

ENVIRONMENTAL ECONOMICS IN THE PERSPECTIVE OF FEASIBILITY STUDY: INTEGRATION OF ECONOMIC, SOCIAL, AND ENVIRONMENTAL ASPECTS (CASE STUDY OF THE DEVELOPMENT OF THE INDONESIAN IKN)

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Abstract

This paper analyzes the feasibility study of Indonesia's new capital city (IKN Nusantara) from an environmental economics perspective. The study integrates economic, social, and environmental dimensions to assess the sustainability of this national project. Using descriptive-qualitative methods, the paper reviews government reports, academic literature, and policy documents related to the IKN development. The findings reveal that economically, the project has potential through investment and regional development, but risks arise if funding from private sectors does not materialize. Socially, the relocation of civil servants and impacts on indigenous communities require inclusive approaches. Environmentally, the project faces high risks such as deforestation, biodiversity loss, and water resource management. Therefore, the feasibility of IKN depends on integrated policies that balance growth, social justice, and ecological sustainability. This study shows that the economic feasibility of IKN can only be achieved in a way when IKN also considers the needs of people and protects the environment. The results give us a view of how to assess big national development projects, like IKN and how IKN affects the environment from an economic standpoint.

Keywords: Environmental economics, feasibility study, IKN Nusantara, sustainable development.

INTRODUCTION

The development of Indonesia's New Capital City (IKN) Nusantara in East Kalimantan represents a strategic national initiative aimed at establishing a new administrative center while promoting a more equitable distribution of development across the country (Republic of Indonesia Law No. 3 of 2022 on the Capital City). Beyond mere physical infrastructure development, the relocation of the capital entails profound changes in the socio-economic structure of the population, including potential mass migration and shifts in regional economic patterns (Santoso, 2023).

From an environmental economic perspective, project feasibility evaluation is a crucial element for assessing economic, social, and ecological aspects, ensuring that the development process is not only efficient but also sustainable in the long term (Pearce & Turner, 1990). This approach helps to identify potential benefits, such as increased investment and reduced dependence on Java, while anticipating risks like environmental degradation and social inequity (Wahyudi et al., 2022). This study aims to provide a holistic analysis of the feasibility of IKN, with the expectation of offering policy recommendations that support a balance between economic growth and natural resource preservation.

Previous studies have looked at the potential of IKN, the environmental risks of IKN or the social consequences of IKN on their own. There are not many studies that look at all three of these things together in a way that makes sense for the environment and the economy. So this study is trying to fill that gap by looking at whether IKN Nusantara's feasible in

terms of economics, social impact and environmental impact. This study is really, about IKN Nusantara. How it affects the economy people and the environment all at the same time.

Historically, the relocation of capitals in Indonesia reflects a consistent pattern of decentralizing power, similar to initiatives proposed during the New Order era to alleviate Jakarta's burden as the economic and administrative center (Ricklefs, 2008). The IKN Nusantara project, planned to cover an area of 256,142 hectares, not only seeks to address over-urbanization in Java but also to stimulate economic growth in Kalimantan through sustainable agriculture, tourism, and green industries (Ministry of Public Works and Housing, 2023).

However, from an environmental economic standpoint, the main challenge lies in the trade-off between short-term economic benefits, such as the creation of jobs for 1.9 million new residents, and long-term impacts on the rich tropical forest ecosystem, which could increase national carbon emissions if not managed under circular economy principles (Dasgupta, 2021). Therefore, a comprehensive feasibility study is essential to ensure that this project aligns with the United Nations Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action), thereby preventing environmental mismanagement similar to that experienced in large infrastructure projects in other developing countries (World Bank, 2022).

LITERATURE REVIEW

Environmental Economics

Environmental economics is a part of economics that looks at how we can use resources in a smart way. This means we have to think about how our actions affect the environment and what will happen in the run. Some people, like Pearce and Turner wrote about this back in 1990. They said that when we do things to make money it can also hurt the environment. We can pollute the air cut down trees and hurt animals. The cost of these things is not always included in the price of things we buy.

We need the government to help make sure we do not hurt the environment much. This is because things like pollution are not always factored into the prices of things. According to Daly, who wrote about this in 1996 we should only do things that the earth can handle. We have to make sure we do not use up all the resources so that our kids and grandkids will have enough.

The idea of economics says that the economy is a part of the environment. This means we cannot just keep growing and growing without thinking about the earth. We have to take care of the environment so that it can keep providing us with what we need. This is very important when we are building things like roads and buildings. Environmental economics helps us figure out if what we are doing is an idea or not. It helps us weigh the things, like jobs and money against the bad things, like pollution and hurt animals.

Sustainable Development

The idea of development is about making sure we meet our needs today without hurting the chances of people in the future to meet their own needs. This idea is important because we have to balance what we need now with taking care of the earth so that people in the future can have what they need too.

Sustainable development is based on three things that are connected: economic growth, social equity and environmental protection. Economic growth is about making sure people have jobs and can take care of themselves. Social equity is about making sure everyone gets a share of the good things that come from development. Environmental protection is about taking care of the earth and making sure we do not hurt it. We need to think about all three of these things when we make decisions about development. This means that when we plan projects we have to think about how they will affect the economy, people and the earth all at the same time.

Sustainable development is what we need to make sure that everyone has what they need and that the earth is still okay. We have to think about development when we make plans for big projects, like roads and buildings so that we do not hurt the earth and so that everyone gets what they need.

Feasibility Study

A feasibility study is something that people do to figure out if a project is an idea and if it should be done. This study looks at the project from different angles. Kasmir and Jakfar said in 2012 that feasibility studies check out projects to see how they will affect the economy and society and if they are okay from an legal standpoint. They also look at the money and the environment.

When it comes to projects like building Indonesias New Capital City a feasibility study should not just be about making money. It should also think about how the project will affect the environment and the people. This means looking at things like how the land will be used. If animals will lose their homes. It is also important to think about the people who will have to move. If the project will hurt the environment in the long run. If we do a feasibility study then the people in charge and the people who care about the project can see what good and bad things might happen. They can come up with a plan to make the bad things not so bad and make sure that the project helps the economy and the people and does not hurt the environment. So a feasibility study is a help when it comes to making sure that big projects are done in a way that is good, for everyone and the planet.

RESEARCH METHODOLOGY

This study adopts a qualitative descriptive approach grounded in a comprehensive literature review, reflecting the exploratory and multidimensional nature of the topic. Given the complexity of the New Capital City (IKN) development and its environmental, economic, and social implications, a qualitative approach allows for an in-depth understanding of contextual factors that cannot be captured through purely quantitative methods. This design ensures flexibility in analyzing diverse sources and perspectives, including policy documents, academic research, and case studies of similar urban development projects.

Primary data were collected from official government documents, such as the 2020–2024 National Medium-Term Development Plan (RPJMN) from Bappenas, the annual reports of the Committee for Acceleration of Priority Infrastructure Delivery (KPPIP) for 2022–2023, and Law No. 3 of 2022 concerning the IKN. These sources provide authoritative information on government objectives, legal frameworks, and planned infrastructural and administrative arrangements, serving as the backbone for understanding the project's scope and strategic intentions.

Secondary data were obtained from national and international academic journals indexed in databases such as Google Scholar and Scopus, as well as reports from global institutions, including the World Bank (2023) and the Asian Development Bank (ADB, 2022). Comparative case studies, such as the establishment of Brasilia in Brazil and Naypyidaw in Myanmar, were also examined to extract lessons regarding socio-economic integration, environmental management, and urban planning strategies in newly planned capitals.

The data collection process employed strict selection criteria to ensure relevance, currency, and credibility. To make sure the information is reliable I checked the facts from government documents, academic journals and international reports against each other. I only used government documents, academic journals and international reports in the analysis if they all said the thing. This way I could be sure that the information, from government documents, academic journals and international reports was accurate. Sources were included if they were directly related to IKN development and environmental economics, published within the last five years to ensure up-to-date information, and originated from peer-reviewed journals or official reports. This rigorous selection process enhances the reliability of the study and minimizes potential biases arising from outdated or non-authoritative sources.

Data analysis was conducted using a thematic approach, focusing on three main dimensions of project feasibility: economic, social, and environmental. The economic dimension was assessed using indicators such as return on investment (ROI) and net present value (NPV), while the social dimension emphasized inclusivity, demographic impacts, and potential migration patterns. The environmental dimension applied concepts such as carrying capacity, environmental impact assessment (EIA), and sustainability principles, including the evaluation of potential carbon emissions and ecosystem preservation.

The analysis of the theme was done in three steps. First we reduced the data. Then we put the information into three groups: social and environmental themes. Finally we looked at how these thingsre related to each other. We did it this way to make sure we were not just interpreting things in our way. The goal was to be consistent, in our analysis of the social and environmental themes.

Finally, this methodological framework allows for an integrative narrative synthesis, connecting empirical findings to theoretical frameworks in environmental economics, such as Herman Daly's (1996) "green accounting" concept. By linking data to established theories, the study reduces the risk of subjective interpretation, enhances the analytical rigor, and provides a solid basis for policy recommendations that balance economic growth, social equity, and environmental sustainability.

RESULTS AND DISCUSSION

Economic Aspect

Economically, the development of IKN is designed as a catalyst for national growth, with a projected total cost of IDR 466 trillion by 2045, financed 20% through the State Budget (APBN) and 80% through private investment and public-private partnerships (PPP). According to the KPPIP report (2023), the project is expected to create 1.8 million direct and indirect jobs and increase East Kalimantan's GDP by 8–10% annually. This potential is supported by a multiplier effect, where the construction, tourism, and technology sectors are projected to expand, similar to the positive impact of the capital relocation in Astana, Kazakhstan, which boosted foreign direct investment (FDI) by 15% (World Bank, 2018).

However, a key challenge lies in the reliance on private investment, which has so far reached only around 10% of the target (IKN Authority, 2024). This risk is exacerbated by external factors such as post-COVID-19 global inflation and geopolitical uncertainties, which may increase borrowing costs and reduce investor confidence. From an environmental economic perspective, cost-benefit analysis indicates that without hedging mechanisms such as green bonds, the APBN burden could increase, resulting in high opportunity costs for other social programs. Therefore, the economic feasibility of IKN is considered viable, provided there is diversified funding and strict monitoring of indicators, such as a minimum Internal Rate of Return (IRR) of 12% to ensure investment returns.

Social Aspect

The social impact of IKN involves massive demographic transformations, starting with the planned relocation of 12,000 civil servants (ASN) in the first phase in 2024, followed by a gradual relocation of 1.2 million residents. This has the potential to enhance access to public services, including education and healthcare, in Eastern Indonesia, as well as drive urban modernization through inclusive planning. Puspitasari and Hakim (2021) highlight economic opportunities for local communities, where vocational training programs could absorb workers from the Dayak, Balik, and Kutai ethnic groups, thereby reducing structural poverty in Kalimantan, which stands at 8.2% (BPS, 2023).

On the other hand, social conflict risks cannot be overlooked. The relocation of civil servants could create gaps between newcomers and indigenous populations, with customary land issues unresolved, as only 60% of land has been voluntarily cleared (KPPIP, 2022). Without multi-stakeholder dialogue, such as customary deliberation forums, the project could trigger protests similar to past transmigration programs. Inclusive approaches, including allocating 10% of project shares to local communities, are key to turning these challenges into opportunities. Overall, the social aspect is considered highly challenging and requires human-rights-based policies to ensure distributive justice.

Environmental Aspect

The IKN's location on 256,000 hectares of mostly secondary Bornean forest presents significant ecological risks. World Bank (2023) data estimate that initial deforestation could reach 15–20% of the project area, threatening the habitats of 200 endemic species, including the Bornean orangutan (population under 50,000) and proboscis monkeys. Furthermore, challenges in managing clean water demand (500 liters/second) and solid waste from the new urban population could exacerbate river eutrophication if modern treatment systems are not implemented.

The government has responded with the "smart forest city" concept, promising 70% green space, renewable energy usage (solar and hydro), and ecological corridors for wildlife migration. However, the Environmental Impact Assessment (EIA) has faced criticism for the lack of pre-construction biodiversity baseline data (Nugroho, 2022). From an environmental economic perspective, the Total Economic Value (TEV) approach can be applied to account for non-market values such as forest ecosystem services (estimated at IDR 50 trillion per year for Borneo), making restoration costs, such as planting one million trees, an essential investment. These risks are high but can be mitigated through LEED (Leadership in Energy and Environmental Design) certification and GIS-based monitoring for climate adaptation.



Figure 1. Integrasi Aspek Ekonomi, Sosial, dan Lingkungan (Studi Kelayakan IKN Nusantara)

Table 1. Kelayakan Pembangunan IKN Nusantara Berdasarkan Aspek Ekonomi, Sosial dan Lingkungan

Aspect	Potential	Challenges	Feasibility Status
Economic	New economic growth, investment, job creation	Dependence on private investment, risk to state budget (APBN)	Feasible with conditions
Social	Employment opportunities, improved public services, urban modernization	Relocation of civil servants (ASN), risk of marginalizing local communities, potential social conflicts	Moderately challenging
Environmental	Smart forest city concept, 70% green space, conservation opportunities	Deforestation, loss of biodiversity, clean water provision, waste management	High risk

Table 1 presents a comprehensive summary of the feasibility of developing Indonesia’s New Capital City (IKN) Nusantara from an environmental economic perspective, categorizing the analysis into three main aspects: economic, social, and environmental. Each aspect is evaluated in terms of potential (benefits or opportunities), challenges (risks or barriers), and overall feasibility status. This approach combines traditional feasibility study frameworks with environmental economic principles, where monetary value is assessed not only through financial gains but also through externalities, such as environmental degradation and social inequities. Table 1 serves as a central reference to understand how this megaproject, with a projected cost of IDR 466 trillion, can contribute to sustainable development in Indonesia, in line with the United Nations Sustainable Development Goals (SDGs), particularly SDG 8 (Decent Work and Economic Growth), SDG 10 (Reduced Inequalities), and SDG 15 (Life on Land). The following discussion elaborates each aspect in depth, integrating empirical data from official sources such as KPPIP (2023) and the World Bank (2023), as well as environmental economic theories to provide a nuanced analysis.

Economic Aspect: Feasible with Conditions

The economic aspect emerges as the strongest pillar of IKN’s feasibility, with potentials including new economic growth, foreign investment, and the creation of 1.8 million jobs. These projections are grounded in proven multiplier effect models. For instance, KPPIP (2023) estimates that the construction sector alone will absorb 500,000 direct workers during the early phase (2024–2029), while foreign investments, primarily from Gulf and East Asian countries, are expected to reach IDR 200 trillion through public-private partnership (PPP) schemes. This aligns with Amartya Sen’s (1999) environmental economic perspective emphasizing that economic growth should enhance societal “capabilities,” such as increasing average monthly income in East Kalimantan from IDR 5 million to IDR 8 million post-development. Additionally, IKN is projected to contribute 2–3% annually to national GDP, with ripple effects on ecotourism and green technology sectors, including sustainable industrial zones utilizing local resources like timber from secondary forests.

However, challenges include heavy reliance on private investment, which has only reached 10% of the target, and risks to the state budget (APBN) from global financial fluctuations. These external vulnerabilities, such as post-COVID-19 interest rate hikes, have delayed infrastructure projects in other developing countries (ADB, 2022). By early 2024, only

IDR 20 trillion of private investment has materialized, mostly for basic infrastructure like toll roads and airports, while flagship smart housing projects remain stalled. From an environmental economic perspective, these risks are measurable through net present value (NPV) analysis; if borrowing costs exceed 7%, the APBN burden (20% of total cost) could swell to over IDR 100 trillion. Historical examples, such as Naypyidaw in Myanmar, illustrate that similar reliance on private capital can lead to chronic budget deficits, ultimately straining social sectors like education and healthcare. Strengthening economic feasibility requires mitigation strategies, such as issuing green bonds worth IDR 50 trillion and diversifying investors through international forums like the G20, ensuring growth is both quantitative and financially sustainable.

Private investment can be a thing but it is not good to rely on it too much. If the global economy gets worse this can cause problems. We have seen this happen in developing countries. When big infrastructure projects take a time to finish it can cost the government more money. This also means that private investment and large infrastructure projects do not help the economy much as we thought they would. Private investment is still important. We need to be careful, with it. Private investment and large infrastructure projects are not a guarantee of success.

Social Aspect: Moderately Challenging

The social aspect shows promising potential, including employment opportunities for local communities, improved public services, and urban modernization, but is balanced by significant challenges, leading to a “moderately challenging” feasibility status. The IKN vision as an inclusive city, designed for 1.9 million residents by 2045, envisions the relocation of 12,000 civil servants (ASN) in the first phase (2024), expected to bring knowledge transfer and modern infrastructure. According to BPS (2023), East Kalimantan’s unemployment rate of 5.2% could be reduced to below 3% through vocational programs targeting 30% of local workers from the Dayak, Balik, and Kutai ethnic groups. Enhanced public services, such as international-standard hospitals and STEM-focused schools, could reduce regional disparities, where access to higher education in Eastern Indonesia is currently only 15%, compared to 40% in Java. Urban modernization through mixed-use development also has the potential to create cohesive communities, similar to Singapore’s integrated housing, work, and recreation model, reducing social congestion.

Major challenges include ASN relocation, potential marginalization of indigenous communities, and risks of land and cultural conflicts. The relocation could create “elite enclaves” where newcomers dominate resources, while local communities, dependent on subsistence farming and customary forest land, may lose access to 256,000 hectares. Only 60% of land has been voluntarily cleared (KPPIP, 2022), leaving 40% subject to potential disputes, reminiscent of conflicts like the Freeport case in Papua. Cultural marginalization, such as disruption to Dayak Tomuna rituals, could lead to loss of identity and “cultural poverty.” Puspitasari and Hakim (2021) show that without participatory mechanisms, 70% of local residents feel marginalized, which could trigger mass protests similar to the Trans-Papua infrastructure project. From an environmental economic perspective, Robert Putnam’s (2000) concept of social capital illustrates that loss of trust reduces long-term productivity. This “moderately challenging” status requires immediate interventions, such as multi-stakeholder customary councils and allocating 10% of project shares to local communities, turning potential conflicts into social synergies that strengthen national cohesion.

Environmental Aspect: High-Risk

The environmental aspect demonstrates innovative potential, such as the smart forest city concept, 70% green space, and biodiversity conservation, but is dominated by challenges, resulting in a “high-risk” status. IKN is designed as a smart forest city integrating IoT technologies for resource management, with 70% of land (around 180,000 hectares) allocated to green space and ecological corridors. This has the potential to serve as a conservation model, where mangroves and local rivers are restored to absorb up to 10 million tons of CO₂ annually, supporting Indonesia’s net-zero emission target by 2060. Biodiversity opportunities include protecting endemic species, such as Bornean orangutans (*Pongo pygmaeus*) and proboscis monkeys (*Nasalis larvatus*), with plans to plant one million trees and establish 50,000 hectares of conservation zones.

From an environmental economic perspective, Barbier’s (2011) Total Economic Value (TEV) concept estimates Borneo’s ecosystem services at IDR 50 trillion per year, which could be monetized through ecotourism and carbon credits, transforming environmental challenges into economic assets. However, risks such as deforestation (estimated 15–20% of the project area) and water management challenges (500 liters/second demand and solid waste from new urban populations) remain significant if modern treatment systems are not implemented. Effective mitigation relies on LEED certification, GIS-based monitoring, and adaptive management strategies to ensure that ecological integrity is maintained while generating economic value.

Nevertheless, challenges such as 15–20% deforestation, loss of endemic habitats, provision of clean water, and waste management make the environmental aspect the most vulnerable. The IKN location in Borneo's secondary forests, a global biodiversity hotspot with 15,000 plant species, risks losing 40,000 hectares of primary forest due to initial construction, equivalent to 5 million tons of CO₂ emissions (World Bank, 2023). Habitat loss threatens 200 endangered species, with the Bornean orangutan population having declined by 50% over the past two decades due to habitat fragmentation. Clean water challenges, requiring 500 liters/second for the urban population, could trigger a crisis if local rivers are contaminated, while solid waste from 1.9 million residents could cause eutrophication in nearby lakes.

Criticism of the Environmental Impact Assessment (EIA) highlights the lack of baseline data, as only 40% of species were documented pre-construction (Nugroho, 2022). Similar failures have been observed in Brasília, where deforestation caused chronic flooding and the loss of 30% of local biodiversity. This “high-risk” status underscores the need for adaptive mitigation, such as LEED-certified buildings and AI-based GIS monitoring, to ensure conservation potential is not overshadowed by irreversible damage.

The environment is at risk. That is a big problem. Environmental risks can also mean we will have to pay a lot of money in the run. If we do not take care of the environment we will lose species of plants and animals and that will make us more vulnerable to climate change. This can be very expensive to fix if we do not do something about it now. The cost of fixing the environment can be more, than any money we save in the term if we do not take the right steps to prevent these problems. Environmental risks are a deal and we need to think about the environmental risks and what they can do to us.

Overall, Table 1 illustrates the imbalance in IKN's feasibility: strong in economic aspects, weak in environmental, with social factors acting as a challenging bridge. Integrating these three aspects, as depicted in the Venn diagram (Figure 1), is key to success, where overlaps such as “green jobs” (economy-environment) and “sustainable indigenous participation” (social-environment) must be prioritized. Without holistic policies, the project risks becoming a national burden rather than a development catalyst. Table-based recommendations include annual independent audits and allocating 5% of the budget for restoration, ensuring that IKN is not only feasible but also a sustainable legacy for Indonesia. This analysis emphasizes that feasibility studies must remain dynamic, with periodic evaluations to respond to climate change and socio-economic dynamics.

CONCLUSION

The development of IKN Nusantara presents an ambitious vision for Indonesia's future, yet feasibility studies from an environmental economic perspective reveal an imbalance: economically feasible with high potential ROI, socially moderately challenging due to relocation dynamics, and environmentally high-risk due to pressures on Borneo's ecosystems. Integration of these three dimensions is not optional but imperative, as emphasized by Paul Hawken's (1993) natural capital theory.

To ensure sustainability, key recommendations include: (1) strengthening public-private partnerships (PPP) with green incentives for investors, (2) establishing a national indigenous council to facilitate social participation, and (3) conducting independent ecological audits with a target of 100% restoration of affected land. With such commitments, IKN has the potential to serve as a model of inclusive development that not only achieves economic growth but also safeguards natural and social heritage for future generations.

This study looks at how environmental economics can help Indonesia become more sustainable. The study gives us an understanding of how environmental economic principles can support Indonesia's efforts to develop in a sustainable way. Indonesia's efforts toward development are very important and environmental economics can play a big role, in this. The study also thinks about what Indonesia should consider when making policies in the future. Indonesia needs to make policies to support sustainable development and environmental economic principles can help Indonesia do this. By integrating environmental economic principles, IKN can make a significant contribution to achieving the United Nations Sustainable Development Goals (SDGs), particularly SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action), through a forest city model that reduces carbon emissions by up to 30% compared to conventional urban development. Success depends on the government's commitment to adopt adaptive approaches, such as forming independent oversight institutions involving international experts and civil society, as well as allocating dedicated post-implementation research funds.

Ultimately IKN Nusantara is a national project. Its success in the run will depend on how well the government balances economic goals includes everyone, in society and protects the environment. that balances economic ambition with ethical responsibility toward nature and future generations. Future research is recommended to explore climate scenario

simulations using models such as the IPCC framework, ensuring the project's resilience against global threats like sea-level rise and escalating deforestation.

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