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Implementation of environmental policies on the development of a new capital city in Indonesia

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ABSTRACT

This study aims to analyze the implementation of environmental policies in developing New Capital City (IKN) in Indonesia. IKN is a large-scale project that demands a comprehensive and effective environmental policy to maintain environmental sustainability. This study uses a qualitative approach focusing on thematic analysis through the results of examining official government documents. The analysis tool that is maximized is Nvivo 12 Plus. The research results show that implementing environmental policies in the IKN area faces complex challenges, including coordination between institutions and stakeholders. The proposed recommendations include implementing accommodative and adaptive policies, routine monitoring and evaluation, close collaboration between the government and stakeholders, and increasing public education efforts and environmental awareness. Policies that are responsive, flexible, and involve all parties will be the basis for achieving environmental sustainability goals in the development of IKN.

IMPACT STATEMENT

This study provides an in-depth look at the implementation of environmental policy in the development of the new Capital City (IKN) in Indonesia, highlighting the complex challenges faced and essential recommendations for achieving environmental sustainability. With a focus on thematic analysis using Nvivo 12 Plus, the findings of this research provide a valuable contribution to policy practitioners, environmental scientists and other stakeholders involved in the development of the New Capital City. It is hoped that the results of this research will become the basis for formulating more effective and sustainable policies, as well as inspiring close collaboration between government and society in order to achieve sustainable development goals.

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Introduction

Despite initially planning to adopt strict environmental policies to develop the new capital city (IKN), the Indonesian government faced sharp criticism as it was found to be environmentally damaging construction projects and neglected the protection of sensitive ecosystems around the new location. Forest Watch Indonesia (FWI) explained that the massive development of the IKN, which will be carried out from 2022 to 2023, will impact changes in the forest landscape and the environment within the IKN area. From the analysis results, there needs to be more consistency in using space from ongoing development activities. This causes environmental damage and triggers flooding in the IKN area (Jawapos, 2023). Several other study results also confirm that the idea of developing IKN also has the potential to damage the environment if not managed properly (Baharuddin et al., 2022; Ibrahim et al., 2023; Rifaid, Abdurrahman, et al., 2023).

So far, ecological sustainability has been a major concern in urban development projects (Moroke et al., 2019; Yigitcanlar & Teriman, 2015). Without maintaining and restoring ecosystems, cities can experience environmental damage detrimental to humans and other life (Abubakar & Dano, 2020; Shao et al., 2021). For example, clearing forests for infrastructure development can reduce water reserves, increase

the risk of flooding, and eliminate natural habitats for flora and fauna (Jayathilake et al., 2021; Urzedo & Chatterjee, 2021). Air and water pollution caused by city construction and industrial activities can also hurt public health and local ecosystems (Guan et al., 2016; Saxena & Sonwani, 2019). In addition, protecting the environment in urban development projects is also closely related to global climate change. Development projects that use natural resources excessively or produce greenhouse gas emissions will increase global warming and extreme climate change (Aryal et al., 2020; Dale et al., 2020; Lidskog & Elander, 2010; Malik et al., 2023).

Therefore, it is important to implement environmentally friendly development practices, such as the use of renewable energy, energy efficiency, good waste management, and protection of green and open land (Hackbarth & de Vries, 2021; Lambin & Meyfroidt, 2010; Li et al., 2019; Oldenbroek et al., 2021; Østergaard et al., 2020). In addition to ecological benefits, environmental sustainability in urban development projects also positively impacts social and economic aspects (Landry & Chirwa, 2011). By maintaining environmental sustainability, cities can create healthy and comfortable open spaces for their citizens, improve air quality, and reduce the risk of natural disasters. In addition, it requires a strong and active environmental policy from the government in urban development projects (Jonas, 2020; Qin et al., 2021). The role of governments in implementing environmental policies is very important because they have the legal power, authority, and resources to influence development practices (Steinebach, 2022; Zhang et al., 2022).

Very little research has been done on the new capital city, especially discussing issues surrounding environmental policies simultaneously. Several previous studies also found the same research gap, especially when discussing the topic of developing a new capital city in Indonesia (Baharuddin et al., 2022; Ibrahim et al., 2023; Nurdin & Baharuddin, 2023; Rifaid, Abdurrahman, et al., 2023). However, there are still some relevant study results that can be mapped. First, the new capital city is a project that involves building a city as the center of government of a country. In the Indonesian context, the plan to move the capital city from Jakarta to a new location in East Kalimantan is an attempt to reduce the burdens and problems faced by Jakarta, such as high population density, traffic congestion, and environmental damage (Rahmat et al., 2021; Teo et al., 2020). Second, the construction of a new capital city in Indonesia aims to create a modern city designed with the principles of sustainability, efficiency, and good quality of life (Baharuddin et al., 2022; Rifaid, Abdurrahman, et al., 2023; Sensuse et al., 2022). Third, environmental policy is a framework established by the government to regulate practices that have an impact on the environment (Hofstad et al., 2022; Hsu et al., 2021).

Moving the national capital has become a strategic action implemented by several countries before Indonesia. For example, Brazil moved its capital from Rio de Janeiro to Brasília in 1960 to reduce economic and political imbalances (Obermayr et al., 2023). Pakistan also moved to Islamabad in 1961 for a more central location (Daechsel, 2013). Myanmar moved to Naypyidaw in 2005 to address population and access issues (Seekins, 2009), and Nigeria also moved its capital to Abuja in 1991 to reduce regional imbalances (Imam et al., 2008). The decision to move the capital has a major impact on the country's development and stability. Indonesia is also taking similar steps to move the capital to Kalimantan to address similar challenges.

There still needs to be more to find specific and simultaneous research results discussing relocating the new nation's capital, especially by assessing cases in Indonesia (IKN) by linking it to environmental policy issues. Knowing gaps in previous research has important benefits, especially in helping this research accommodate them. This study aims to fill in the gaps in previous research by analyzing the policies for developing the new capital city (IKN), which focuses on implementing environmental policies. Some of the research questions are described as follows. (1) What is the urgency and effort to maintain environmental sustainability around the IKN development area? (2) What challenges are faced in implementing environmental policies amid the development of IKN? (3) What policy recommendations are needed? The answers to these three questions make it possible to find out the government's urgency, efforts, and challenges in implementing environmental policies in the IKN area, as well as map out more accommodative policy recommendations in the future.

This knowledge implies that the government can use the research results to design more effective policies for developing the new capital city (IKN) and environmental aspects. The Indonesian government can take an example from this research to identify sustainability principles in planning for a new capital

city. Knowing the government's urgency, efforts, and challenges means that this research can help the government understand the importance of relocating a new capital city by paying attention to environmental aspects, maximizing the efforts that have been made for better planning going forward, as well as the challenges faced in the current process and the future. This information can assist the government in making more informed decisions, addressing issues that arise, and ensuring that the new capital city's construction aligns with the stated goals, including sustainability and environmental protection principles.

Method

This study uses a qualitative approach with a focus on thematic analysis. The thematic analysis was chosen to maximize the analysis of smart city development ideas in the new capital city in Indonesia. This approach was chosen to guide researchers to find sources of analysis directly from the government. This has been used in several other studies in examining cases through documents related to IKN (Ibrahim et al., 2023; Rifaid, Abdurrahman, et al., 2023). A data search was carried out by identifying official government documents. This data is related to the Presidential Regulation of the Republic of Indonesia Number 63 of 2022 concerning the Master Plan for the New Capital City (Presidential Regulation, 2022). The process of analyzing the research data is seen in Figure 1.

Figure 1 illustrates the analysis process that begins with data collection. Data collection that is considered appropriate is an official government document, namely Presidential Regulation of the Republic of Indonesia Number 63 of 2022, concerning the Master Plan for the New Capital City (Nusantara). The data collection process is carried out by downloading the document using the Nvivo 12 tool as an analysis tool, which allows screenshots of the contents of the document regarding Presidential Regulation of the Republic of Indonesia Number 63 of 2022 concerning the Master Plan for the New Capital City (Nusantara). The collected data is then transferred to the Nvivo 12 Plus analysis tool. In data coding, the Nvivo 12 Plus analysis tool provides features that can be leveraged. First, 'Identify the theme' is used to identify the information contained in the document that has been collected. This feature helps in selecting and determining relevant themes in the analysis (Sotiriadou et al., 2014).

Then, the 'Cases and attribute classifications' feature is used to categorize the data that has been collected. This allows researchers to group data based on certain attributes that are relevant to research.

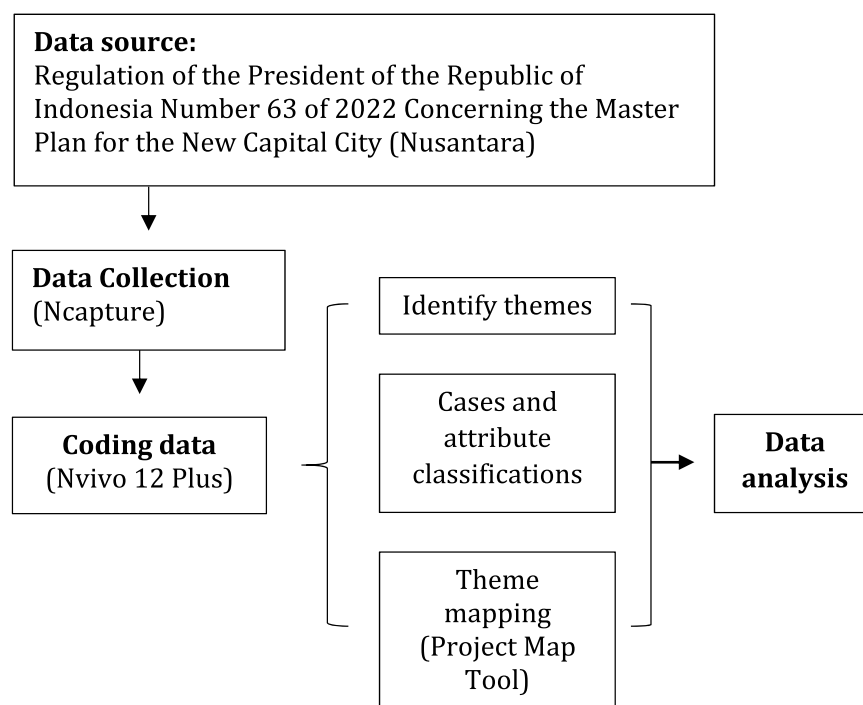


Figure 1. Data analysis process.

Finally, the 'Theme mapping' feature is useful for mapping the data encoding results. This feature helps in seeing patterns and relationships between pre-categorized themes (Paulus et al., 2017; Sotiriadou et al., 2014). After the data coding was completed, the coding results were analyzed and described to answer the research questions posed. A deeper description of the results of the analysis can reveal important findings and information found from the data that has been collected and analyzed.

The validity of the data in this research depends on the accuracy and representation of the document used as a data source, namely the Presidential Regulation of the Republic of Indonesia Number 63 of 2022 (Presidential Regulation, 2022). To ensure validity, this research confirms that the downloaded document is the official version and has not experienced any changes or deviations during the download process. Data reliability in this research includes the reliability of the data collection process, data coding, and data analysis. In this case, using Nvivo 12 analysis tools with the features mentioned can help ensure consistency in grouping themes and data attributes (Rossolatos, 2019). In addition, validity and reliability were continuously monitored throughout the research cycle. This has also been adopted by many previous researchers in various studies (Leung, 2015; Riege, 2003).

Results and discussion

In this section, data analysis is carried out to answer the three main research questions described previously. The data for this analysis was obtained by collecting official government documents, specifically the Presidential Regulation of the Republic of Indonesia Number 63 of 2022 concerning the State Capital Master Plan (IKN). This document was then analyzed using the Nvivo 12 Plus software for the data coding process, making it easier for researchers to present and interpret the data to answer the research questions posed.

Government efforts: the urgency of environmental sustainability in the IKN development area

The development of a new capital city (IKN) in Indonesia is a major project involving the construction of a new city as the center of government (Presidential Regulation, 2022). In this context, environmental sustainability has quite a crucial urgency. Environmental sustainability means considering environmental impacts in every aspect of the development of the IKN area, from planning, construction, and use of resources to waste management (Presidential Regulation, 2022). This is important for protecting and sustaining ecosystems, reducing greenhouse gas emissions, and adopting sustainable practices. Several reasons can explain the urgency of environmental sustainability in the IKN development area, as seen in Figure 2.

The new capital city (IKN) development project manifests the Indonesian government's commitment to creating a modern and sustainable government center. By dividing the project into five stages from 2022 to 2045, the government shows its determination to make IKN an influential center on a national and international scale. This goal includes encouraging economic growth in the Eastern Region of

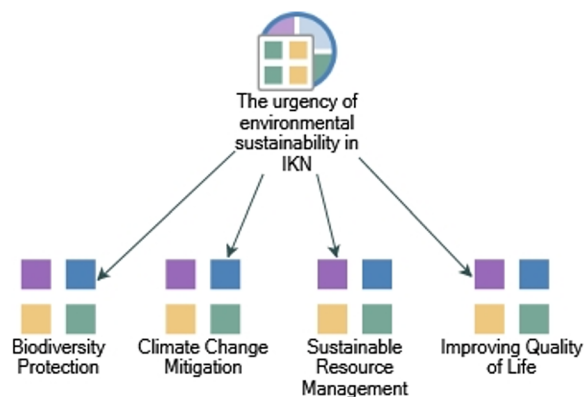


Figure 2. Sustainable environmental urgency in IKN. *Source:* Processed by researchers using Nvivo 12 Plus, 2023.

Indonesia and strengthening domestic value chains there, thereby playing an important role in regional economic development. More importantly, the emphasis on global governance, sustainable urban development, and awareness of the importance of protecting the environment confirms the government's commitment to the environmental aspects of this project (Presidential Regulation, 2022).

In this regard, the Presidential Regulation of the Republic of Indonesia Number 63 of 2022 has become an important instrument that compels the government to pay attention to and integrate sustainability and environmental protection principles in all stages of IKN development. These steps include better coordination between agencies, more effective oversight, and active public and private sector involvement in supporting the government's vision. With this approach, the government hopes that IKN can become a successful model of sustainable development, where economic development and environmental protection can go hand in hand, creating a comprehensive positive impact on the community and the surrounding environment (Presidential Regulation, 2022).

The IKN development area has diverse and valuable ecosystems (Baharuddin et al., 2022). Through a sustainable approach, environmental sustainability will help protect the existing biodiversity, including flora, fauna, and natural ecosystems. This can be seen in the documents studied, specifically in Chapter III concerning the basic principles of IKN development (Presidential Regulation, 2022). This shows that there is significant urgency in maintaining environmental sustainability in the development stage. That means biodiversity helps maintain the balance of the ecosystem. Each species has a unique role in maintaining ecosystem functions, such as plant pollinators, organic matter decomposers, and oxygen producers (Palumbi et al., 2009; Scheffers & Pecl, 2019). If biodiversity is disturbed, ecosystems can become unstable and vulnerable to disturbance and change. In addition, biodiversity also provides various natural resources that are important for human life. Plants provide food, raw materials for medicines, fiber, and building materials. Animals provide a source of protein, fuel, and other materials. Biodiversity also provides ecosystem services such as clean water and disease control (Howes et al., 2020; van Rees et al., 2021).

In addition, the development of IKN also needs to adopt measures to mitigate climate change by reducing greenhouse gas emissions and carbon footprint. This can also be seen in the documents studied, specifically in Chapter III concerning the basic principles of IKN development (Presidential Regulation, 2022). By considering renewable energy, energy efficiency, and sustainable transportation, the IKN area can contribute to climate change mitigation efforts. Renewable energy, energy efficiency, and sustainable transportation are interrelated concepts and contribute to efforts to reduce negative impacts on the environment and promote sustainability in the energy and transportation sectors. Renewable energy refers to energy sources from natural resources that can be renewed continuously, such as sunlight, wind, water, biomass, and geotherma (Lamb & Steinberger, 2017; Noussan et al., 2020). Energy efficiency involves using energy more efficiently, reducing energy consumption while meeting the same needs (Pardo-Bosch et al., 2022; Rana et al., 2020; Zekić-Sušac et al., 2021). Sustainable transportation refers to a transportation system that is environmentally friendly, efficient and contributes to reducing greenhouse gas emissions (Chien et al., 2022; Frank et al., 2021; Krishna, 2021).

In developing IKN, natural resources such as water, energy, and land must be managed sustainably (Presidential Regulation, 2022). This was observed in the documents studied, specifically in Chapter III. An approach that focuses on the efficient use of resources, protection of water quality, and sound waste management will ensure the area's continued development (Mello et al., 2020; Nanda & Berruti, 2021). Water is a very important natural resource in the development of IKN (Ibrahim et al., 2023). In sustainably managing water, it is necessary to pay attention to the efficiency of water use, protection of water quality, and conservation of water resources (He et al., 2020; Yang et al., 2020). Measures such as the use of water-saving technologies, management of water recycling, and efficient irrigation arrangements can help reduce water consumption and ensure sufficient water availability for the needs of the IKN area.

In addition, the land is an important asset in the development of IKN, and its management must be carried out with due regard to sustainability (Ibrahim et al., 2023). Selection of the right location, efficient land use, and protection of existing ecosystems and biodiversity are important factors in sustainable land management (Visser et al., 2019). Efforts to conserve land, restore ecosystems, and use sustainable agricultural practices can help maintain land quality and prevent degradation (Abhilash, 2021; Bustamante et al., 2019). In the development of IKN, good waste management is important to maintain the cleanliness and health of the area (Presidential Regulation, 2022). An efficient waste management system that

complies with environmental standards can reduce negative impacts on water and soil and reduce pollution (Mungai et al., 2020). Waste recycling, organic waste processing, and innovative waste treatment technologies can be steps in sustainable waste management in the IKN area.

Another urgency is identified in the aspect of improving the quality of life. This is explained quite comprehensively in Chapter III regarding the basic principles of IKN development in the documents studied (Presidential Regulation, 2022). Environmental sustainability also plays an important role in improving residents' quality of life in the IKN area. By providing green open spaces, reducing air and water pollution, and creating a healthy and comfortable environment, the IKN area can be a good place to live and work (Ibrahim et al., 2023). It is important to understand that environmental sustainability is not only about protecting nature but also involves social and economic aspects (Khan & Hou, 2021). In the context of the development of IKN, environmental sustainability is an important foundation for building a sustainable city that respects the environment and improves the quality of life of its inhabitants.

In developing the new capital city (IKN), protecting biodiversity and managing natural resources such as water, energy, and land sustainably. An approach that focuses on the efficient use of resources, protection of water quality, and sound waste management will ensure the region's sustainable development. In addition, the IKN development efforts also aim to improve the community's quality of life by providing a healthy environment, qualified infrastructure, employment opportunities, economic growth, and access to good education and health. By paying attention to these aspects, the development of IKN can have a broad positive impact on society, both in terms of economic, social, and environmental aspects, as well as improve the quality of life as a whole. Although bridging this idea, there are still some serious challenges.

A challenge: implementation of environmental policies in the IKN area

Implementing environmental policies in the new capital city (IKN) is a complex and demanding challenge. The development of IKN requires serious attention to environmental aspects, considering the significant impact on ecosystems, biodiversity, and air and water quality. This study succeeded in mapping out some of the common challenges faced, which are described in [Figure 3](#).

The development of IKN is a large-scale project that involves major changes in land use, infrastructure, and human activities (Baharuddin et al., 2022). This demands a comprehensive and effective environmental policy to manage its impacts. The main challenge is aligning development needs with environmental protection so that environmental sustainability is maintained on a large scale. This also has an impact on coordination complexity. Implementing environmental policies in the IKN area involves various parties, including the government, stakeholders, and the community. Effective coordination between various agencies and sectors is an important challenge. Strong synergy is needed between government institutions, integrated planning, and the community's active participation in environmental policy decisions. Different regulatory and policy complexity levels can also complicate coordination between agencies and stakeholders. Good coordination is necessary to ensure clear understanding and consistency in environmental policy implementation.

The development of IKN has the potential for significant environmental impacts, such as ecosystem damage, decreased water and air quality, and loss of habitat for flora and fauna. Environmental policy implementation should ensure effective environmental protection by controlling and mitigating negative impacts. Applying environmentally friendly technologies, sustainable resource management, and strict environmental monitoring are important in dealing with this challenge. In addition, environmental awareness and education is also a serious challenge. Increasing public awareness and understanding of the importance of the environment and its protection in developing IKN is considered one of the strategic efforts. Effective environmental education and social campaigns can help communities understand the benefits of environmental policies and their role in maintaining the sustainability of the IKN area.

The new capital city (IKN) development as a large-scale project demands a comprehensive and effective environmental policy to manage its impact. The main challenge is to align development with environmental protection on such a large scale, which requires complex coordination between government,

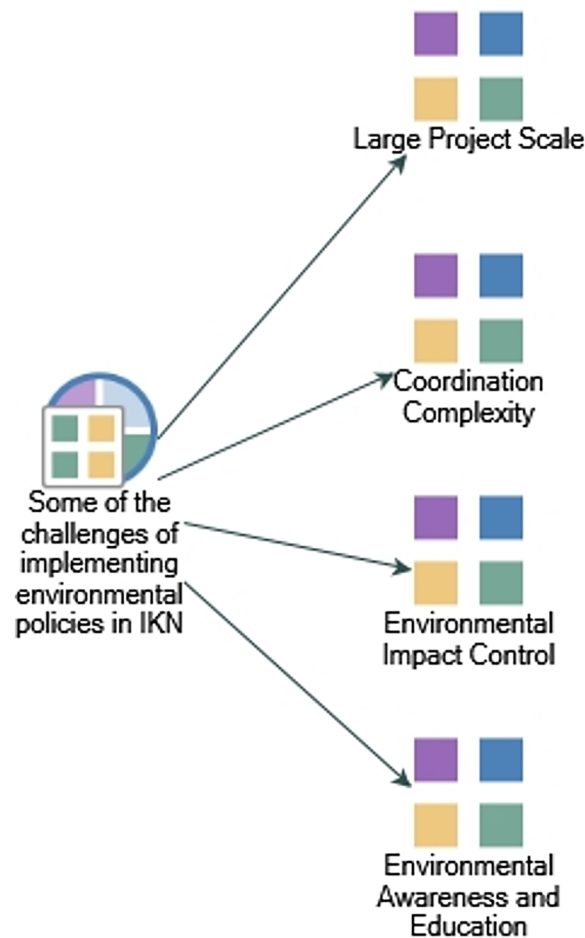


Figure 3. The challenges of implementing environmental policies in IKN. *Source:* Processed by researchers using Nvivo 12 Plus, 2023

stakeholders, and communities. Synergy is needed between government institutions, integrated planning, active community participation, and good coordination to maintain environmental sustainability. Other challenges include; controlling and mitigating negative impacts on ecosystems and environmental quality, using environmentally friendly technologies, sustainably managing natural resources, and increasing public awareness and understanding of the importance of protecting the environment in developing IKN.

An accommodative and adaptive policy recommendation

In facing the challenges of implementing environmental policies in the IKN area, a collaboration between the government, stakeholders, and the community is very important. Awareness of the importance of maintaining environmental sustainability must be the main basis for making sustainable decisions and actions (Rustam et al., 2020). With a holistic approach, strong synergy, and active involvement of all parties, implementing environmental policies in the IKN area can be realized successfully. Following are some helpful and adaptive policy recommendations that can be applied in implementing environmental policies in the new capital city (IKN). This can be seen in Figure 4.

Implement environmental policies that allow flexibility in their implementation. This allows for adjustments to conditions and developments that occur in the field. For example, policies that can adapt to technological changes and new knowledge to ensure effective environmental protection are needed in terms of environmental protection requirements. In addition, it is possible to adopt an adaptive approach in planning the development of the IKN area. This means paying attention to flexibility in long-term plans and allowing adjustments according to changing conditions and needs. Thus, environmental policies can be updated regularly and adapted to environmental developments and community needs (Ibrahim et al., 2023; Nurdin & Baharuddin, 2023; Rifaid, Rachman, et al., 2023).

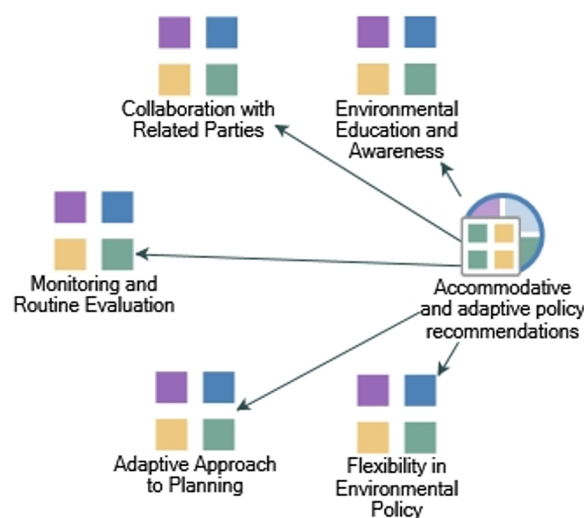


Figure 4. Mapping accommodative and adaptive policy recommendations. *Source:* Processed by researchers using Nvivo 12 Plus, 2023.

In addition, increasing educational efforts and environmental awareness among the community and stakeholders regarding the importance of environmental sustainability in the development of the IKN area so that all parties can better understand and be involved in efforts to protect the environment. In this case, the government can facilitate the provision of easily accessible information and promote environmentally friendly behavior. By implementing accommodative and adaptive policies, the government can face the challenges that arise in implementing environmental policies in the IKN area more effectively. Flexibility, adaptability, collaboration, and strong environmental awareness will be the foundation for achieving the desired environmental sustainability goals.

In developing the new capital city (IKN), an environmental policy is needed that allows flexibility and adaptability in its implementation. This allows adjustments to changing conditions and developments in the field and considers new knowledge and relevant technologies. Regular monitoring and evaluation are essential to monitor environmental policy implementation and ensure effective sustainability. Close collaboration between the government, stakeholders, and the community is also needed to create policies that are accommodative and responsive to various interests and problems that arise. In addition, increasing environmental awareness and education among the public and stakeholders will strengthen efforts to protect the environment. By implementing accommodative and adaptive policies, the government can effectively face the challenges of implementing environmental policies in the IKN area and achieve the desired environmental sustainability goals.

By implementing environmental policies that allow flexibility and adaptability in their implementation, the government can ensure adequate environmental protection in the IKN area while still responding to developments in new technology and knowledge. Close collaboration between government, stakeholders, and society is necessary to create policies that are responsive and inclusive to various interests and problems that arise. Increasing environmental awareness and education will also strengthen environmental protection efforts, while regular monitoring and evaluation will ensure effective and sustainable policy implementation. Thus, implementing accommodative and adaptive policies will be a solid basis for achieving the desired environmental sustainability goals in the future development of IKN.

Conclusion

The new capital city (IKN) development is a large-scale project that requires a comprehensive and effective environmental policy. The main challenge is to align development with environmental protection on a large scale. To overcome this challenge, accommodative and adaptive policies are needed that allow flexibility in implementation and routine monitoring and evaluation. Environmental policies must adapt to changing conditions and technological developments to ensure effective environmental protection. In

addition, close collaboration between the government, stakeholders, and the community is also key to maintaining environmental sustainability. Good coordination between all parties and active participation in decision-making related to environmental policy is very crucial.

Apart from that, the protection of biodiversity, use of renewable energy, energy efficiency, and sustainable transportation are also important focuses in environmental policy to develop IKN. Strict environmental monitoring, application of environmentally friendly technologies, and sustainable management of resources should be an integral part of environmental policies. In addition, increasing public awareness and understanding of the importance of the environment and its protection in developing IKN is considered one of the strategic efforts. Effective environmental education and social campaigns can help communities understand the benefits of environmental policies and their role in maintaining the sustainability of the IKN area. By implementing accommodative, adaptive policies involving all parties, the development of IKN can run successfully while maintaining environmental sustainability and improving the community's quality of life.

For further research, it is recommended to study the implementation and impact of environmental policies in developing the new capital city (IKN). Specifically considering other research data sources outside of the results of document analysis. Research can focus on field studies by concretely evaluating the effectiveness of policies that have been implemented, measuring their impact on environmental conservation, and identifying obstacles and challenges that may arise in the implementation process. Future research could also involve comparative analysis with similar projects in other countries to identify best practices in integrating sustainable development in large infrastructure projects. With this kind of research, we can gain deeper insight into how to optimize environmental policies in similar large development projects in the future.

Disclosure statement

No potential conflict of interest was reported by the author(s).

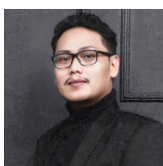
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