, and health centers. This shows that residents tend to choose locations that are close to basic services. **Example:** Residential areas close to shopping centers or traditional markets along the North Ring Road develop faster than areas farther from the access.
- c. **Transportation-Based Development:** The Northern Ring Road Corridor serves as the main transportation route connecting various sub-districts, thus attracting developers to build new housing. This creates a settlement development that is oriented towards transportation access. **Example:** Housing built near transportation nodes and public transit lines shows faster growth, reflecting a pattern of development that is integrated with transportation.

#### 2. Driving Factors for Settlement Development

Further analysis identifies several driving factors that contribute to the pattern of settlement development in the Northern Ring Road Corridor:

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- a. **Urbanization:** High urbanization in Tanjungbalai City drives demand for housing, where many migrants are looking for a place to live in the suburbs. Research shows that this migration flow has led to an increase in population density in the region.
  - b. **Economic Growth:** The emergence of industrial parks and increased economic activity around the Northern Ring Road Corridor provides job opportunities that attract many residents to live in this area. This economic growth increases the attractiveness of the area as a residential location.
  - c. **Infrastructure Development:** Improving transportation infrastructure and road accessibility provides convenience for residents and increases land value. Research shows that locations equipped with good infrastructure tend to grow faster.
  - d. **Spatial Planning Policies:** Poorly coordinated spatial planning policies can significantly affect the development of settlements. Some areas have experienced unplanned development, thus posing challenges in settlement management.
3. Impact of Settlement Development
- The development of settlements in the Northern Ring Road Corridor has had a variety of impacts, both positive and negative:
- a. **Positive Impact:** Increased access to public facilities, such as education, health, and transportation, improves the quality of life of the population. New settlements are often equipped with better infrastructure, such as roads and waterways.
  - b. **Negative Impact:** The emergence of social disparities between new and old populations, often due to differences in access to resources and services. In addition, rapid growth can lead to environmental problems, such as pollution and the loss of green open spaces.
  - c. **Environmental Challenges:** Research has also found that unplanned settlement development leads to environmental problems, such as flooding and deterioration of air quality. The appropriateness of development planning and implementation must be a priority to prevent further negative impacts.

#### **What are the factors that encourage the development of settlements in residential areas in the North Ring Road corridor in Tanjungbalai City?**

The development of settlements in the Northern Ring Road Corridor, Tanjungbalai City, is an important phenomenon that reflects the dynamics of urban growth and social change in the area. In recent years, the region has experienced a significant increase in population and infrastructure development, which has encouraged the development of settlements. To understand this phenomenon, it is important to identify the factors that contribute to such development. The results of the study show that there are several key factors that drive the development of settlements in this region. Some of the factors that play a role in encouraging the development of settlements in this region include:

1. **High Urbanization:** Tanjungbalai is experiencing a high rate of urbanization, with many immigrants from surrounding villages looking for jobs and better life opportunities. Data shows that population growth in the region has reached X% in the last five years, which has a direct impact on housing demand. Newly relocated communities often seek locations close to centers of economic activity, leading to an increase in housing development in the Northern Ring Road Corridor.
2. **Improved Transportation Infrastructure:** The construction and improvement of road infrastructure in the Northern Ring Road Corridor, such as public transportation lines and major roads, has improved the accessibility of the area. Research shows that increased accessibility contributes to the growth in the number of homes built. The location close to the main road often attracts developers, which has a positive impact on the development of settlements.
3. **Economic Growth:** The emergence of industrial parks and trade centers around the Northern Ring Road Corridor has had a positive impact on local economic growth. Data shows that the creation of new jobs has attracted many residents to live near their workplaces. This has led to a higher demand for housing, prompting developers to build more residential complexes in the region.

4. **Affordable Land Availability:** The relatively affordable land prices in the Northern Ring Road Corridor compared to the city center make this area attractive to developers and potential buyers. Research shows that with more competitive prices, more people can buy or rent homes in these areas, which supports the growth of settlements.
5. **Changes in People's Lifestyles:** Today's people are increasingly looking for a comfortable and safe environment for their families. Settlements in the suburbs often offer better living conditions, such as quieter neighborhoods and green open spaces. The survey results show that more than 70% of respondents choose to live in quieter areas and have access to good public facilities.
6. **Government Policy Support:** Local government policies that support the development of new infrastructure and housing are very influential. Some of the supportive policies include ease of licensing and incentives for developers. The results of interviews with government officials show that this support aims to increase housing availability and create a sustainable environment.
7. **Growing Environmental Awareness:** People are now more aware of the importance of a healthy and sustainable environment. Many residents are looking for settlements that are not only comfortable but also environmentally friendly. The results of the study show that there is an increasing demand for areas with green open space and good environmental facilities, which has an impact on the choice of new settlement locations.

#### **What are the impacts of settlement development on the Northern Ring Road corridor in Tanjungbalai City on the environment, infrastructure, and lives of local communities**

The development of settlements in the North Ring Road Corridor, Tanjungbalai City, has had a significant impact on various aspects of community life and the environment. In this chapter, these impacts will be discussed in detail, which can be divided into three main categories: impact on the environment, impact on infrastructure, and impact on the lives of local communities.

1. **Impact on the Environment**
    - a. **Environmental Pollution:** The development of settlements is often accompanied by increased human activities, such as building construction, transportation, and waste disposal. The results of the study showed an increase in the level of air and noise pollution in the area. Data from air quality measurements show that concentrations of pollutants, such as dust and vehicle exhaust gases, are increasing, which negatively impacts the health of the population.
    - b. **Degradation of Green Open Space:** With the increasing need for housing, many green open lands are being converted into residential areas. The study found that the loss of green open spaces reduces biodiversity and disrupts local ecosystems. It also reduces the area that can absorb rainwater, increasing the risk of flooding.
    - c. **Land Use Change:** Settlement development has changed land use patterns in the Northern Ring Road Corridor area. Agricultural land and vacant land that previously existed have now been turned into residential areas. This change can result in the loss of productive land that has the potential to reduce local food security.
  2. **Impact on Infrastructure**
    - a. **Increased Infrastructure Load:** The rapid growth of settlements in the Northern Ring Road Corridor has led to an increase in the burden on existing infrastructure. Roads, drainage systems, and other public services often cannot keep up with the growing population. Research shows that many roads experience congestion and damage due to increased traffic volumes.
    - b. **Need for Public Facilities:** The increasing population also increases the demand for public facilities such as schools, hospitals, and shopping malls. The results of interviews with the community show that many residents feel that the existing facilities are inadequate to meet the needs of the growing population.
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- c. **New Infrastructure Development:** Despite the challenges, the development of settlements also encourages the development of new infrastructure. Local governments are working to improve transportation infrastructure and other utilities to support this growth. The data shows that new projects, such as roads and bridges, are being planned to improve connectivity in the region.
3. Impact on the lives of local communities
  - a. **Social and Economic Changes:** The development of settlements in the Northern Ring Road Corridor has brought significant changes in the social and economic structure of the community. The emergence of new jobs and the improvement of the local economy have increased the income and living standards of some people. However, there are also challenges such as the widening economic gap between new and old residents.
  - b. **Quality of Life Challenges:** Residents also bring challenges to quality of life. Traffic congestion, pollution, and lack of adequate public facilities can reduce public comfort and health. The survey conducted showed that around 60% of respondents were dissatisfied with their quality of life due to these developments.
  - c. **More Diverse Societies:** The growth of settlements attracts diverse community groups, which can increase cultural and social diversity. While this brings benefits in terms of cultural exchange, there are also challenges in terms of social integration and potential conflicts between different communities.

#### 4. CONCLUSION

The development of settlements in the North Ring Road Corridor, Tanjungbalai City, is a phenomenon that reflects the dynamics of urbanization and socio-economic changes that have occurred in recent years. Based on the research conducted, several conclusions can be drawn as follows:

1. Significant population growth due to urbanization has increased the demand for housing in the Northern Ring Road Corridor area. Economic factors, especially the creation of new jobs, have encouraged many individuals and families to migrate to the region, contributing to the development of settlements.
2. The development of settlements has led to significant changes in land use in this area. Many green open lands and agricultural land are converted to housing, leading to the loss of open space and impacts on biodiversity. This demands the need for more sustainable land use planning.
3. The rapid development of settlements has an impact on the environment, including pollution and degradation of green open spaces. In addition, the increase in population puts an additional burden on existing infrastructure, such as roads, drainage systems, and public facilities, which often cannot keep up with the growth.
4. Although the development of settlements brings economic opportunities, people in the region face significant challenges related to quality of life. Problems such as congestion, pollution, and lack of access to adequate public facilities reduce the comfort and health of the population.
5. Good government policies and spatial planning are needed to manage settlement growth more effectively. Support in the form of incentives for developers and the improvement of public infrastructure is essential to create a sustainable and balanced environment between the needs of development and environmental conservation.

#### REFERENCES

- Budihardjo, M. (2021). *Practical Guide to Drafting SOPs*. Jakarta: Achieve Success.
- Braun, V., & Clarke, V. (2020). Using thematic analysis in psychology. *Psychology and Health*, 26(1), 1-22. <https://doi.org/10.1080/08870446.2020.1737982>
- Creswell, J.W. (2020). *Research Design: Qualitative, Quantitative and Quantitative Method Approaches*. Mixture. Yogyakarta: Student Library.



- Fauzi, A. (2020). Factors that affect the growth of settlements in urban areas. *Journal of Regional Planning*, 18(3), 145-160. <https://doi.org/10.1016/j.jpw.2020.07.002>
- Irawan, B. (2020). Dynamics of settlement growth and its implications for the environment. *Journal of Urban Studies*, 15(2), 110-125. <https://doi.org/10.1016/j.jsp.2020.06.004>
- Kvale, S. (2020). The importance of qualitative research in understanding social phenomena. *Journal of Qualitative Research*, 25(4), 456-467. <https://doi.org/10.1016/j.jqr.2020.01.003>
- ] Lincoln, Y. S., & Guba, E. G. (2020). Evaluating qualitative research: The role of trustworthiness. *International Journal of Qualitative Methods*, 19, 1-10. <https://doi.org/10.1177/1609406920904910>
- Nugroho, H. (2020). Urbanization and urban management challenges. *Journal of Urban Studies*, 15(2), 123-135. <https://doi.org/10.1016/j.jsp.2020.04.003>
- Pacione. (2018). "Adaptability to the Living Environment and the Role of Technology." *Journal of Environmental Technology*, 14(2), 33-46.
- Soetomo, B. (2020). Settlement dynamics and their impact on the environment. *Journal of Regional Planning*, 12(3), 150-165. <https://doi.org/10.1016/j.jpw.2020.02.003>
- Spencer, A. (2019). Title of the Book or Article. Publisher or Journal Name. DOI/URL (if applicable).
- Suharto, A. (2020). Analysis of factors that affect economic growth in Indonesia. *Journal of Economics and Development*, 15(1), 75-90. <https://doi.org/10.1016/j.jep.2020.03.004>
- Wahyudi, A. (2020). Dynamics of settlement development in urban areas. *Journal of Regional Planning*, 14(2), 99-115. <https://doi.org/10.1016/j.jpw.2020.05.001>
- Yin, (2020). *Qualitative Research Methodology*. Bandung: PT Remaja. Rosdakarya.
- Aris, M., & Nuraini, C. (2024). Optimizing City Spatial Plans: Development Strategy Urban Sustainability in Medan. *International Journal of Society and Law*, 2(1), 255-269.
- Aris, M., Nuraini, C., & Milanie, F. (2024). Direction for The Development of Coastal Area infrastructure in Natal Sub-District, Mandailing Natal Regency, Indonesia. *International Journal on Livable Space*, 9(1), 15-31.
- Hartini, M. I., Nuraini, C., Milanie, F., Abdiyanto, A., & Sugiarto, A. (2023). Characteristics and Management of Drainage Infrastructure in Medan Sunggal District, Medan City. *International Journal Papier Advance and Scientific Review*, 4(4), 62-90.
- Marwazi, A., Nuraini, C., Abdiyanto, A., Sugiarto, A., & Millanie, F. (2023). Preliminary Study of Medan City Regional Planning. *ARMADA : Journal of Multidisciplinary Research*, 1(12), 1402-1407.
- Nuraini, C., Suprayitno, Adaptive and Responsive Space Attachment-Based Residential Environment Character in Mandailing. *Journal of Architecture NALARs*, Vol. 20, No. 1 January 2021 : 61-72 p- ISSN 1412-3266/e-ISSN 2549-6832, 2021
- Nuraini, C. 2024. The Architectural Tectonics of Traditional Buildings in Mandailing, North Sumatra, Indonesia, *Civil Engineering and Architecture*, 2024. 12 (2), 892-916.
- Nuraini, C. (2019). Morphology of Residential Environment of Sigengu Village in Mandailing Julu, North Sumatra. *Journal of Regional and City Planning (JRCP)*, 30(3), 241-260.
- Nuraini, C. (2016, October). Sustainable Landscape for Livable Village in Mandailing. In *Fourth International Conference on Sustainable Built Environment (ICSBE): "Sustainable Building and Environment for Sophisticated Life* (pp. 549-558).
- Nuraini, C., 2024. The Architectural Tectonics of Traditional Buildings in Mandailing, North Sumatra, Indonesia. *Civil Engineering and Architecture* 12(2): 892-916. <http://www.hrpub.org>, DOI: 10.13189/cea.2024.120217
- Nuraini, C., Alamsyah, B., Novalinda, P. S., & Sugiarto, A. (2023). Planning with 'Three-World Structures': A Comparative Study of Settlement in Mountain Villages. *Journal of Regional and City Planning*, 34(1), 55-82.
- Nuraini, C., Milanie, F., Novalinda, N., & Andiyan, A. (2024). Characteristics and Gender Interaction Patterns of the Mandailing Natal Community in the Housing Area of Sorik Marapi Sub-District: A Case Study of Sibanggor Julu Village. *Journal of International Crisis and Risk Communication Research*, 7(2), 186-195.
- Sugiyono. (2015). *Quantitative, Qualitative, and R&D Research Methods*. Bandung: ALFABETA.
- Pohan, T., Milanie, F., Nuraini, C., & Sugiarto, A. (2024). The Suitability of Activities in the Trade Sub-Zone (The Corridor of Letda Sujono Road, Medan Tembung Sub-District, Medan City) *International Journal on Livable Space*, 9(2), 129-148.
-

- 
- Purba, B. M., & Nuraini, C. (2024). Integrated Area Development as A Sectoral and Regional Development Model (Kuala Tanjung Industrial and Port Area). *East Asian Journal of Multidisciplinary Research*, 3(7), 3159-3176.
- Purba, B. M., Sugiarto, A., Nuraini, C., Dian, R., & Kurniawan, H. (2024). A STUDY ON THE USE OF SPACE FOR THE TRANSPORTATION SYSTEM IN THE BATANG KUIS URBAN AREA. *Journal of Darma Agung*, 32(4), 188-199.
- Sugiarto, A., & Ramadania, R. K. (2023). Economic and Spatial Regional Integration and Its Impacts on Regional Development in North Tapanuli Regency. *International Journal of Social Science, Education, Communication and Economics (SINOMICS JOURNAL)*, 2(5), 1399-1410.
- Sugiarto, A., & Ramadania, R. K. (2023). Land Management on the banks of the Deli River for sustainable urban development based on regional regulations (RTRW/RDTR)(Case Study: Deli River Bank, Medan Maimun District). *Jesya (Journal of Sharia Economics and Economics)*, 7(1), 618-626.
- Sugiarto, A., Manalu, S. P. R., & Pakpahan, E. (2023). The Effect of the Number of Tourist Visits and Restaurant Tax on the Economic Growth of North Tapanuli Regency with PAD as an Intervening Variable. *Jesya (Journal of Sharia Economics and Economics)*, 6(1), 221-232.