

COMPARATIVE ANALYSIS OF GREEN URBAN SPATIAL PLANNING POLICIES IN INDONESIA AND MALAYSIA: IMPLICATIONS FOR SUSTAINABLE ENVIRONMENTAL GOVERNANCE

Otom Mustomi¹, Hamdan Azhar Siregar², Farhana ³, Mardani⁴, Endang Sutrisno⁵

¹⁻⁴ Universitas Islam Jakarta, Indonesia

⁵ Universitas Swadaya Gunung Jati, Indonesia

Email: otommustomi@gmail.com, hamdan_sir@yahoo.co.id, frh961@gmail.com,
mardaniachlan@gmail.com, endang_sutrisno@ugj.ac.id

Abstrak: Rapid urbanization in Southeast Asia has intensified environmental degradation, including declining green spaces, increased pollution, and ecological imbalance. Urban spatial planning plays a crucial role in addressing these challenges by integrating environmental sustainability principles into land use regulation and development control. This study aims to comparatively analyze green urban spatial planning policies in Indonesia and Malaysia and examine their implications for sustainable environmental governance. This research employs a qualitative comparative approach using policy analysis of spatial planning regulations, national development frameworks, and environmental planning strategies in both countries. The findings indicate that both Indonesia and Malaysia have incorporated environmental sustainability into their spatial planning frameworks; however, differences exist in policy structure, institutional coordination, and implementation effectiveness. Malaysia demonstrates a more centralized and integrated planning system with stronger policy alignment between national and local levels, while Indonesia's decentralized system provides flexibility but faces challenges in enforcement and coordination. Furthermore, the effectiveness of green spatial planning policies significantly influences environmental governance outcomes, particularly in promoting sustainable land use, protecting green infrastructure, and enhancing urban environmental resilience. This study contributes to the literature by providing a comparative perspective on spatial planning policies and highlighting the importance of institutional strength, regulatory coherence, and implementation capacity in achieving environmentally sustainable urban development. The findings offer important policy insights for improving green urban governance in rapidly growing cities.

Key Words: Green Urban Spatial Planning, Environmental Governance, Spatial Planning Policy, Sustainable Urban Development.

INTRODUCTION

Rapid urbanization has become one of the most significant drivers of environmental transformation in developing countries, particularly in Southeast Asia. Urban expansion, population growth, and infrastructure development have intensified environmental pressures,

including land degradation, reduction of green open spaces, increased pollution, and ecosystem imbalance. Urban spatial planning has therefore emerged as a critical instrument to regulate land use, manage environmental resources, and promote sustainable urban development. Sustainable urban planning integrates environmental considerations into spatial governance frameworks to ensure that urban growth does not compromise ecological integrity and long-term environmental sustainability (Abdul & Hameed, 2021). Moreover, the concept of urban sustainability emphasizes the integration of environmental protection, economic development, and social well-being within urban planning systems to achieve balanced and resilient cities (Anthony et al., 2018).

In this context, green urban spatial planning has become a strategic approach to mitigate environmental degradation and enhance urban environmental governance. Green spatial planning promotes the integration of green infrastructure, sustainable land use management, and environmental protection into urban development policies. Effective spatial planning policies contribute significantly to reducing environmental risks, improving ecosystem resilience, and ensuring sustainable urban growth (Simamora & Sarjono, 2022). In Indonesia, spatial planning plays a fundamental role in regulating land allocation, controlling development patterns, and protecting environmental resources. However, rapid urban expansion and inconsistent implementation of spatial planning policies have resulted in environmental challenges, including land use incompatibility, reduction of green open spaces, and increased vulnerability to environmental hazards (Septiana et al., 2020; Savitri & Fransiska, 2022). These challenges indicate that spatial planning effectiveness is closely related to environmental governance capacity and institutional coordination.

Similarly, Malaysia has also experienced rapid urban growth, which has significantly influenced land use patterns, urban density, and environmental sustainability. Urban expansion beyond core metropolitan areas has contributed to environmental stress and increased demand for sustainable spatial planning systems (Samat et al., 2019). Malaysia has adopted various spatial planning frameworks, including compact city principles and transit-oriented development, to enhance land use efficiency and environmental sustainability (Azmi et al., 2021; Ramlan et al., 2021). These planning approaches aim to optimize land use, reduce environmental degradation, and promote environmentally sustainable urban development. The integration of environmental considerations into spatial planning policies reflects the growing importance of environmental governance in managing urban sustainability challenges.

Recent studies have highlighted the critical role of spatial planning in promoting sustainable urban development and environmental protection. Abdul and Hameed (2021) emphasized that green city policies contribute significantly to sustainable urban systems by integrating environmental sustainability principles into urban planning frameworks. Similarly, Astuti et al. (2024) demonstrated that intelligent city and digital transformation approaches can enhance environmental management efficiency and support sustainable urban governance. Furthermore, Simamora and Sarjono (2022) highlighted the importance of spatial planning regulations in achieving sustainable development goals, particularly in controlling land use and ensuring environmental protection. In the Malaysian context, Azmi et al. (2021) and Ramlan et al. (2021) found that compact city planning and integrated land use policies improve environmental sustainability and urban efficiency by optimizing spatial organization and reducing environmental pressure.

Despite these important contributions, several research gaps remain. First, most

existing studies focus primarily on spatial planning implementation within a single national context, without providing comparative analysis between countries with similar regional characteristics. Second, previous research has emphasized technical, regulatory, or implementation aspects of spatial planning, but has not sufficiently examined the implications of spatial planning policies for environmental governance effectiveness. Third, limited studies have comparatively analyzed how different spatial planning policy frameworks influence environmental sustainability outcomes in Southeast Asian countries, particularly between Indonesia and Malaysia. Comparative analysis is essential to identify policy strengths, institutional capacity differences, and best practices that can enhance sustainable environmental governance.

This study addresses these gaps by conducting a comparative analysis of green urban spatial planning policies in Indonesia and Malaysia, focusing on their implications for environmental governance and sustainable urban development. This research offers a novel contribution by integrating spatial planning policy analysis with environmental governance perspectives to evaluate the effectiveness, institutional structure, and sustainability implications of green urban planning frameworks in both countries. Unlike previous studies that focus on single-country analysis or technical planning aspects, this research provides a cross-national comparative evaluation that highlights policy coherence, implementation effectiveness, and governance capacity in achieving environmentally sustainable cities.

The objective of this study is to comparatively analyze green urban spatial planning policies in Indonesia and Malaysia and examine their implications for sustainable environmental governance. Specifically, this research aims to (1) evaluate the policy framework of green urban spatial planning in both countries, (2) analyze the effectiveness of policy implementation in promoting environmental sustainability, and (3) assess the implications of spatial planning policies for strengthening environmental governance. The findings of this study are expected to contribute to the development of more effective spatial planning policies and provide strategic insights for improving sustainable urban governance in rapidly urbanizing regions.

RESEARCH METHODS

This study employs a qualitative comparative research design to analyze and evaluate green urban spatial planning policies in Indonesia and Malaysia and their implications for sustainable environmental governance. The qualitative comparative approach was selected because it enables an in-depth examination of policy frameworks, institutional arrangements, and implementation practices across different national contexts. Comparative policy analysis is particularly appropriate for identifying similarities, differences, strengths, and weaknesses in spatial planning systems and their effectiveness in promoting environmental sustainability. This approach also facilitates the exploration of governance structures and regulatory mechanisms that influence environmental outcomes within urban spatial planning systems.

The study focuses on spatial planning policies, regulatory frameworks, and planning implementation strategies that incorporate environmental sustainability principles in urban development. Indonesia and Malaysia were selected as case study countries due to their similar regional characteristics, rapid urbanization, and shared commitment to sustainable urban development, while also possessing distinct spatial planning governance structures. Indonesia implements a decentralized spatial planning system involving national, provincial,

and local governments, whereas Malaysia adopts a more centralized and coordinated planning approach. This contrast provides an appropriate basis for comparative analysis of environmental governance effectiveness.

Data used in this study were collected through a document-based research method, focusing on secondary data obtained from official policy documents, government regulations, spatial planning frameworks, and academic literature. Key documents analyzed include spatial planning regulations, urban development policies, environmental governance frameworks, and green city planning strategies in both countries. In addition, relevant academic journal articles, policy reports, and institutional publications published within the last five years were reviewed to ensure the relevance and accuracy of the analysis. Document analysis is an effective method for examining policy intent, regulatory structure, and governance mechanisms related to environmental spatial planning (Azmi et al., 2021; Ramlan et al., 2021).

The data analysis process was conducted using qualitative thematic analysis combined with comparative analytical techniques (Ratnaningtyas et al., 2023). First, relevant policy documents and literature were systematically reviewed to identify key themes related to green spatial planning, environmental sustainability, policy structure, and governance mechanisms. Second, the identified themes were categorized into analytical components, including policy framework, implementation effectiveness, and environmental governance implications. Third, a comparative analysis was conducted to examine similarities and differences between Indonesia and Malaysia in terms of policy orientation, institutional coordination, regulatory integration, and environmental sustainability outcomes. This analytical process enabled the identification of key policy strengths, governance challenges, and areas for improvement in each country's spatial planning system.

To enhance the validity and reliability of the findings, this study employed data triangulation by comparing multiple data sources, including government regulations, policy documents, and academic literature. This triangulation process ensured the consistency and credibility of the analysis and strengthened the robustness of the comparative evaluation. Through this methodological approach, the study provides a comprehensive and systematic analysis of green urban spatial planning policies and their implications for sustainable environmental governance in Indonesia and Malaysia.

RESULTS AND DISCUSSION

Policy Framework of Green Urban Spatial Planning in Indonesia and Malaysia

The policy framework of green urban spatial planning plays a fundamental role in guiding sustainable urban development and ensuring environmental protection through regulatory and institutional mechanisms. Green urban spatial planning integrates ecological considerations into land use management, infrastructure development, and urban governance to promote environmental sustainability and resilience. Sustainable spatial planning policies aim to balance urban growth with ecological preservation, ensuring that environmental resources, green open spaces, and ecosystem services are maintained within urban environments (Abdul & Hameed, 2021; Anthony et al., 2018). Both Indonesia and Malaysia have developed spatial planning frameworks that incorporate environmental sustainability principles, although their institutional structures, regulatory approaches, and implementation mechanisms differ significantly due to variations in governance systems and policy

coordination.

In Indonesia, the spatial planning policy framework is primarily regulated under Law Number 26 of 2007 on Spatial Planning, which provides the legal foundation for the regulation, utilization, and control of spatial development at national, provincial, and local levels (Pemerintah Republik Indonesia, 2007). This law emphasizes the integration of environmental sustainability principles into spatial planning to ensure ecological balance and sustainable urban development. The law establishes spatial planning instruments such as the National Spatial Plan (RTRWN), Provincial Spatial Plan (RTRWP), and Local Spatial Plan (RTRWK), which function as regulatory tools to control land use and guide urban development. These spatial planning instruments are designed to ensure environmental protection, prevent uncontrolled urban expansion, and maintain ecological functions within urban areas. The importance of spatial planning regulations in promoting sustainable development has been highlighted by Simamora and Sarjono (2022), who emphasized that spatial planning policies serve as essential instruments for regulating land use, protecting environmental resources, and ensuring sustainable urban governance.

Indonesia's spatial planning framework also incorporates environmental considerations through the allocation and protection of green open spaces (Ruang Terbuka Hijau), which are essential for maintaining ecological balance and improving urban environmental quality. Green open spaces play a critical role in mitigating urban heat, reducing pollution, and enhancing urban ecological resilience (Dwiyanto, 2009; Supratiwi, 2018). However, rapid urban development and population growth have significantly reduced green open spaces in major Indonesian cities, indicating challenges in spatial planning implementation and environmental protection (Budiman et al., 2014). Furthermore, land use changes and urban expansion have contributed to environmental problems such as increased flood risks and hydrological imbalance, highlighting the importance of effective spatial planning policies in managing environmental sustainability (Septiana et al., 2020; Dahlia et al., 2018). These findings demonstrate that although Indonesia has established a comprehensive regulatory framework for spatial planning, the effectiveness of policy implementation remains influenced by institutional coordination, enforcement capacity, and local governance structures.

Indonesia's spatial planning policy framework is characterized by a decentralized governance system, in which local governments play a significant role in spatial planning implementation. Decentralization allows local governments to develop spatial plans that reflect regional characteristics and environmental conditions. However, decentralization also presents challenges in policy consistency, coordination, and enforcement, which can affect the effectiveness of environmental governance (Rukmana, 2015). In many cases, inconsistencies between spatial plans and actual land use practices have been observed, reflecting gaps between policy formulation and implementation (Savitri & Fransiska, 2022). These challenges highlight the need for stronger institutional coordination and regulatory enforcement to ensure that spatial planning policies effectively promote environmental sustainability and green urban development.

In contrast, Malaysia's spatial planning policy framework demonstrates a more centralized and integrated approach, supported by national-level planning coordination and structured policy implementation. Malaysia has adopted comprehensive spatial planning strategies that integrate sustainable development principles, compact city planning, and

transit-oriented development to promote efficient land use and environmental sustainability. Compact city policies emphasize higher density development, mixed land use, and efficient transportation systems, which contribute to reducing environmental impacts and enhancing urban sustainability (Azmi et al., 2021; Ramlan et al., 2021). These planning strategies support the development of environmentally sustainable urban environments by minimizing urban sprawl, reducing carbon emissions, and optimizing land use efficiency.

Malaysia's spatial planning framework also incorporates environmental sustainability through coordinated policy implementation at national, regional, and local levels. The integration of environmental considerations into spatial planning policies helps ensure sustainable land use management and environmental protection. Urban planning policies in Malaysia have been designed to address environmental challenges associated with rapid urbanization, including land use change, environmental degradation, and infrastructure development pressures (Samat et al., 2019). In addition, policy coordination mechanisms in Malaysia facilitate consistent implementation of spatial planning policies, enhancing governance effectiveness and environmental sustainability outcomes.

Another important aspect of Malaysia's spatial planning framework is the integration of economic and environmental planning through property and land management policies. Effective land management policies support sustainable urban development by regulating land use, controlling development intensity, and promoting environmentally responsible urban growth (Abd Rahman et al., 2021). This integrated policy approach strengthens environmental governance by aligning spatial planning objectives with economic and environmental sustainability goals. Furthermore, Malaysia has implemented various green city initiatives and sustainable urban planning strategies to enhance environmental quality and urban resilience, reflecting a strong policy commitment to sustainable development.

Comparatively, both Indonesia and Malaysia have established spatial planning policy frameworks that incorporate environmental sustainability principles; however, their governance approaches and policy effectiveness differ. Indonesia's decentralized planning system provides flexibility and local autonomy but faces challenges related to policy consistency, coordination, and enforcement. In contrast, Malaysia's centralized and coordinated planning system facilitates more consistent policy implementation and stronger institutional integration, contributing to more effective environmental governance. These differences reflect the influence of governance structure, institutional capacity, and policy coordination on the effectiveness of spatial planning frameworks in promoting green urban development.

The policy frameworks of green urban spatial planning in Indonesia and Malaysia demonstrate a strong commitment to integrating environmental sustainability into urban development. However, the effectiveness of these frameworks depends not only on regulatory design but also on institutional coordination, governance capacity, and implementation effectiveness. Strengthening policy integration, improving regulatory enforcement, and enhancing institutional coordination are essential to ensuring that spatial planning policies effectively support sustainable environmental governance and promote environmentally sustainable urban development in both countries.

Implementation Effectiveness of Green Spatial Planning Policies

The effectiveness of green spatial planning policies depends not only on the existence

of regulatory frameworks but also on the capacity of institutions, enforcement mechanisms, and coordination among stakeholders to ensure proper implementation. Green spatial planning is designed to regulate land use, preserve ecological functions, and promote environmentally sustainable urban development. However, the success of such policies is influenced by governance quality, policy enforcement, public participation, and institutional coordination. Effective implementation ensures that spatial planning policies translate into tangible environmental benefits, including improved environmental quality, preservation of green open spaces, and reduced ecological degradation (Abdul & Hameed, 2021; Anthony et al., 2018). In both Indonesia and Malaysia, green spatial planning policies have been formally established, but their implementation effectiveness varies due to differences in governance systems, institutional capacity, and regulatory enforcement.

In Indonesia, the implementation of green spatial planning policies is guided by Law Number 26 of 2007 on Spatial Planning, which mandates the integration of environmental sustainability into spatial planning at national and local levels (Pemerintah Republik Indonesia, 2007). This law provides a legal framework for controlling land use, protecting ecological areas, and ensuring sustainable development. However, despite the existence of regulatory frameworks, implementation challenges persist due to inconsistencies between spatial planning policies and actual land use practices. One major issue is the continued conversion of green open spaces into urban development areas, which undermines ecological sustainability and increases environmental risks. Studies have shown that urban expansion in major Indonesian cities has significantly reduced green open spaces, weakening ecological resilience and increasing vulnerability to environmental hazards (Budiman et al., 2014; Dwiyanto, 2009).

Furthermore, land use changes and urban expansion have significantly impacted environmental sustainability, particularly in urban hydrological systems. Changes in land cover due to uncontrolled urban development have contributed to increased flooding risks, environmental degradation, and disruption of natural ecological functions (Septiana et al., 2020; Dahlia et al., 2018). These findings indicate that although spatial planning policies formally incorporate environmental sustainability principles, their implementation effectiveness remains limited due to weak enforcement and insufficient monitoring mechanisms. Simamora and Sarjono (2022) emphasized that regulatory frameworks alone are insufficient to ensure sustainable urban development unless supported by effective enforcement, institutional capacity, and governance coordination.

Another critical factor influencing the effectiveness of green spatial planning implementation in Indonesia is institutional coordination and governance decentralization. Indonesia's decentralized governance system allows local governments to develop and implement spatial planning policies based on regional needs and characteristics. While decentralization promotes local autonomy, it also creates challenges related to policy consistency, coordination, and enforcement across different administrative levels. Rukmana (2015) highlighted that spatial planning implementation in Indonesia is often affected by institutional fragmentation and lack of coordination between national and local authorities. This fragmentation weakens policy effectiveness and creates opportunities for land use deviations that undermine environmental sustainability goals. Additionally, Savitri and Fransiska (2022) found inconsistencies between spatial planning regulations and actual land use practices, indicating gaps between policy formulation and implementation.

Public participation and stakeholder engagement also play a critical role in enhancing the effectiveness of spatial planning implementation. Community involvement in spatial planning processes can improve policy compliance, enhance environmental awareness, and support sustainable urban development. Adiyanta (2018) emphasized that public participation strengthens the effectiveness of spatial planning policies by ensuring transparency, accountability, and responsiveness to local environmental needs. However, limited public awareness and insufficient stakeholder involvement often reduce the effectiveness of spatial planning implementation, particularly in rapidly urbanizing areas where development pressures are high.

In contrast, Malaysia demonstrates relatively stronger implementation effectiveness due to its more centralized and coordinated spatial planning system. Malaysia has adopted compact city planning, transit-oriented development, and integrated land use planning to enhance environmental sustainability and urban efficiency. These policies promote efficient land use, reduce urban sprawl, and support environmentally sustainable urban development (Azmi et al., 2021; Ramlan et al., 2021). The integration of land use planning with transportation systems has significantly improved urban environmental management and reduced environmental impacts associated with urban expansion.

Malaysia's spatial planning implementation is also supported by strong institutional coordination and policy integration at national and local levels. Effective governance structures facilitate consistent policy implementation, regulatory enforcement, and environmental protection. Samat et al. (2019) found that coordinated spatial planning policies in Malaysia have helped manage urban expansion and reduce environmental pressures associated with rapid urbanization. In addition, effective land management and property regulation contribute to sustainable urban development by controlling land use and preventing environmentally harmful development practices (Abd Rahman et al., 2021).

Technological integration and smart city initiatives also contribute to improving spatial planning implementation effectiveness. The adoption of intelligent city concepts and digital governance tools enhances urban planning efficiency, monitoring capacity, and environmental management. Astuti et al. (2024) emphasized that digital transformation in urban planning supports data-driven decision-making, improves governance transparency, and enhances environmental sustainability outcomes. These technological advancements strengthen implementation effectiveness by enabling more accurate spatial planning, better monitoring of land use changes, and improved environmental governance.

Despite these strengths, Malaysia also faces challenges related to rapid urbanization and environmental pressures. Urban expansion beyond core metropolitan areas has created environmental and infrastructure challenges that require continuous policy adaptation and governance improvements (Samat et al., 2019). However, Malaysia's stronger institutional coordination and policy integration provide a more effective framework for managing these challenges compared to decentralized planning systems.

Comparatively, the effectiveness of green spatial planning implementation in Indonesia and Malaysia is influenced by governance structure, institutional capacity, policy coordination, and enforcement mechanisms. Indonesia's decentralized planning system provides flexibility but faces challenges related to policy enforcement, institutional coordination, and land use control. In contrast, Malaysia's centralized and coordinated planning system enables more consistent policy implementation and stronger environmental

governance outcomes. These findings highlight that implementation effectiveness is not solely determined by policy design but also by governance capacity, institutional coordination, and enforcement mechanisms.

The effectiveness of green spatial planning policies in promoting environmental sustainability depends on the integration of regulatory frameworks, institutional capacity, governance coordination, and technological support. Strengthening enforcement mechanisms, improving institutional coordination, enhancing public participation, and integrating technological innovations are essential to improving spatial planning implementation effectiveness. These factors play a crucial role in ensuring that green spatial planning policies effectively contribute to sustainable environmental governance and environmentally sustainable urban development.

Implications for Sustainable Environmental Governance

Green urban spatial planning has significant implications for sustainable environmental governance, particularly in shaping regulatory coherence, institutional coordination, ecological protection, and participatory decision-making processes. Environmental governance refers not only to regulatory control but also to the broader framework through which governments, institutions, and communities manage environmental resources sustainably within urban systems. Spatial planning functions as a strategic instrument to regulate land use, protect ecological functions, and guide urban development in ways that balance economic growth, social needs, and environmental sustainability. The integration of environmental principles into spatial planning frameworks strengthens governance effectiveness by ensuring that development activities remain aligned with ecological carrying capacity and long-term sustainability objectives. The legal and policy basis of spatial planning plays a central role in achieving this objective, particularly when supported by clear regulations, institutional accountability, and enforcement mechanisms (Simamora & Sarjono, 2022; Pemerintah Republik Indonesia, 2007).

One of the primary governance implications of green spatial planning is the protection and preservation of ecological functions within urban environments. Sustainable spatial planning ensures that critical ecological areas, including green open spaces, water catchment zones, and coastal ecosystems, are protected from uncontrolled urban expansion. The ecological function of urban space is essential in maintaining environmental balance, regulating hydrological systems, reducing urban heat island effects, and mitigating disaster risks such as flooding. Studies have shown that changes in land cover and uncontrolled urban development significantly disrupt hydrological systems and increase environmental vulnerability, particularly in rapidly growing metropolitan areas such as Jakarta (Septriana et al., 2020; Dahlia et al., 2018). Furthermore, the decline of green open spaces in major Indonesian cities reflects weaknesses in spatial planning enforcement and governance implementation, highlighting the importance of regulatory consistency and ecological protection in spatial planning systems (Budiman et al., 2014; Dwiyanto, 2009). Ensuring the sustainability of ecological functions within urban spatial planning contributes directly to environmental governance effectiveness by preserving environmental services and reducing long-term environmental risks (Mukaryanti & Suwedi, 2006).

In addition to ecological protection, green spatial planning strengthens governance capacity by promoting more structured and integrated land use management systems.

Sustainable urban spatial planning enables governments to regulate land allocation efficiently, prevent land use conflicts, and ensure compatibility between development activities and environmental capacity. This is particularly important in rapidly urbanizing regions, where uncontrolled expansion often leads to environmental degradation and inefficient land use patterns. Effective spatial planning policies ensure alignment between urban development plans and environmental sustainability objectives, which contributes to improved governance outcomes and sustainable urban growth (Anthony et al., 2018; Usop & Ikaputra, 2018). Furthermore, regulatory frameworks that incorporate environmental sustainability principles enable governments to enforce development controls more effectively, ensuring that urban expansion remains environmentally responsible and socially inclusive (Adiyanta, 2019; Nazaruddin, 2013).

Another important implication of green spatial planning for environmental governance is the strengthening of institutional coordination and regulatory integration. Sustainable environmental governance requires coordination between national, regional, and local authorities, as well as integration across sectors such as housing, transportation, infrastructure, and environmental protection. Weak institutional coordination often results in fragmented policies, regulatory overlaps, and ineffective implementation of environmental planning strategies. The transformation of spatial planning systems in Indonesia, particularly following decentralization reforms, has created both opportunities and challenges for environmental governance. While decentralization provides flexibility for local governments to adapt spatial planning policies to local environmental conditions, it also creates coordination challenges and inconsistencies in policy implementation (Rukmana, 2015). In contrast, Malaysia's more integrated planning system demonstrates the importance of regulatory alignment and institutional coordination in ensuring effective spatial planning implementation, particularly in transit-oriented development and compact city planning (Azmi et al., 2021; Ramlan et al., 2021).

Green spatial planning also contributes significantly to improving environmental governance through the integration of sustainable urban infrastructure and compact city development principles. Compact urban development reduces land consumption, promotes efficient resource use, and minimizes environmental degradation associated with urban sprawl. The integration of mixed-use development and public transportation systems reduces dependence on private vehicles, lowers carbon emissions, and improves overall environmental quality. Sustainable transport planning and integrated urban development strategies are essential components of environmentally sustainable cities, as they support resource efficiency and environmental protection (Ponrahono et al., 2015; Nordin et al., 2016). These planning strategies demonstrate how spatial planning can serve as a key governance tool for achieving broader environmental sustainability objectives and improving urban environmental performance.

Furthermore, green spatial planning strengthens environmental governance by promoting community participation and social inclusion in urban planning processes. Participatory spatial planning enhances governance transparency, accountability, and public trust, while ensuring that environmental policies reflect community needs and local environmental conditions. Community participation is essential for ensuring the sustainability of spatial planning policies, as local communities play a critical role in protecting environmental resources and supporting sustainable urban development initiatives (Adiyanta,

2018). Public participation also enhances policy legitimacy and improves policy implementation effectiveness by fostering shared responsibility between governments and communities in environmental management.

Another important implication is the role of spatial planning in improving urban resilience and adaptive environmental governance. Sustainable spatial planning enables cities to anticipate environmental risks, adapt to climate change, and enhance resilience to environmental shocks. Rapid urbanization, population growth, and environmental degradation increase vulnerability to environmental risks, including flooding, pollution, and ecosystem degradation. Effective spatial planning helps mitigate these risks by regulating development in environmentally sensitive areas and promoting sustainable land use patterns (Asian Development Bank, 2004; Samat et al., 2019). Furthermore, the integration of intelligent city concepts and digital technologies into spatial planning systems enhances governance efficiency, improves monitoring capabilities, and supports data-driven environmental decision-making processes (Astuti et al., 2024).

Green spatial planning also contributes to sustainable environmental governance by supporting environmentally sustainable economic development. Spatial planning enables governments to promote environmentally responsible economic activities, including ecotourism, sustainable coastal development, and green infrastructure investments. Sustainable spatial planning ensures that economic development activities remain aligned with environmental sustainability objectives, thereby reducing environmental degradation while supporting long-term economic growth (Mashur & Zulkarnaini, 2022; Kasman et al., 2023). Furthermore, sustainable spatial planning can enhance community welfare by supporting environmentally sustainable livelihoods, particularly in coastal and environmentally sensitive regions (Muchlashin et al., 2022; Zulham et al., 2021).

Finally, the effectiveness of green spatial planning in supporting environmental governance depends on regulatory enforcement, institutional capacity, and policy consistency. Weak enforcement mechanisms, regulatory conflicts, and institutional limitations can undermine the effectiveness of spatial planning policies and reduce their environmental governance impact. Evaluations of green city programs in Indonesian cities demonstrate that policy effectiveness is often constrained by implementation challenges, including institutional limitations, lack of coordination, and insufficient regulatory enforcement (Mindasari & Rostin, 2015; Noer et al., 2021). Therefore, strengthening institutional capacity, improving regulatory integration, and enhancing governance coordination are essential for ensuring the effectiveness of green spatial planning policies in achieving sustainable environmental governance.

In conclusion, green urban spatial planning plays a fundamental role in strengthening sustainable environmental governance by protecting ecological functions, improving land use management, enhancing institutional coordination, promoting community participation, supporting environmental resilience, and enabling sustainable economic development. The comparative experiences of Indonesia and Malaysia demonstrate that effective environmental governance requires not only strong regulatory frameworks but also institutional coordination, enforcement capacity, and policy integration. Strengthening these governance components is essential for ensuring that urban spatial planning contributes effectively to sustainable environmental protection and long-term urban sustainability.

CONCLUSION

This study highlights that green urban spatial planning policies in Indonesia and Malaysia play a critical role in strengthening sustainable environmental governance, particularly in regulating land use, protecting ecological systems, and guiding environmentally responsible urban development. Both countries have demonstrated strong policy commitments to integrating environmental sustainability into their spatial planning frameworks. However, the comparative analysis reveals important differences in governance structure and implementation effectiveness. Malaysia's more centralized and coordinated planning system provides stronger regulatory alignment, clearer institutional coordination, and more consistent implementation of sustainability-oriented planning policies. In contrast, Indonesia's decentralized spatial planning system offers flexibility and local adaptability but faces significant challenges related to policy fragmentation, inconsistent enforcement, and varying institutional capacity across regions. These structural differences directly influence the effectiveness of environmental governance and the ability of spatial planning systems to achieve sustainable urban development outcomes.

The study confirms that effective green spatial planning contributes significantly to environmental sustainability by preserving ecological functions, promoting efficient land use, strengthening urban resilience, and supporting sustainable economic development. The integration of environmental principles into spatial planning enhances governance capacity by ensuring that urban development remains aligned with ecological limits and long-term sustainability goals. However, the success of these policies depends on strong institutional capacity, regulatory consistency, effective enforcement mechanisms, and active stakeholder participation. Therefore, strengthening policy integration, improving intergovernmental coordination, and enhancing implementation capacity are essential strategic priorities for both Indonesia and Malaysia. These efforts will ensure that green urban spatial planning functions not only as a regulatory instrument but also as a transformative governance framework capable of supporting sustainable, resilient, and environmentally responsible urban futures.

ACKNOWLEDGEMENTS

The authors would like to express their sincere gratitude to the leadership of Universitas Islam Jakarta, Indonesia, and Universitas Swadaya Gunung Jati, Indonesia, for their continuous support, academic encouragement, and institutional facilitation throughout the completion of this research.

We deeply appreciate the commitment of both institutions in fostering scholarly development, promoting international research collaboration, and providing an enabling academic environment that made this study possible. Their dedication to advancing knowledge in the field of urban and environmental governance has been instrumental in supporting the successful preparation of this article for international publication.

REFERENCES

- Abd Rahman, N. A. Y., Senawi, A., Mohamed Saraf, M. H., & Che Pin, S. F. (2021). Investigation of Impediment Factors in Property Tax Revaluation Practices. *Planning Malaysia*, 19(16). <https://doi.org/10.21837/pm.v19i16.960>
- Abdul, A., & Hameed, S. (2021). Green Cities and Sustainable Urban Development: Subject Review. *International Journal of Advances in Scientific Research and Engineering*

- (IJASRE), 6(11), 31–36. <https://doi.org/10.31695/IJASRE.2020.33929>
- Adiyanta, F. C. S. (2018). Partisipasi Masyarakat sebagai Basis Kebijakan Penataan Ruang Publik dan Ruang Terbuka Hijau Kota yang Berkelanjutan. *Administrative Law & Governance Journal*, 1(2), 1–8.
- Adiyanta, F. C. S. (2019). Hukum dan Rencana Tata Ruang Kota: Urgensi Kebijakan Pembangunan Kawasan Perkotaan Berbasis Sustainable Eco City. *Masalah-Masalah Hukum*, 48(2), 137–146.
- Anggriani, N. (2010). Ruang Publik dalam Perancangan Kota. Yayasan Humaniora.
- Anthony, A. F., Offia, I. E., Abidemi, B. R., Kola, O., & Kamoru, G. (2018). Urban Sustainability Concepts and Their Implications on Urban Form. *Urban and Regional Planning*, 3(1), 27–33. <https://doi.org/10.11648/j.urp.20180301.15>
- Asian Development Bank. (2004). Water in Asian Cities: Utilities' Performance and Civil Society Views. Asian Development Bank.
- Astuti, S. B., Wahyudie, P., Anggraeni, L. K., Tanadda, O. A., Azahra, L. A., Dewi, M. R., Anugrahaning, M., & Putri, K. (2024). Transformasi Digital dan Sumberdaya Manusia dalam Konsep Intelligent City di Kawasan Pesisir Wilayah Perkotaan. *Jurnal Ilmu Sosial Dan Humaniora*, 13(2), 221–233. <https://doi.org/10.23887/JISH.V13I2.75132>
- Ayat, M., & Jonizar. (2019). Konsep Pembangunan Permukiman Berwawasan Lingkungan. *Jurnal Arsitektur Dan Perencanaan*, 6(2).
- Azmi, N. A., Osman, M. M., Rabe, N. S., Ramlan, N. H., Azizan, A., & Amiruddin, S. (2021). A Comparative Analysis of Land Use and Compact City Principles and Guidelines on Rail Public Transit Stations in Malaysia. *Planning Malaysia*, 19(15). <https://doi.org/10.21837/pm.v19i15.935>
- Badan Pusat Statistik. (2020). Provinsi DKI Jakarta dalam Angka 2020. Badan Pusat Statistik.
- Budiman, A., Sulistyantara, B., & Zain, A. F. (2014). Deteksi Perubahan Ruang Terbuka Hijau pada 5 Kota Besar di Pulau Jawa (Studi Kasus: DKI Jakarta, Kota Bandung, Kota Semarang, Kota Yogyakarta, dan Kota Surabaya). *Jurnal Lanskap Indonesia*, 6(1), 7–15. <https://doi.org/10.29244/jli.2014.6.1>
- Dahlia, S., Nurharsono, T., & Rosyidin, W. F. (2018). Analisis Kerawanan Banjir Menggunakan Pendekatan Geomorfologi di DKI Jakarta. *Jurnal Alami: Jurnal Teknologi Reduksi Risiko Bencana*, 2(1), 1–8. <https://doi.org/10.29122/alami.v2i1.2259>
- Dwiyanto, A. (2009). Kuantitas dan Kualitas Ruang Terbuka Hijau di Permukiman Perkotaan. *TEKNIK*, 30(2), 88–92.
- Kasman, K., Martha, T. L., & Johan, Y. (2023). Pengembangan Pariwisata Berbasis Penataan Ruang di Pulau Tidung Besar Kepulauan Seribu. *Jurnal Enggano*, 8(1), 59–66. <https://doi.org/10.31186/JENGGANO.8.1.59-66>
- Mashur, D., & Zulkarnaini. (2022). Analisis Prospektif Strategi Pengembangan Ekowisata di Kawasan Pesisir Pantai. *Jurnal Kebijakan Publik*, 13(1). <https://doi.org/10.31258/JKP.V13I1.7984>
- Mindasari, S., & Rostin. (2015). Evaluasi Program Pengembangan Kota Hijau (Green City) di Kota Kendari. *Jurnal Ekonomi Pembangunan (JEP) UHO*, 5(2), 49–56.
- Muchlashin, A., Putri, W. A., Asya'bani, N., & Nurfajrin, S. (2022). Pemberdayaan Ekonomi Masyarakat Nelayan di Kampung Mumes Raja Ampat Papua Barat. *Amalee: Indonesian Journal of Community Research and Engagement*, 3(2), 235–249. <https://doi.org/10.37680/AMALEE.V3I1.1562>
- Mukaryanti, A. M. Z., & Suwedi, N. (2006). Keberlanjutan Fungsi Ekologis sebagai Basis Penataan Ruang Kota Berkelanjutan. *Jurnal Teknik Lingkungan*, 7(1), 7–15.
- Nazaruddin, T. (2013). Penegakan Hukum dan Kebijakan Penataan Ruang Menuju Kota Berkelanjutan. *Jurnal Nanggroe*, 2(1).
- Negara, A. P. P. (2021). Analisis Persebaran Penduduk di Kabupaten Kepulauan Seribu, Provinsi DKI Jakarta [Universitas Negeri

- Jakarta]. <http://repository.unj.ac.id/18638/>
- Neksidin, Fahrudin, A., & Krisanti, M. (2021). Keberlanjutan Pengelolaan Wisata Bahari di Pulau Pari, Kabupaten Kepulauan Seribu. *Jurnal Ilmu Pertanian Indonesia*, 26(2), 284–291. <https://doi.org/10.18343/jipi.26.2.284>
- Noer, R., Fuady, M., & Ridwan, N. (2021). Evaluasi Implementasi Konsep Kota Hijau di Kota Banda Aceh. *Jurnal Ilmiah Mahasiswa Arsitektur Dan Perencanaan*, 5(4), 49–53.
- Nordin, N., Majid, M. R., Chin Siong, H., & Kurata, G. (2016). Co-Benefit Modeling and Optimization of Air Pollution Control in Iskandar Malaysia: A Methodology Using BenMAP. *Planning Malaysia*, 14(4). <https://doi.org/10.21837/pm.v14i4.165>
- Pemerintah Republik Indonesia. (2007). Undang-Undang Nomor 26 Tahun 2007 tentang Penataan Ruang. Ponrahono, Z., Bachok, S., Mohamed Osman, M., Ibrahim, M., Abdullah, M. F., & Abdullah, A. (2015). Assessing the Urban and Rural Stage Bus Services Disparities in Peninsula Malaysia. *Planning Malaysia*, 13(5). <https://doi.org/10.21837/pm.v13i5.140>
- Ratnaningtyas, E. M., Ramli, Syafruddin, Edi Saputra, Suliwati Desi, Bekty Taufiq Ari Nugroho, Karimuddin, Muhammad Habibullah Aminy, Nanda Saputra, Khaidir, & Jahja, A. S. (2023). Metodologi Penelitian Kualitatif. Yayasan Penerbit Muhammad Zaini.
- Ramlan, N. H., Osman, M. M., Rabe, N. S., Azizan, A., Azmi, N. A., & Amiruddin, S. (2021). Assessing the Current Implementation of Compact and Mixed-Use Development within Public Rail Transit Stations in Malaysia. *Planning Malaysia*, 19(15). <https://doi.org/10.21837/pm.v19i15.934>
- Rukmana, D. (2015). The Change and Transformation of Indonesian Spatial Planning after Suharto's New Order Regime: The Case of the Jakarta Metropolitan Area. *International Planning Studies*, 20(4), 350–370. <https://doi.org/10.1080/13563475.2015.1008723>
- Samat, N., Mahamud, M. A., Abdul Rashid, S. M. R., Elhadary, Y., & Mohd Noor, N. (2019). Urbanisation Beyond Its Core Boundary and Its Impact on the Communities in George Town Conurbation, Malaysia. *Planning Malaysia*, 17(10). <https://doi.org/10.21837/pm.v17i10.627>
- Savitri, R., & Fransiska, E. (2022). Analisis Kesesuaian Penggunaan Lahan Terhadap Rencana Detail Tata Ruang (RDTR) DKI Jakarta Kelurahan Pulo Gebang, Kecamatan Cakung Kota Jakarta Timur. *Jurnal Ilmiah Plano Krisna*, 18(1), 28–45. <https://jurnalteknik.unkris.ac.id/index.php/plano/article/view/172>
- Septriana, F. E., Alnavis, N. B., Gustia, R., Wirawan, R. R., Putri, P., Hasibuan, H. S., & Tambunan, R. P. (2020). Dampak Perubahan Tutupan Lahan pada Sistem Hidrologi di Jakarta. *Majalah Ilmiah Globe*, 22(1), 51–58. <https://doi.org/10.24895/MIG.2020.22-1.1150>
- Simamora, J., & Sarjono, A. G. A. (2022). Urgensi Regulasi Penataan Ruang dalam Rangka Perwujudan Pembangunan Berkelanjutan di Indonesia. *Nommensen Journal of Legal Opinion*, 3(1), 59–73. <https://doi.org/10.51622/NJLO.V3I1.611>
- Sudawardani, M. M., & Ekaputra, Y. D. (2017). Kajian Penambahan Ruang Terbuka Hijau di Kota Semarang. *Jurnal Teknik Sipil Dan Perencanaan*, 19(1), 47–56. Supratiwi. (2018). Studi Ruang Terbuka Hijau dalam Kebijakan Pengelolaan Lingkungan Hidup Pemerintah Kota Semarang. *Jurnal Ilmiah Ilmu Pemerintahan (JIIP)*, 3(2), 89–98.
- Suweda, I. W. (2011). Penataan Ruang Perkotaan yang Berkelanjutan, Berdaya Saing dan Berotonomi (Suatu Tinjauan Pustaka). *Jurnal Ilmiah Teknik Sipil*, 15(2), 113–122.
- Usop, T. B., & Ikaputra. (2018). Menelusuri Pembangunan Kota yang Berkelanjutan. *Jurnal Perspektif Arsitektur*, 13(1), 313–329.

Zulham, A., Achmad, Z., Umi, M., & Risna, Y. (Eds.). (2021). Inovasi Kebijakan Sosial Ekonomi Pembangunan Kelautan dan Perikanan. AMaFRaD Press.