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Systematic study of political ecology and the role of local community in the development of the Ibu Kota Nusantara

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ABSTRACT

Background: The development of the Indonesian Capital City (IKN) represents a transformative initiative aimed at relocating the capital from Jakarta to East Kalimantan to mitigate environmental degradation and promote equitable regional growth. This study investigates the ecological and social implications of IKN development by reviewing relevant literature and emphasizing the role of local communities and pentahelix collaboration in fostering sustainable outcomes. Methods: A systematic literature review was conducted using PRISMA and SALSA methodologies to screen 215 articles, of which 15 met the inclusion criteria for detailed analysis. Findings: The review revealed significant challenges—including ecological disruption, social inequality, and the marginalization of indigenous rights—while identifying pentahelix collaboration as a critical mechanism for integrating efforts from government, academia, the private sector, media, and community stakeholders. Conclusion: The study concludes that enhancing pentahelix collaboration and empowering local communities are essential for mitigating adverse impacts and achieving sustainable, inclusive development in the IKN context. Novelty/Originality of this article: This research introduces a novel framework that links political ecology with social justice and ecological sustainability, offering innovative insights for policy interventions that prioritize long-term equity and environmental stewardship.

KEYWORDS: political ecology; geography; sustainability.

1. Introduction

The development of the Indonesian Capital City (IKN) is an ambitious initiative by the Indonesian government to relocate the nation's capital from Jakarta to East Kalimantan. This project aims to redistribute development more evenly and reduce the burden that has been borne by Jakarta, especially related to population density and increasingly severe environmental damage. Jakarta has long faced serious problems related to congestion, air pollution, and inefficient waste management (Kurniawan et al., 2024). For example, studies show that the relocation of the capital is expected to reduce Jakarta's high-risk dependence on climate change. However, the relocation of the capital also brings major challenges in terms of social sustainability and natural resource management. Relocation carried out without careful consideration of social sustainability can exacerbate the inequality between more developed and less developed regions, and cause more severe environmental damage if management is not carried out wisely (Mocc et al., 2023). Therefore, a deeper understanding of ecological and social sustainability is essential in every policy

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implemented, so that there are no long-term negative impacts (Wahyu & Frinaldi, 2024a). Social and ecological sustainability is an integral part of the IKN development planning. Effective collaboration between the government, society, business world, academics, and the media is important to realize this sustainability within the pentahelix framework (Saraswati & Adi, 2022). On the other hand, several studies highlight the importance of the role of local communities and indigenous peoples, which are often overlooked in decisionmaking related to the management of natural resources and space (Armies et al., 2022; Handoko & Rohmah, 2023; Nugroho, 2022). Although there is awareness of the importance of pentahelix collaboration, most of the existing literature is still focused on development policies or theories without delving into the practical implementation of such collaboration in the context of the IKN (Nurahmani & Sihombing, 2022). This paper aims to fill the existing research gap, by examining the long-term social impacts and real contributions of pentahelix collaboration in the development of the IKN. Through this paper, it is hoped that novelty can be found in a more holistic approach to the development of the IKN that not only prioritizes ecological sustainability, but also social sustainability through the empowerment of local communities and indigenous peoples. In addition, this paper aims to develop a pentahelix collaboration model that can be applied in the management of IKN development in order to achieve fair, sustainable, and inclusive development.

2. Methods

In this study, the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method was used to identify relevant literature on indigenous peoples, local communities, and the development of the Indonesian Capital City. The PRISMA method is an approach often used in scientific literature to conduct systematic literature reviews with the aim of reducing the possibility of subjectivity in selecting and analyzing literature (Page, et al., 2021; Page, Moher, et al., 2021; Park et al., 2022). By combining the SALSA (Search, Assessment, Synthesis, and Analysis) framework, this study aims to filter and evaluate the relevance of the literature objectively and thoroughly, ensuring that this study is not only comprehensive, but also reduces the potential for bias (Mardani-Nafchi et al., 2024; Park et al., 2022).

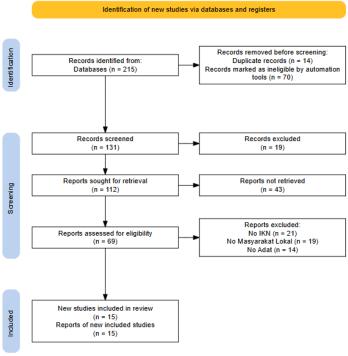


Fig. 1. Research location

The identification process began with a literature search using Google Scholar, with the keywords "indigenous people", "local people", and "Indonesian Capital". From the initial search, a total of 215 relevant journals were found. Furthermore, a screening process was carried out to eliminate literature that did not meet the inclusion criteria, such as those that did not focus on the topics of social sustainability, spatial management, or the impact of development in the IKN. After the initial screening stage, only 15 journals met the eligibility and relevance criteria for further analysis. This screening process followed the standardized procedure in PRISMA, which consists of four phases: identification, screening, eligibility, and inclusion (Mengist et al., 2020).

The PRISMA method is expected to produce a more rigorous, structured, and bias-free analysis, as well as provide deeper insights into how social sustainability and natural resource management can be integrated into IKN development. In addition, the PSALSAR approach, which combines protocols and reporting, is also applied to ensure that the synthesis and analysis process of existing literature is carried out with high methodological rigor. By using this framework, this study is expected to provide stronger and more relevant findings in the context of sustainable development in IKN, by highlighting the importance of pentahelix collaboration and local community empowerment in creating equitable and inclusive development.

3. Results and Discussion

3.1 Trend of topic

Based on the visualization of the main topics of the 15 journals analyzed, several major themes dominate the discussion trends related to the development of the IKN, namely sustainability, local communities, indigenous communities, land, and infrastructure. The theme of sustainability highlights the importance of maintaining the ecological ecosystem and social sustainability in the development of the new capital city, especially in relation to the long-term impacts on local and indigenous communities. Land is a central issue because many journals discuss conflicts related to state land permits, customary land rights, and spatial management within the framework of sustainable development. In addition, the theme of local community participation and empowerment of indigenous communities is also a major concern, especially in ensuring social justice and inclusion in decision-making.



Fig. 2. Trend of topic

In addition, there is a trend of discussion that highlights infrastructure as a key tool to drive economic and social transformation in the capital city, including the use of digital technology and green infrastructure that support the principles of sustainability. This theme is often associated with environmental impacts, where the focus on legal protection and natural resource management are significant topics. Overall, this trend shows that the literature related to capital city development tends to pay great attention to the integration

of political ecology, sustainability, and social justice, with cross-sector collaboration being a key element in realizing these goals.

Table 1. Number of receptors in each container

Journal Writer	Political	Social	Environmental	Public	Legal Regulation
	Ecology	Justice	Sustainability and	Participation	and Protection of
			Ecological Impact	and	Local Community
				Democracy	Rights
(Afifuddin et al., 2023a)	V	V	V	V	V
(Darman et al., 2024)	X	V	X	V	V
(Nugroho, 2022)	V	V	V	V	V
(Jade et al., 2020)	V	V	V	V	V
(Siahainenia et al., 2023)	X	V	V	V	V
(Saraswati & Adi, 2022)	V	V	X	V	X
(Mocc et al., 2023)	X	V	V	V	X
(Mulyadi et al., 2024)	X	V	V	V	X
(Kurniawan et al., 2024)	V	V	V	V	V
(Nurahmani & Sihombing, 2022)	V	V	X	V	V
(Irwansyah et al., 2024)	X	V	V	V	X
(CAY Al Ghifari & Kurniawan, 2024)	X	X	V	X	V
(Amri & Lessy, 2024)	V	V	X	V	V
(Khair, 2022)	V	V	X	V	V
(Wahyu & Frinaldi, 2024b)	V	V	V	V	V

Furthermore, based on the classification of the 15 journals that have been analyzed, there are several main themes that are relevant to the study of political ecology on social justice in the context of the development of the Indonesian Capital City (IKN). These themes can be categorized into five main areas: Natural Resource Management and Political Power, Social Justice and Equitable Development, Environmental Sustainability and Ecological Impact, Community Participation and Democracy, and Legal Regulation and Protection of Local Community Rights. First, natural resource management and political power emerged as important themes, with 8 journals discussing how government policies in managing natural resources, land, and space in East Kalimantan can affect local communities and ecosystem sustainability. The government, as the main actor, has a major role in determining the allocation of space and management of natural resources that can cause ecological injustice if they do not accommodate the interests of indigenous and local communities. Second, social justice and equitable development are very dominant themes, with all 15 journals discussing the importance of equitable distribution of development benefits to local communities, their empowerment, and avoidance of marginalization. In the context of the IKN, social inequality can increase if the policies implemented do not pay attention to the needs of local communities, especially in terms of access to land, jobs, and natural resources. Empowering local communities is one of the keys to ensuring that development provides equitable and fair benefits.

Furthermore, environmental sustainability and ecological impacts are also central issues, with 9 journals highlighting how the impact of IKN development can affect the ecosystem in East Kalimantan. Development that does not pay attention to ecological sustainability can damage the environment and affect the lives of communities that depend on these natural resources. Therefore, many journals propose policies that integrate sustainability principles into every stage of development planning and implementation. The theme of community participation and democracy also appears in all 15 journals, indicating the importance of community involvement in planning and decision-making related to IKN development. Democracy and local community participation are key elements in ensuring that IKN development does not only benefit certain parties, but also provides opportunities for communities to play an active role in influencing policies that directly impact their lives. Finally, legal regulations and protection of local community rights are raised in 13 journals as important elements in IKN development. Protection of community rights, especially their rights to land and natural resources, must be a priority in development policies. Many journals emphasize the importance of clear and firm legal regulations to prevent social and economic conflicts that may arise from the relocation of the nation's capital.

Overall, this analysis shows that social justice and community participation are the most dominant themes, indicating that almost all journals emphasize the importance of community involvement in the development of the capital city and how the development must be carried out fairly and equitably. In addition, political ecology and environmental sustainability are also important issues discussed, with many journals focusing on spatial management and the ecological impacts arising from this large project. Therefore, to achieve sustainable and equitable development, all of these aspects must be considered in a balanced manner, ensuring that the development of the capital city not only prioritizes economic growth, but also pays attention to social, ecological, and legal aspects.

3.2 Politics of natural resources and space management in IKN

One of the main aspects in the study of political ecology in the IKN is the management of space and natural resources and how government policies affect socio-ecological inequality. In several journals, there is a discussion about the management of public space and the transfer of land rights in the IKN, which often involves social conflicts between the government and indigenous or local communities. For example, in a journal that examines the urgency of developing public space in the IKN, it is explained that inclusive management of public space is very important to avoid neglecting the rights of local communities (Affuddin et al., 2023a). The government plays an important role in designing public spaces that not only function as social places, but also as a means for the community to participate in the development process. This indicates that space management must be more open and fair, considering the many marginalized groups, such as indigenous communities who are often not involved in decision-making regarding land or space use.

In several other journals, especially those discussing the protection of indigenous peoples' rights and state land permits, it is explained that the management of natural resources, especially land, is greatly influenced by existing political power. The journal on the protection of indigenous peoples in the process of moving the nation's capital city reveals that spatial politics in the IKN tends to ignore the rights of indigenous peoples to the land they have managed for generations (Armies et al., 2022; Darman et al., 2024; Handoko & Rohmah, 2023; Junaidi, 2024). Government policies in managing space often clash with customary land rights which threaten the social and ecological sustainability of these communities. State land permits that do not side with local communities often cause major ecological damage, especially when natural resource management does not consider aspects of environmental sustainability.

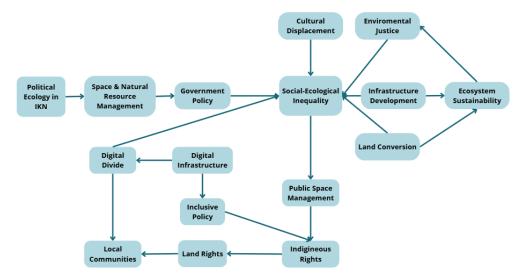


Fig. 3. Diagram of the relationship between political ecology, social justice, and sustainability in The IKN

In terms of state land management, several journals highlight how the policy of transferring land rights for the development of the IKN has the potential to marginalize local communities. Government policies in limiting the land rights of local or indigenous communities for the benefit of infrastructure development or the administrative area of the new capital city are often not accompanied by adequate protection for the affected communities. In this case, state land management policies that do not prioritize the empowerment of local communities risk exacerbating social inequality, with local communities losing access to land and space that are an integral part of their lives (Armies et al., 2022; Simarmata, 2023). In addition, ecological damage caused by land conversion also has a major impact on the sustainability of local ecosystems. For example, land clearing for the development of the IKN can damage the forest ecosystem that has been maintained by indigenous communities, which affects not only their social lives but also the ecological sustainability of the area.

One of the important findings in several journals is that the management of customary space is not only related to ecological aspects, but also to social sustainability. In a journal that examines the determination of customary space in the IKN, it was found that policies that ignore the recognition of customary space can cause cultural disposition and social damage to indigenous communities (Armies et al., 2022; Firnaherera & Lazuardi, 2022; Tinambunan, 2024). Spatial management based on the recognition of indigenous peoples' rights is very important to ensure social sustainability. If the government ignores customary space rights and does not involve the community in the planning and management of space, there will be greater social injustice, and ecological damage due to land conversion will be even worse.

Another paper, which examines natural resource management related to the relocation of the capital city, shows how government policies in managing natural resources around the capital city area have the potential to cause ecological injustice (Irmawan et al., 2023; Putri et al., 2024). When natural resource management focuses more on infrastructure development without considering its impact on local communities, the end result can be very detrimental to communities that depend on these natural resources. For example, policies that do not take into account the social and ecological impacts of green infrastructure development or water management can cause communities living around the capital city area to be marginalized and lose access to the resources they previously managed.

Several other journals examine how the development of digital infrastructure in the capital city can worsen economic inequality if not carried out inclusively (Mocc et al., 2023).

Although technology can provide economic opportunities for local communities, without policies that support equal access to technology, there is a risk of creating a wider digital divide between central and peripheral areas. Journals discussing digital economic infrastructure in the capital city state that equal access to technology and resources must be a priority in development policies so that the benefits of digital transformation can be enjoyed by all levels of society, not just by a handful of groups that are already more economically advanced (Ariansyah et al., 2024; Hapriyanto & Azmi, 2024; Mocc et al., 2023).

3.3 Social justice in IKN development: participation of local communities and indigenous communities

One of the main aspects raised in the study of social justice in the development of the IKN is the active participation of local communities in the planning and implementation of major projects. Figure 4 is a radar diagram that illustrates key aspects of social justice in the development of the Indonesian Capital City (IKN). This diagram shows the level of attention to important indicators that influence social justice, such as local community participation, inclusiveness of public space, indigenous peoples' rights, access to land, social inequality, economic digitalization, and government policies. The radial scale in the diagram measures the level of attention from low to critical, with blue lines connecting these indicators to represent current achievements or focus.

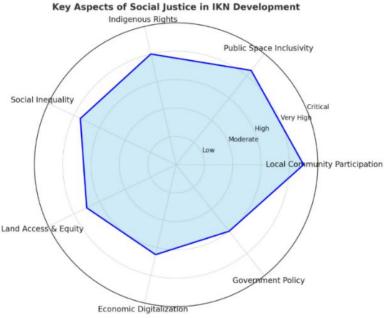


Fig. 4. Radar diagram regarding key aspects of social justice in the development of the indonesian capital city (IKN)

Indicators of local community participation and inclusiveness of public spaces are at a very high level of attention, emphasizing the importance of active community involvement in the planning and implementation of IKN development. Several journals emphasize that inclusive public spaces are key to ensuring that local communities have equitable access to public facilities that are built. However, in practice, community involvement is often symbolic and does not have a significant impact on policy making (Affuddin et al., 2023a; Gunawan et al., 2024). This shows that policies still favor investment interests and rapid development, while the needs of local communities, such as land rights and social sustainability, are often neglected.

Furthermore, the indigenous peoples' rights indicator also shows quite high attention. Journals discussing indigenous peoples' rights highlight that the relocation of the capital city has the potential to threaten their social and cultural sustainability. Indigenous peoples

who depend on land for economic life and cultural activities are often not involved in decision-making, thus losing access to resources that have been managed sustainably (Armies et al., 2022; Nugroho, 2022). This situation exacerbates social inequality which is also seen as an important indicator in the diagram, where land conversion and non-inclusive policies trigger conflict and worsen people's access to equitable resources.

Other indicators such as land access and equity and economic digitalization are at a moderate level of attention. The issue of land access is crucial because land conversion policies often favor private sector interests, while local and indigenous communities are marginalized without fair compensation (Firnaherera & Lazuardi, 2022; Rifiyanti et al., 2024). At the same time, journals related to economic digitalization show that although technology can open up new economic opportunities, the digital divide between central and peripheral communities can exacerbate inequality if there are no policies that support equal access to technology (Hapriyanto & Azmi, 2024; Mocc et al., 2023).

Finally, government policies also play an important role, but attention to this indicator still needs to be strengthened. Policies that focus on accelerating development often ignore the principle of social justice, where local and indigenous communities do not get enough space in the planning process (Jade et al., 2020; Haq & Suhartono, 2024). Therefore, to achieve social justice in the development of the IKN, the government needs to strengthen policies that are more inclusive, transparent, and based on active participation. Thus, this diagram represents the main challenges in creating social justice in the IKN, where local community participation, protection of indigenous peoples' rights, and fair policies are key aspects that need to be improved. The development of the IKN must ensure that its benefits can be enjoyed equally by all levels of society, not just by certain groups, in order to create sustainable and equitable development.

3.4 Ecological and social sustainability in IKN development

Ecological and social sustainability is one of the main pillars in creating sustainable development in the Indonesian Capital City (IKN). In this context, sustainability does not only refer to environmental aspects, but also to social welfare that involves the active participation of local communities and indigenous peoples. Based on a study of 15 journals that have been analyzed, a number of challenges and solutions can be found related to how IKN development can continue by considering environmental sustainability and social empowerment simultaneously.

Figure 5 is a visualization of the concept of pentahelix collaboration in creating social and ecological sustainability in the development of the Indonesian Capital City (IKN). This diagram places the government, society, academics, private sector, and media as the main pillars that support the management of justice-based space, social sustainability, and ecological sustainability. The triangle in the middle of the diagram reflects three important interrelated aspects, namely fair space management, social sustainability, and ecological sustainability, where collaboration from the five pentahelix actors is key to achieving it.

On the right side, important indicators such as recognition of customary rights, social justice, policy transparency, local community empowerment, ecological justice, land conflict resolution, access to public space, multi-stakeholder participation, and control of land conversion are presented as the main factors that need to be considered in the development of the IKN. Pentahelix collaboration is a relevant approach to addressing various challenges in this development, such as space and resource conflicts, neglect of indigenous peoples' rights, and environmental damage due to land conversion.

In the context of ecological sustainability, several journals discussing the environmental impacts of the development of the capital city emphasize the importance of developing green infrastructure, including renewable energy, water management, and waste management based on environmentally friendly technologies (Agilita & Fevriera, 2024; C. Y. Al Ghifari & Kurniawan, 2024; Handoko & Rohmah, 2023; Irmawan et al., 2023; Putri et al., 2024; Robby et al., 2024; Wahyu & Frinaldi, 2024b). Journals reviewing the environmental impact analysis of the capital city show that despite the push to build a more

efficient and modern capital city, dependence on fossil fuels and large infrastructure development can lead to wider ecological damage (Wahyu & Frinaldi, 2024b).

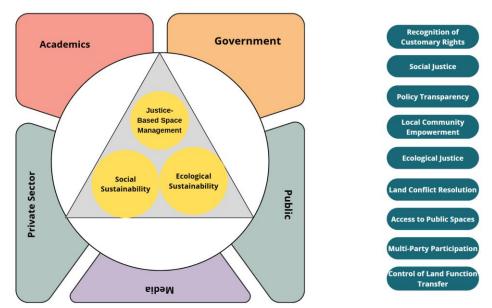


Figure 5. Visualization of the pentahelix collaboration concept in creating social and ecological sustainability in the development of the indonesian capital city (IKN)

Other On the other hand, the journal on state land permits in Balikpapan revealed that development that does not consider ecological sustainability has the potential to worsen damage to local ecosystems, especially forests and natural resources that are traditionally managed by local and indigenous communities (Jade et al., 2020). Without policies that prioritize environmental sustainability, the development of the IKN could cause damage to the highly biodiverse ecosystem in Kalimantan. Therefore, the integration of green technology and sustainable infrastructure in development plans must be prioritized to reduce carbon footprints and preserve nature.

Furthermore, social sustainability in IKN involves empowering local communities and providing equitable social benefits from development projects. One of the important issues raised in the journal on community participation is how local and indigenous communities can be empowered in the planning and decision-making process related to land and natural resource use (Heryansyah, 2024; Mulyadi et al., 2024). Local community participation is essential to ensure that they are not just spectators in the development process, but can also feel the benefits directly, both economically and socially.

The journal on the protection of indigenous peoples' rights reveals major challenges related to forced evictions that may occur as a result of the development of the capital city (Nugroho, 2022). Indigenous peoples who depend on the land for their livelihoods are often not involved in the planning process or are not given fair compensation (Armies et al., 2022). Without the recognition of indigenous rights and their empowerment in development policies, social inequalities can widen, with indigenous peoples being marginalized and not having access to the benefits of development (Rifiyanti et al., 2024). Therefore, sustainable capital city development must take into account the rights of local communities and provide them with space to be involved in decision-making and the distribution of development benefits (Armies et al., 2022; Darman et al., 2024; Junaidi, 2024).

In the study of political ecology in the Indonesian Capital City (IKN), several journals explicitly or implicitly raise the importance of pentahelix collaboration in sustainable development. Pentahelix collaboration, which involves the government, society, academics, the private sector, and the media, is a relatively new concept but is very relevant in the context of IKN development that involves many parties with different interests. For example, a journal on state land licensing in Balikpapan emphasizes the importance of

cooperation between the government and the private sector to ensure fair and sustainable management of natural resources (Jade et al., 2020). In this context, the government and the business world must work together in infrastructure development, while maintaining ecological sustainability and empowering local communities. Although this journal does not explicitly mention pentahelix, the collaboration involving these two sectors reflects the principle of collaboration to achieve social sustainability.

Furthermore, in a journal discussing the protection of indigenous peoples' rights, it was revealed that indigenous peoples living in the IKN area are often marginalized in land development policies (Afifah et al., 2024; Armies et al., 2022; Darman et al., 2024; Nugroho, 2022). However, this journal recommends that the government collaborate with indigenous peoples, academics, and the private sector to ensure that land use policies not only benefit certain parties, but also involve the most affected parties, namely indigenous peoples. This shows that collaboration between the government, indigenous peoples, and academics is essential to developing policies that are inclusive and based on social sustainability.

However, despite several examples of the importance of collaboration between these sectors, not all journals in this review directly refer to pentahelix collaboration as a structured concept. Most still focus on the role of the government or private sector, while the participation of local communities and academics is often limited to theoretical studies or policy recommendations without looking at more real collaborative practices in the field. This is a major limitation in this review, where there is still much room to explore how collaboration between sectors can run more effectively and synergistically in the implementation of IKN development policies.

As a further evaluation, several future research agendas need to be prioritized. First, further research that highlights the long-term social impacts of the relocation of the national capital on indigenous peoples and local communities is essential to explore the social changes that occur as a result of this policy, as well as to identify solutions to reduce social inequality and ecological damage. Second, more detailed research on pentahelix collaboration needs to be conducted to understand how collaboration between government, communities, the private sector, academics, and the media can improve social and ecological sustainability. This research should include an evaluation of effective collaboration models and how each party can contribute to ensuring that the development of the IKN does not only benefit certain parties, but also creates equitable benefits for all parties. Third, a research agenda that focuses on sustainable development using green technology and environmentally friendly infrastructure needs to be prioritized to reduce the impact of ecological damage that may occur as a result of this large-scale development.

From this study, there are several findings that provide important novelties in the study of political ecology in the IKN. First, social and ecological sustainability does not only depend on government policies, but also on how the development of the IKN is integrated with the empowerment of local communities and indigenous peoples. This finding suggests that natural resource and space management policies must prioritize active community participation to ensure social justice and ecological sustainability. Second, pentahelix collaboration emerged as a novelty in this study, where cooperation between the public, private, academic, community, and media sectors proved to be the key to creating more equitable and inclusive sustainable development. This collaboration can overcome major challenges in natural resource management, which is often a critical point in the development of the IKN. Third, this study highlights that the empowerment of local and indigenous communities is very important in achieving social sustainability in the IKN. Policies that ignore customary land rights and local community access to natural resources risk exacerbating social inequality. Therefore, it is important for the government to ensure that every policy taken considers social justice for all communities affected by the development. Thus, this study provides a new contribution in the field of political ecology, emphasizing the importance of a holistic approach that combines social and ecological sustainability. As a novelty, this study also introduces the role of pentahelix collaboration in managing the development of a more equitable and sustainable IKN.

4. Conclusions

The conclusion of the Systematic Literature Review (SLR) shows that the development of the Indonesian Capital City (IKN) requires a holistic and inclusive approach, which integrates social and ecological sustainability. Despite government efforts to design development policies that focus on infrastructure and economic growth, the findings show that the participation of local communities and indigenous peoples in decision-making and natural resource management is essential to achieving social justice. This study also identified that pentahelix collaboration between the government, private sector, community, academics, and media can be the key to creating more equitable and sustainable development. Therefore, effective collaboration, followed by empowerment of local communities, is an important step in ensuring that the development of the IKN is not only oriented towards short-term profits, but also pays attention to long-term sustainability for all parties involved.

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Author Contribution

Conceptualization, S.M.; Methodology, S.M.; Validation, S.M. and R.P.T.; Formal Analysis, S.M.; Investigation, S.M.; Resources, R.P.T.; Data Curation, S.M.; Writing – Original Draft Preparation, S.M.; Writing – Review & Editing, R.P.T.; Visualization, S.M.; Supervision, R.P.T.; Project Administration, S.M.

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Data Availability Statement

Not available

Conflicts of Interest

The authors declare no conflict of interest

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