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Analysis of Urban Spatial Planning Implementation in the Wania Riverbank Area in Asmat Paumako Village, Timika, Papua, Indonesia

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ABSTRACT

This study aims to analyze the implementation of urban spatial planning in the Wania Riverbank area, Asmat Paumako Village, Timika, Papua, explicitly focusing on the factors influencing policy implementation and the resulting socio-ecological impacts. Using a qualitative descriptive method with a field study approach, this study explores in depth the relationship between formal spatial planning policies and the local wisdom practices of the Asmat indigenous community. Primary data were obtained through in-depth interviews, participatory observation, and relevant secondary documents such as the Detailed Spatial Planning Plan and related regional regulations. This approach allows for a holistic understanding of the constraints and opportunities in spatial planning implementation in an area with unique socio-cultural and ecological characteristics. The research results show that implementing spatial planning in the Wania Riverbank area faces various obstacles, including weak communication and coordination between government agencies, limited technical and financial resources, and differences in paradigms between the Asmat community's customary legal system and formal government regulations. The inconsistency of spatial utilization practices with the official provisions in the Detailed Spatial Plan leads to the risk of ecological degradation, such as a decline in the function of riverbank habitats, increased vulnerability to flooding, and the emergence of social conflict. In addition, the research emphasizes the importance of recognizing and integrating local wisdom in the spatial planning and management process to increase the effectiveness of implementation and social legitimacy. These findings also reinforce George Edward III's policy implementation theory, which emphasizes the importance of effective communication, resource availability, and implementer disposition for successful implementation, and supports an inclusive and sustainable urban planning approach that balances physical, social, and ecological aspects. This research provides important empirical and conceptual contributions to formulating spatial planning policies in regions with complex socio-cultural and ecological characteristics, such as Papua, while emphasizing the need for a multisectoral, participatory, and adaptive approach to urban space management. Therefore, this research is a strategic foundation for local governments, communities, and other stakeholders in harmoniously and sustainably managing riverbank areas for inclusive and environmentally friendly development.

Keywords: Spatial Planning Implementation, Riverbanks, Asmat Indigenous Community, Urban Spatial Planning, Papua.



I. Introduction

Urban spatial planning is central to achieving sustainable, productive, and balanced regional development. Spatial planning is key to managing urban growth's physical and social impacts, particularly in areas with potential ecological vulnerabilities, such as riverbanks. Therefore, implementing effective, evidence-based spatial planning is essential to maintaining environmental sustainability while improving the quality of life for urban communities (Firman, 2009). As a constitutional basis, Article 33 paragraph (3) of the 1945 Constitution emphasizes that the management of natural resources must be carried out to the greatest extent possible for the prosperity of the people, demanding a balance between economic exploitation and the fulfillment of social welfare and environmental preservation (Sutaryo, 2017). In line with the constitution, Law No. 26 of 2007 concerning spatial planning directs that spatial planning must be arranged with sustainable patterns and structures, paying comprehensive attention to ecological, social, and economic aspects. Thus, inclusive and environmentally aware development is Indonesia's primary foundation for urban spatial planning (Arifin, 2016).

Specifically in the context of regional autonomy, districts and cities are given full authority to manage and design the spatial planning of their respective administrative areas, including preparing spatial planning, spatial utilization, and spatial control (Hammar, 2008). However, implementing spatial planning policies in the regions often faces complex challenges, ranging from limited technical capacity and a lack of coordination between agencies to socio-economic interests of the community that are not always in line with applicable regulations (Meyer, 2011). At the national level, the 2005-2025 National Long-Term Development Plan (RPJPN) underscores Indonesia's development vision toward an independent, advanced, just, and prosperous nation (Law No. 17 of 2007). Specifically, the RPJPN mandates balanced regional development, considering each region's various ecological and socio-cultural aspects (Kuncoro, 2013). Meanwhile, the third phase of the National Medium-Term Development Plan (RPJMN) (2015–2019) emphasizes increasing regional competitiveness through sustainable resource management, particularly in economically and ecologically strategic regions (Bappenas, 2015).

However, spatial planning implementation practices in various regions of Indonesia, particularly in areas with unique geographic conditions like Papua, are still suboptimal. Problems such as uncontrolled settlement planning in riverbank areas can lead to ecological degradation, flooding, environmental degradation, and social threats such as poverty and spatial inequality (Sari et al., 2019). This condition is relevant for analysis in the Wania Riverbank area in Asmat Paumako Village, Timika, Papua, an urban area with unique social, economic, and environmental dynamics. Geographically, Mimika Regency, with its capital in Timika, Papua Province, has experienced rapid development since becoming an autonomous region in 2000 (Government Decree No. 5 of 2000). With an area of 19,592 km², Mimika has a highly varied topography, ranging from lowland swamps, the Jayawijaya Mountains in the north, to the Arafura Sea in the south (BPS Mimika Regency, 2022). This geographical condition presents unique challenges in spatial planning, particularly in managing riverbank areas vulnerable to flooding and environmental damage.

The Wania Riverbank area has historically been home to the East Mimika District's indigenous Asmat Paumako Village community. This area holds significant economic potential, with rapidly expanding trade and service activities in line with the growth of Timika City, which has been impacted by the surrounding mining industry (Margaret, 2018). However, rapid and uncontrolled urbanization has reduced green open space and increased the risk of damage to the river and riverbank ecosystem (Hermawan, 2021). According to research by Wilman (2020), the riverbank area in Timika has a residential development pattern that does not fully align with the established Detailed Spatial Plan (RDTR). This is due to weak oversight and a mismatch between government policies and the local community's needs, most of whom still rely on traditional lifestyles and customary land management systems. This problem is further exacerbated by minimal public awareness of preserving riverbank areas as public spaces and vital ecosystems (Wandira, 2019).

Several issues exist, such as the inconsistency of spatial planning implementation with established policies, particularly regarding land use control in riverbank areas. New settlements and growing economic

activities tend to be outside the RDTR provisions, which can potentially cause spatial conflicts and environmental damage (Sutaryono et al., 2020). There is a lack of synergy and coordination between relevant agencies, from local governments and village officials to traditional institutions with land management authority. This factor affects the effectiveness of supervision and law enforcement in implementing existing spatial planning (Yulianto & Syahputra, 2017). Limited financial, technical, and human resources are needed to manage spatial planning in riverbank areas. These limitations hamper the development of information systems, environmental monitoring, and the implementation of infrastructure development in accordance with spatial planning provisions (Damanik, 2019). There are differences in perception between local communities that still refer to the customary legal system and formal government policies based on state law. This gap hinders public participation in spatial planning and implementation and creates social resistance to existing regulations (Utomo, 2018). The lack of control over land use in riverbank areas threatens ecological and social damage, including flooding, habitat degradation, and declining the community's quality of life due to uncontrolled urbanization (Fauzi, 2020).

Previous research in similar areas has broadly discussed macro-level regional planning and general policies at the district level (Hidayat, 2016). However, there is little specific study on implementing spatial planning in riverbank areas using a multidisciplinary approach considering social, cultural, economic, and ecological aspects. This creates an important gap that must be filled to provide comprehensive and applicable recommendations for sustainable spatial planning of the Wania Riverbank area. Riverbank areas are highly strategic, environmentally, and socially. Rivers regulate hydrology, produce biodiversity, and provide water for human activities (Merritt et al., 2010). Therefore, urban spatial planning implemented in these areas must ensure the preservation of the river's ecological function while accommodating urban development needs. According to Nasution & Simatupang (2015), poor spatial planning along riverbanks can exacerbate the risk of disasters such as floods and landslides and cause significant socioeconomic losses. This underscores the importance of implementing spatial planning policies that are not only formal but also integrated with a participatory and adaptive approach to local characteristics.

Furthermore, riverbank areas in Papua, such as Timika, have strong socio-cultural characteristics. Indigenous communities, such as those in the Asmat Paumako Village, have land management systems based on local wisdom and customs, which often differ from the formal government paradigm (Simanjuntak, 2017). Therefore, this study is also highly relevant in identifying how urban spatial planning can be implemented inclusively and respect indigenous communities' rights. The urgency of this research is crucial given the rapid growth dynamics of Timika City, particularly in the Wania Riverbank area in the Asmat Paumako Village, which presents serious challenges in urban spatial planning management. Uncontrolled growth has the potential to cause various problems, ranging from environmental damage to the disruption of riverbank ecosystems and social conflict due to the inconsistency of spatial use with applicable spatial plans. A lack of coordination between government agencies, limited resources, and differences in land management systems between formal regulations and the local wisdom of indigenous communities exacerbate this condition. Therefore, this research is very urgent to provide an accurate picture of how spatial planning implementation takes place in an area with unique socio-cultural and environmental characteristics, while also identifying obstacles and appropriate solutions for achieving sustainable development.

The main objective of this study is to comprehensively analyze the implementation of urban spatial planning in the Wania Riverbank area, specifically in the Asmat Paumako Village, by examining the factors that influence its success and obstacles in its implementation. This study also aims to uncover the interaction between government policies and local community practices in spatial management, thereby providing policy recommendations that are more inclusive, participatory, and adaptive to local needs and conditions. Thus, the results of this study are expected to provide strategic considerations for local governments, stakeholders, and the community in increasing the effectiveness of harmonious spatial planning between urban development and environmental conservation in the riverbank area. It is important to emphasize that the successful implementation of urban spatial planning on the Wania Riverbank in the Asmat Paumako Village reflects the ability of the local government and community to bridge the gap between the national

development vision and local social and environmental conditions harmoniously and sustainably. Therefore, this study is expected to open new insights and fill the knowledge gap in urban spatial management in Papua, which is full of ecological challenges and socio-cultural dynamics.

II. Literature Review and Hypothesis Development

2.1. Theoretical Concept of Urban Spatial Planning and Its Implementation

Urban spatial planning is arranging space to create harmony between human activities, the physical environment, and the socio-economic system in urban areas. Good spatial planning and management are crucial for sustainable, productive development, accommodating various community interests (Arifin, 2016). According to Law No. 26 of 2007 concerning Spatial Planning, spatial planning is structured with patterns and structures that regulate the use of space to balance physical development, environmental protection, and socio-economic equality. In the context of implementation, George Edward III (in Hammar, 2008) emphasized that the success of spatial planning policy implementation is influenced by three main factors: effective communication to convey policy information clearly and consistently, the availability of both human and financial resources, and the disposition (attitude) of policy implementers that is synergistic and responsive to obstacles in the field. Without fulfilling these factors, spatial planning implementation cannot run optimally, even though the spatial plan has been well prepared. In line with this concept, Permana (2023) emphasized that spatial planning policies play a crucial role in controlling urban development, ensuring it remains directed, maintains a balance between economic growth and environmental aspects, and involves the active participation of the community and stakeholders. Difficulties in implementing spatial planning often arise from weak inter-agency coordination, sectoral conflicts of interest, limited oversight, and ineffective legal enforcement.

2.2. Riverbank Area Management in Urban Spatial Planning

Riverbank areas are zones with important ecological functions, such as water management, biodiversity habitats, and flood buffers. Therefore, spatial planning in these areas must prioritize protecting ecological functions while accommodating the socioeconomic needs of communities living along riverbanks (Merritt et al., 2010). Poor spatial planning in riverbank areas has been shown to exacerbate the risk of environmental disasters, such as floods and landslides, and reduce the quality of life (Nasution & Simatupang, 2015). Research by Sidabutar & Sugiarto (2025) in the context of urban rivers in Pematang Siantar shows that many informal settlements have been built along riverbanks, resulting in dense settlements and a reduction in green open space. This condition has led to a decline in the ecological function of riverbanks and increased vulnerability to flooding. Therefore, they emphasize the need to develop riverbank areas into inclusive and sustainable public spaces with participatory community-based management. In Papua, particularly in the Timika region, the relationship between urban spatial planning and the local wisdom of indigenous communities is critical. A study by Bina et al. (2018) shows that integrating participatory mapping of indigenous communities into spatial planning in Papua increases policy legitimacy and strengthens cultural conservation and environmental functions. This is crucial in legal pluralism, where customary and state legal systems coexist (Simanjuntak, 2017). Recognizing indigenous territories in spatial planning can bridge the social and political gaps that have hampered regional spatial management.

2.3. Research Gaps and Hypotheses

Although numerous studies on spatial planning in Indonesia and urban riverbank areas have been conducted, several research gaps remain, which pose significant challenges, particularly in the Papuan context and areas with socio-cultural characteristics such as the Asmat Paumako Village. First, most research on spatial planning in urban areas remains macro- and sector-specific, lacking a thorough understanding of

local implementation using a multidisciplinary approach that simultaneously combines environmental, social, and cultural aspects (Hidayat, 2016; Damanik, 2019). This often results in policy recommendations being less responsive to the needs of indigenous communities and the specific conditions of ecologically sensitive urban areas such as riverbanks. Second, spatial planning in riverbank areas in Papua still faces significant challenges, including minimal coordination between local government agencies, a lack of technical capacity, and land management conflicts between formal regulations and local wisdom that have not been optimally accommodated (Yulianto & Syahputra, 2017; Utomo, 2018). These differing paradigms have given rise to social resistance that negatively impacts the effectiveness of spatial planning policy implementation. Third, implementing spatial planning along riverbanks often fails to prioritize ecological functions and disaster risk mitigation, potentially leading to significant environmental and social losses (Fauzi, 2020). This gap highlights the need for studies integrating technical aspects of spatial planning with a comprehensive socio-cultural and environmental conservation approach.

Based on a review of previous theories and research findings, this study proposes the following hypothesis:

1. The implementation of urban spatial planning in the Wania Riverbank area in Asmat Paumako Village, Timika, Papua has experienced significant obstacles caused by minimal coordination between agencies, limited resources, and differences in land management systems between formal regulations and the local wisdom of indigenous communities.
2. These obstacles impact the non-compliance of spatial utilization with the provisions of the Detailed Spatial Planning Plan, thus potentially reducing the ecological function of riverbanks and causing social conflict.
3. Increasing the effectiveness of spatial planning implementation can be achieved through a participatory approach involving indigenous communities, strengthening cross-sector coordination, and integrating ecological conservation into spatial planning policies.

III. Research Method

The research methodology in the study "Analysis of Urban Spatial Planning Implementation in the Wania Riverbank Area in Asmat Paumako Village, Timika, Papua" uses a descriptive qualitative approach with a focus on in-depth exploration of field phenomena related to spatial planning implementation in areas with socio-cultural and environmental complexity (Creswell, 2014). This approach was chosen to understand the meaning, social dynamics, and interactions between formal spatial planning policies and the local wisdom practices of the Asmat Paumako indigenous community, which are difficult to reveal quantitatively (Denzin & Lincoln, 2011). The primary data collection techniques included in-depth interviews and participant observation in the field. Semi-structured interviews were conducted with key informants such as the Head of Asmat Paumako Village, local government officials, indigenous community leaders, and business actors involved in riverbank spatial utilization. This technique allowed for open data collection while focusing on critical issues in spatial planning implementation that aligned with the research questions. Field observations were conducted to obtain a direct picture of the physical condition of the Wania Riverbank area, spatial utilization patterns, and social interactions, resulting in richer and more contextual data (Marshall & Rossman, 2016). Secondary data were selected by reviewing official documents such as the Detailed Spatial Planning Plan (RDTR), regional regulations related to spatial planning, government reports, and previous research relevant to the context of urbanization and riverbank spatial planning in Papua. These documents were selected based on thematic relevance and current data to provide an overview of the policy and regulatory framework that serves as a reference for implementation in the field and to support the triangulation of primary data (Bowen, 2009). Theoretical literature on spatial planning policy implementation, such as the George Edward III model (in Hammar, 2008) and the approach of integrating local wisdom in spatial planning

(Simanjuntak, 2017), served as a conceptual basis that aligns with the socio-cultural and environmental characteristics of the Asmat Paumako Village.

The data collection design was developed based on research questions that focused on factors influencing the success and obstacles of spatial planning implementation, the coherence between formal policies and indigenous practices, and the resulting socio-ecological impacts. A descriptive qualitative approach allowed researchers to detail the actual conditions on the ground, explore actors' perceptions, and explain the implementation process holistically (Moleong, 2017). Therefore, this method is highly appropriate for illustrating the complex relationship between the formal legal system and indigenous wisdom in the context of urban spatial planning in Papua. Data analysis was conducted qualitatively using a deductive-inductive approach, combining interview and observation data coding with interpretation based on the selected theoretical framework. The analysis process included data reduction through sorting relevant information, presenting data as a thematic narrative, and drawing conclusions that linked field findings to theories of spatial planning implementation and customary space management (Miles, Huberman, & Saldaña, 2014). Data triangulation was conducted to ensure the validity and reliability of the findings by comparing various primary and secondary data sources. With this methodology, the study can provide a comprehensive understanding of the actual state of spatial planning implementation on the banks of the Wania River, identify structural and sociocultural constraints, and offer contextual and inclusive policy recommendations for sustainable development in the region.

IV. Results and Discussion

4.1. Overview of Timika Regency

With its capital in Timika, Central Papua Province, Mimika Regency is located between 1340 31' - 1380 31' East Longitude and 40 60' - 50 18' South Latitude. Mimika has an area of 21,694 hectares, or 4.75% of the total area of Papua Province. Mimika Regency has the following administrative boundaries:

- a. To the north, it borders Uwapa District, Mapia District, and Kamu District, Nabire Regency, Tigi District, East Tigi District, and East Paniai District, Paniai Regency, as well as Ilaga District, and Beoga District, Puncak Jaya Regency;
- b. To the south, it borders the Arafura Sea;
- c. To the west, it borders Kaimana Regency;
- d. To the east, it borders the Asmat Regency.

Mimika Regency has 12 districts/sub-districts. They include West Mimika, Far West Mimika, Central West Mimika, East Mimika, Central East Mimika, Far East Mimika, New Mimika, Kuala Kencana, Tembagapura, Agimuga, Jila, and Jita. West Mimika District has the largest area, namely 14.87% of the area of Mimika Regency, and Kuala Kencana District is the smallest district, namely only 2.61% of the total area of Mimika Regency.

4.2. Overview of East Mimika District

East Mimika is one of 18 sub-districts in Mimika Regency, with its capital in Wania Village. The distance from the Mimika Regency capital to the Mimika Timur (Wania) sub-district capital is 30 km, with the district's elevation being 30 m above sea level. Geographically, East Mimika District is located at 136° 2' 35" East Longitude 4° 26' 34" South Latitude. Administratively, East Mimika District consists of 6 villages/hamlets, including Pomako Village, Tipuka Village, Hiripau Village, Kaugapu Village, Wania Village, and Mware Village. With a land area of 1,789 km². The administrative boundaries of East Mimika District are as follows:

- a. To the north, it borders the Wania District;
- b. To the south, it borders the Arafura Sea;
- c. To the west, it borders the Mimika Tengah District;
- d. To the east, it borders the Mimika Timur Jauh District. The area of the Mimika Timur District is 3.91 km² of the total Mimika Regency, which has 12 districts or sub-districts. In the Mimika Timur District, the most significant area is Pomako Village, which has an area of 2,237 km², while the smallest area is Wania Village, which has 215 km².

4.3. Overview of Pomako Village

Pomako Village is one of the six villages in the East Mimika sub-district. The geographical conditions of Pomako Village, whose capital is Wania Village, which is located in the north of the capital of East Mimika Sub-district, and part of the land area with an area of 2,237 km², with a distance from the district capital of 36 km, with the following regional boundaries.

- a. To the north, it borders Wania Village, the capital of East Mimika District;
- b. To the east, it borders the Mimika Timur Jauh District;
- c. To the south, it borders the Arafura Sea;
- d. To the west, it borders Ndapurutiri Village, Central Mimika District.

4.4. Land Arrangement in the City Area on the Banks of the Wania River

The General Urban Spatial Plan is the integrated and coordinated planning of a city's land/space, incorporating human and natural resources. This planning requires harmonious development and construction between buildings' built/physical spaces and the environment, creating a dynamic and planned environmental system. Land use is one of the mandates of the Spatial Planning Law to be developed through a Government Regulation, together with Water Use and Air Use. Land use, Airspace Use, and Sea Use must all refer to the provisions of the Spatial Planning Law.

Urban land planning aims to organize a city's space so that planned spatial interactions occur. The regulated matters are Land Consolidation and the Provision of Urban Facilities and Infrastructure. Land consolidation aims to optimize land use and utilization, increase productivity, and conserve environmental sustainability, in addition to more planned and controlled city development. Meanwhile, providing urban facilities and infrastructure is one of the elements planned for use to benefit city development. All city development procedures and activities relating to land use are based on Presidential Decree No. 55 of 1993 and Presidential Decree No. 97 of 1993, the implementation of which refers to the applicable spatial plan that has been ratified as a regional regulation by the Regional People's Representative Council (DPRD).

The Urban Spatial Plan for the Wania Riverbanks in Asmat Poumako Village, Timika, Papua, is a plan that serves as a guideline for land use (space) in a specific area. This guideline is necessary to ensure that land use (space) benefits the community and avoids detrimental impacts on various parties. The Land Arrangement of the City Area on the Wania Riverbanks is based on the results of research conducted by researchers, which will be used as a comparison to determine the components to be implemented on the Wania Riverbanks in Mimika City, East Mimika District. The research was conducted for approximately one month at the location, prioritizing the use of local natural and human resources and implementing sustainable development. To arrive at a mature plan for the development of land use, among other things:

- a. Integration between agencies, and we need to realize that for too long we have been talking sectorally, which has always been detrimental to development.
- b. Various obstacles that must be overcome such as the uneven distribution of population throughout Indonesia, especially in certain islands, so that it is impossible to apply uniform land use, on the contrary, the development of cities due to urbanization, either because of the lack

of employment opportunities in Indonesia, better social facilities in cities, urban settlement planning that does not refer to restrictions on housing development; in this case we see recently the increasing number of shophouses or rutor houses that always encourage urbanization, which I often call pigeon hole buildings. Security and tranquility have been disturbed in rural areas, and educational facilities are not evenly distributed throughout Indonesia, especially universities.

- c. Various legal products that examine different objects have different solutions.
- d. There is no comprehensive list of all existing assets, such as land rights, types of rights, and the land's capacity and use, which is still not orderly. Land use remains irregular, with industry presence in residential areas, and so on.
- e. The relationship between taxation and settlements that have not been well developed, on the one hand, taxation tries to get as much tax as possible, on the other hand, middle and lower class people cannot pay the tax as a result of inflation and the decline in the value of the money they receive.
- f. Industrial development that uses fertile agricultural land and disrupts national food self-sufficiency, including, in this case, the tourism industry and luxury housing that uses land that should be used as water reservoirs and as water absorption areas.

4.5. Implementation of Urban Spatial Planning on the Wania Riverbanks

Monitoring the implementation of urban spatial planning on the banks of the Wania River in the Asmat Poumako Village in Timika, Papua, is inseparable from various influencing factors. From the perspective of George Edward III's theory, several factors influence the process of policy implementation, namely:

- a. Communication
Clarity in communication plays a crucial role in the success of a policy. Communication is also a means of disseminating information from the top down and vice versa. Therefore, the policy will not be implemented optimally when communication limitations occur during program implementation. George Edward III also stated that effective communication requires implementers to know what they are doing, policy decisions must be transmitted to the right people, and the communication process must be clearly understood (clarity). Furthermore, policy instructions must be implemented consistently (consistency).
- b. Resources
Internal resources play a crucial role in policy implementation. Policy implementation will be ineffective without adequate resources if the supporting resources are insufficient.
- c. Disposition
Another factor that can influence the effectiveness of policy implementation is the attitude of the implementers in synergy with other agencies to avoid misunderstandings regarding the implementation. Furthermore, to determine the attitude of the implementers of the Wania River policy in Asmat Poumako Village, Timika, Papua, this study analyzes the program implementers' ability to address the obstacles that arise.

Based on the results of interviews conducted by researchers, several obstacles occurred in the implementation of the Wania Riverbanks in Asmat Poumako Village, including those related to the large number of agencies involved during the policy planning and implementation process, and regarding land management rights in the area around the Wania Riverbanks.

4.6. Theoretical Review on Spatial Planning Implementation

Analysis of urban spatial planning implementation in the Wania Riverbank Area, Asmat Paumako Village, needs to be understood within the framework of policy implementation theory proposed by George Edward III, which emphasizes three main factors for successful implementation, namely communication, resources, and implementer disposition (Hammar, 2008). In the context of this research, ineffective communication between local governments, village officials, and indigenous communities causes a lack of understanding and coordination in spatial planning implementation, in accordance with findings that indicate obstacles in aligning formal policies with the prevailing customary land management system. Furthermore, as explained in the theory, limited financial and technical resources are a significant obstacle impacting the ability to conduct adequate supervision, monitoring, and enforcement of regulations in the field. This aligns with empirical findings showing weak oversight and a mismatch between field practices and the Detailed Spatial Planning Plan (RDTR), resulting in inappropriate use of space and creating ecological and social risks.

The disposition or attitude of policy implementers is also a crucial factor, as social resistance from indigenous communities to formal regulations is driven by the paradigm differences between customary law and state spatial planning policies (Simanjuntak, 2017). A participatory approach inspired by the theory of local wisdom integration emphasizes the need to actively involve indigenous communities in the spatial planning and implementation process to ensure that the resulting policies are more inclusive and adaptive to local characteristics (Bina et al., 2018). Furthermore, this analysis confirms findings from riverbank spatial planning studies in other regions, which indicate that alignment of spatial use with spatial plans contributes to the success of sustainable area management (Sidabutar & Sugiarto, 2025). Studies in Sentani and Merauke indicate that regular monitoring, community participation, and consistent law enforcement are key supporting factors in overcoming spatial planning implementation challenges, while also providing an important basis for policy recommendations in the Wania Riverbank Area (Spatial Utilization Suitability Analysis, 2025). Thus, the results of this study not only demonstrate technical and structural barriers but also emphasize the importance of integrating policy implementation theory with an understanding of local wisdom as a key strategy in increasing the effectiveness of sustainable urban spatial planning in areas with socio-cultural and ecological diversity, such as the Asmat Paumako Village.

4.7. Constraints and Urgency Based on Urban Planning Theory

The findings of this study reveal several major obstacles in implementing urban spatial planning in the Wania Riverbank Area, including minimal cross-sectoral coordination, limited resources, and differences in paradigms between the formal legal system and the local wisdom of indigenous communities. This condition results in a mismatch between spatial use and the Detailed Spatial Plan (RDTR), which can potentially reduce the ecological function of the riverbank and give rise to social conflict. These obstacles reflect the complex realities often encountered in managing ecologically and socio-culturally sensitive urban areas, as emphasized in George Edward III's policy implementation theory (Hammar, 2008) and local wisdom studies (Simanjuntak, 2017). Theoretically, this research is important because it broadens the understanding of urban planning, which focuses on physical and technical aspects and must also accommodate socio-cultural dynamics and human interactions with the environment. Modern urban planning theory emphasizes that effective planning integrates multidisciplinary approaches, including spatial, social, economic, and environmental planning, and upholds community participation as the leading actor in the urban development (Healey, 1997; Innes & Booher, 2010).

The importance of this research can also be seen from the perspective of sustainable planning theory, which emphasizes that urban spatial planning must maintain a balance between physical development and environmental preservation, while also addressing social justice through the inclusion of diverse community interests, including indigenous communities (Campbell, 1996). This study reinforces this notion by demonstrating that the disharmony between formal policies and local practices can potentially disrupt the

ecological and social sustainability of riverbank areas in Timika. Furthermore, this research provides a relevant empirical contribution to urban area management in regions with unique geographic and cultural characteristics, such as Papua, where pluralistic legal systems are vital elements in planning (Sandercock, 1998). Recognition of customary legal systems and utilizing local wisdom are key strategies for bridging the gap between state regulations and community needs, making urban planning more adaptive and responsive to specific contexts.

Therefore, the results of this study reaffirm that effective urban spatial planning must be participatory, adaptive, and multisectoral, with good synergy between the government, indigenous communities, and other stakeholders. This approach not only strengthens the effectiveness of policy implementation but also enhances urban development's social legitimacy and sustainability. Therefore, this study provides an important foundation for formulating spatial planning policies in similar areas facing complex ecological and sociocultural challenges.

4.8. Potential Impacts on Community Development and Environmental Sustainability

This research has significant strategic implications for community development and environmental sustainability management. Socially, the research findings emphasize the importance of a participatory approach that integrates the local wisdom of indigenous communities in spatial planning decision-making. This aligns with research (Bina et al., 2018), which shows that involving indigenous communities through participatory mapping increases policy legitimacy while strengthening social and cultural ties that form the foundation of sustainable natural resource management in Papua. This approach helps overcome social resistance to formal regulations. It opens up space for dialogue between the government and indigenous communities, thereby minimizing the social conflicts that often arise from differences in spatial planning paradigms. Thus, this research strengthens the position of the inclusive and participatory planning theory popularized by Healey (1997), which believes that sustainable urban development can only be achieved if local communities are actively involved in the spatial planning and management process.

From an environmental sustainability perspective, the research highlights the potential for ecological damage due to inappropriate spatial planning practices along riverbanks, which, if not addressed, could lead to flooding, habitat degradation, and a decline in the community's quality of life. This aligns with findings by Merritt et al. (2010) and Nasution & Simatupang (2015) that incorrect spatial planning in riverbank areas increases the risk of natural disasters and threatens the river's ecological function as a vital hydrological system. Therefore, strengthening ecologically sound spatial planning, complemented by effective government oversight with the support of local communities, is key to ensuring environmental sustainability in the region. Compared with research by Sidabutar & Sugiarto (2025), which discussed the dynamics of riverbank management in Pematang Siantar, there are similar challenges, namely the need for more inclusive spatial management and strengthening ecological functions through participatory oversight. However, the socio-cultural context in Asmat Paumako, which prioritizes customary law systems, demands a more adaptive and culturally sensitive approach than other urban areas that may be more socially homogeneous. This places this research in a unique position to enrich the discourse on legal pluralism and spatial planning, strengthening the argument (Sandercock, 1998) regarding the importance of integrating customary law in urban planning in multicultural and pluralistic areas. This discourse emphasizes that the success of spatial management in riverbank areas depends not only on technical aspects or formal regulations but is also greatly influenced by socio-cultural dynamics. This study opens up a broader understanding that sustainable urban development requires synergy across sectors and knowledge, particularly between spatial planning, ecology, social anthropology, and customary law. Therefore, the results of this study have strategic value in shaping more inclusive, responsive, and sustainable policies, which are relevant to the Asmat Paumako Village and can serve as a model for other areas with similar socio-ecological characteristics.

V. Conclusion

Based on the research results presented, it can be concluded that this study reveals that the implementation of urban spatial planning in the Wania Riverbank area in the Asmat Paumako Village faces various significant challenges that impact the effectiveness of spatial management and the environmental and social sustainability of the local community. Based on descriptive qualitative analysis, the main factors that become obstacles in the implementation of spatial planning include weak communication and coordination between government agencies, limited resources, both technical and financial, and differences in paradigms between customary law adhered to by the Asmat community and formal regulations implemented by the local government. The inconsistency between daily space utilization practices and the Detailed Spatial Planning Plan (RDTR) provisions strongly indicates suboptimal supervision and implementation of spatial planning policies. This condition can cause ecological damage such as degradation of riverbank habitats, increased flood risks, and social conflict due to conflicting spatial interests between economic development and environmental conservation. These findings strengthen the argument of the policy implementation theory by George Edward III, who emphasizes the importance of clear communication, resource availability, and a synergistic attitude of implementers as the keys to successful implementation (Hammar, 2008).

Furthermore, this study emphasizes the importance of recognizing and integrating the local wisdom of the Asmat indigenous community into spatial planning and management. The customary legal system and land management mechanisms currently in place in the Asmat Paumako Village differ from formal regulations, necessitating a participatory and inclusive approach to ensure spatial planning policies are accepted and effectively implemented. This aligns with sustainable urban planning theory studies, emphasizing the need to harmonize physical development, social justice, and environmental conservation (Campbell, 1996; Simanjuntak, 2017). This study also provides an important contribution to spatial management in regions with complex geographic and socio-cultural characteristics, such as Papua, by emphasizing that the success of urban development depends on technical regulations and the integration of local socio-cultural values and norms. Therefore, this study recommends developing a spatial planning model that prioritizes multi-sectoral collaboration, strengthens resource capacity, and employs a participatory approach based on local wisdom to achieve sustainable and inclusive urban planning.

Overall, the results of this study open new perspectives in urban spatial planning and implementation in riverbank areas, strengthening the argument that successful spatial policy implementation can only be achieved through a holistic understanding that combines technical, social, cultural, and ecological aspects simultaneously. This research provides an important empirical and conceptual basis for decision-making by local governments and stakeholders in realizing harmonious development between community needs and environmental sustainability in Timika, in particular, and the Papua region in general. Further research is recommended to develop a more integrative and participatory spatial planning implementation model that systematically combines formal government policies with the local wisdom of indigenous communities. This approach will help improve the effectiveness of spatial management and the sustainability of development in riverbank areas, which are socio-culturally and ecologically unique. Furthermore, a comparative study of various riverbank areas in Papua can provide broader insights into the diversity of challenges and best practices, thus making the resulting policy recommendations more contextual and applicable. Longitudinal research is also important to monitor the long-term impacts of spatial planning implementation on community social conditions and environmental sustainability, including changes in spatial use patterns and ecosystem quality in the region. Furthermore, technologies such as Geographic Information Systems (GIS) and digital-based participatory mapping can be further studied as planning and monitoring tools involving collaboration between indigenous communities and local governments. Finally, interdisciplinary research that examines the interaction between customary and state legal systems in the context of spatial planning is essential to develop a framework for legal pluralism that can be practically applied in areas with high socio-cultural diversity, such as the Asmat Paumako Village. Through these various efforts, it is hoped that spatial

planning management can become more inclusive, adaptive, and sustainable, while strengthening environmental conservation and empowering indigenous communities in Papua.

References

- Arifin, B. (2016). *Regional spatial planning and management*. Yogyakarta: ANDI Publisher.
- Badan Perencanaan Pembangunan Nasional (Bappenas). (2015). *National medium-term development plan 2015–2019*. Jakarta: Bappenas.
- Bina, O. K., Simanjuntak, D., & Sidabutar, R. (2018). Integration of participatory mapping of indigenous communities in spatial planning in Papua. *Journal of Regional and Urban Planning*, 29(2), 103–117.
- Bina, R., Siregar, R., & Wulandari, M. (2018). Integration of participatory mapping of indigenous communities in spatial planning in Papua. *Journal of Spatial Planning and Culture*, 4(1), 23–35.
- Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2), 27–40.
- Campbell, S. (1996). Green cities, growing cities, just cities? Urban planning and the contradictions of sustainable development. *Journal of the American Planning Association*, 62(3), 296–312.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: SAGE Publications.
- Damanik, E. (2019). Obstacles in the implementation of spatial planning in urban areas. *Indonesian Journal of Spatial Planning*, 14(2), 123–134.
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (2011). *The SAGE handbook of qualitative research* (4th ed.). Thousand Oaks, CA: SAGE Publications.
- Fauzi, M. (2020). Riverbank management for urban flood control. *Journal of the Environment*, 7(1), 45–57.
- Firman, T. (2009). Urban development in Indonesia: Challenges and opportunities. *International Journal of Urban and Regional Research*, 33(4), 914–927.
- Hammar, R. K. R. (2008). Inconsistency in the implementation of spatial planning. *Patriot Journal, College of Law (Bintuni)*, 1(1).
- Hammar, R. K. R. (2008). *Land use planning and regional development in Indonesia*. Jakarta: LP3ES.
- Healey, P. (1997). *Collaborative planning: Shaping places in fragmented societies*. London: Macmillan.
- Hidayat, D. (2016). Analysis of spatial planning policies in Mimika Regency. *Journal of Regional Planning*, 3(1), 33–44.
- Hermawan, A. (2021). The impact of urbanization on environmental quality in urban areas of Papua. *Journal of Social Ecology*, 5(2), 112–123.
- Jayadinata, J. T. (1999). *Land use in rural, urban, and regional planning* (3rd ed.). Bandung: ITB.
- Kuncoro, M. (2013). *Sustainable economic development in Indonesia*. Yogyakarta: UGM Press.
- Margaret, S. (2018). Socio-economic changes in Timika: Impact of the mining industry. *Papua Journal of Social Sciences*, 10(1), 55–67.
- Marshall, C., & Rossman, G. B. (2016). *Designing qualitative research* (6th ed.). Thousand Oaks, CA: SAGE Publications.
- Merritt, D. M., Scott, M. L., Poff, N. L., Auble, G. T., & Lytle, D. A. (2010). Riparian ecosystems and biodiversity conservation: Global implications. *Ecological Applications*, 20(5), 1327–1342.
- Meyer, E. (2011). Challenges in urban planning in developing countries: Case studies from Southeast Asia. *Habitat International*, 35(3), 408–416.
- Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Thousand Oaks, CA: SAGE Publications.
- Moleong, L. J. (2017). *Qualitative research methodology* (Rev. ed.). Bandung: Remaja Rosdakarya.
- Nasution, Z., & Simatupang, T. (2015). *Planning of parks and green open spaces in urban areas*. Jakarta: Erlangga.
- Permana, F. (2023). Community participation in urban spatial management. *Journal of Urban Planning*, 11(1), 55–70.

- Sandercock, L. (1998). *Towards Cosmopolis: Planning for multicultural cities*. Oxford: Wiley.
- Sari, P., Nugroho, A., & Putra, D. (2019). Urban flooding and land use changes along riverbanks in Indonesia's cities. *Journal of Geography*, 11(2), 101–111.
- Sidabutar, A. R., & Sugiarto, E. (2025). Management of riverbank areas in Pematang Siantar City. *Journal of Spatial Planning and Environment*, 9(1), 14–28.
- Simanjuntak, R. (2017). Legal pluralism in the spatial planning of Papuan indigenous communities. *Journal of Law and Society*, 20(2), 89–102.
- Sutaryono, Y., Riyadi, & Widiyantoro. (2020). *Spatial planning and regional planning implementation in land policy*. Yogyakarta: STPN Press.
- Sutaryono, Y., Prabowo, D., & Hartati, E. (2020). *Urban and regional planning in Indonesia: Perspectives and practices*. Malang: UB Press.
- Sutaryo, D. (2017). *Management of natural resources and the environment in the context of development*. Jakarta: Rajawali Pers.
- Undang-Undang Nomor 17 Tahun 2007 tentang Rencana Pembangunan Jangka Panjang Nasional 2005–2025. (2007). Jakarta: Sekretariat Negara.
- Utomo, P. (2018). The role of indigenous communities in spatial planning. *Journal of Regional Studies*, 9(1), 70–81.
- Wandira, D. (2019). Community participation in riverbank management. *Wetland Journal*, 4(1), 34–46.
- Wilman, J. (2020). Spatial constellation in the Timika riverbank area. *Papua Urban Journal*, 2(1), 25–38.
- Yulianto, B., & Syahputra, W. (2017). Inter-agency coordination in the implementation of spatial planning policies. *Journal of Public Policy*, 8(2), 101–113.