

Environmental Geostrategic Analysis in the Development of the Archipelago's Capital City

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Abstract

The development of the National Capital City (IKN) of the Archipelago is faced with major ecological challenges, both because of the existing conditions of Penajam Paser Utara Regency and Kutai Kartanegara Regency and because of the vision of IKN which is green and sustainable. This study aims to analyze the Government's strategy in managing environmental resources and solving existing ecological problems in accordance with the IKN's vision. The research was conducted qualitatively through literature studies from various sources, including academic texts, laws, articles, journals and press conferences from government agencies. It was found that the Government has made various efforts to realize the vision of the IKN and protect the environment such as seeking raw and clean water supplies, managing land, and reclaiming ex-mining pits. But it takes enormous resources to do so, along with good execution, monitoring and evaluation.

Keywords: Geostrategy, IKN, Environment



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INTRODUCTION

The Province of DKI Jakarta has been the IKN of the Republic of Indonesia since 1961 until now. As time goes by, DKI Jakarta Province begins to experience a decline in performance, ranging from environmental degradation to high and uncontrolled population density so that the level of comfort for residents to live in is decreasing. According to Aminullah from WALHI Jakarta (2022), one of the environmental problems in Jakarta is poor air quality. This is shown by the fact that almost every day Jakarta ranks in the top five as the most polluted city in the world based on the air quality index compiled by IQAIR. Furthermore, water quality in Jakarta is also a problem. All 13 rivers that cross Jakarta are at moderate to heavily polluted levels according to the DKI Jakarta Environment Agency (DLH). Apart from river water, groundwater in Jakarta that is used by the community is also heavily polluted (DLH DKI Jakarta, 2020). Thus, it can be said that Jakarta has experienced a crisis in the availability of clean water due to two main water sources being polluted. The next problem is the waste problem in Jakarta, which has entered a crisis phase. Garbage storage in Jakarta has an upward trend, which is shown by the figure of 7,506 tons of waste per day in 2015, then increased to 8,369 tons of waste per day in 2020. In addition, waste management is still in the form of a collect-transport-waste system. without strict and targeted elections (Aminullah, 2022). One of the causes of the decline in performance is economic activity which is very centered on the island of Java, especially DKI Jakarta Province, which causes migration of many migrants from various regions and economic inequality in other islands. Thus, to overcome these matters, the Government of the Republic of Indonesia created the "Archipelago" National Capital (IKN) program which moved the Republic of Indonesia's IKN from DKI Jakarta Province to East Kalimantan Province. The National Capital

(IKN) "Nusantara" is a program of the Government of the Republic of Indonesia to move the IKN which is now in DKI Jakarta Province to East Kalimantan Province. IKN "Nusantara" is located between two districts, namely North Penajam Paser Regency and Kutai Kartanegara Regency in East Kalimantan. According to Bappenas (2020), relocating IKN is a form of strategy for overcoming disparities between regions in Indonesia, efforts to equalize development, and reduce the burden on Jakarta specifically and Java Island in general. According to the IKN Master Plan in the Annex to the IKN Law Chapter I, IKN has a central function and is a symbol of a country in showing its identity as a nation and state. Thus, the relocation and development of IKN requires the principles of well-designed urban development and are based on the long-term vision of the Indonesian nation.

Nonetheless, the concept and plan for the development of the IKN invite various opinions for and against, especially on the social and environmental side (Fristikawati, 2022). Therefore, based on these facts, a geostrategic review needs to be carried out to ensure the correctness and accuracy of the IKN development project in dealing with the current environmental problems in the IKN area. There has been research in the past that has criticized the IKN development plan, an example of which is the analysis of the Forest City IKN concept by Mutaqin, et al. (2021). However, there has been no review from an environmental perspective which is a problem in North Penajam Paser Regency and Kutai Kartanegara Regency, East Kalimantan, and considering the Forest City and Sponge City concept plans. In other words, there has been no study that examines further and compares the concept proclaimed by the government of the Republic of Indonesia in terms of the unsuitability of natural conditions in the target area of the IKN. Thus, this study aims to examine and analyze the suitability of environmental conditions and problems in East Kalimantan with the IKN development geostrategy according to the concepts of Forest City and Sponge City. Forest City is a city concept that uses an integrated landscape approach and is dominated by forest-structured landscapes and green open spaces (RTH). This concept aims to create a life for the residents of IKN that coexists with nature and supports sustainable development by always maximizing carbon sequestration, conserving biodiversity, and improving environmental quality. On the other hand, Sponge City uses a circular water system that combines architecture, urban planning, infrastructure and sustainable principles. The IKN area also plays a role like a sponge that absorbs rainwater, filters it through natural processes and releases water into dams, canals and aquifers. The aim of this concept is the efficiency of the resource system and provide recreational and tourism benefits for the community.

This study begins with an introduction to the IKN and the geographical conditions of the IKN in North Penajam Paser Regency and Kutai Kartanegara Regency in East Kalimantan. Next, the concept of the development of the IKN, as well as the strategy for implementing the vision of the development of the IKN are explained. This concept is taken up in the IKN Master Plan in the Annex to the IKN Law. Furthermore, environmental problems that are currently occurring in the IKN area will be analyzed and studied, and then compared with the development concept of the IKN previously mentioned from the IKN Master Plan. Environmental problems are selected based on the actual conditions of the current IKN area. Environmental issues that are the focus of discussion include high rates of deforestation, contamination of groundwater and surface water due to mining activities, management of mine pits and former mine pits, and the very low use of new and renewable energy (EBT). These four problems are the main issues that are related and relevant to the basic principles of IKN development, and are the main focus of discussion in this study. These four problems will be explained in detail in this study.

This research is expected to contribute as a paper that provides a new perspective on the concept of IKN development, along with its realistic efforts in answering existing problems in

the IKN area. In addition, this research is also expected to participate in advancing the nation's education. The benefit of this research for the community is to broaden their horizons and make the community more critical in analyzing government decisions related to the development of the National Science Institute, especially regarding its suitability with environmental issues. Moreover, geostrategic analysis of environmental aspects is expected to increase public awareness regarding the impact of the IKN development on natural resources and the lives of the people of East Kalimantan Province who are directly affected by environmental problems and the concept of the IKN development. It is also hoped that the Government of the Republic of Indonesia can take this study as a basis for further consideration to review, improve, and develop IKN development projects so that they become more comprehensive and in accordance with the needs of society and the environment in the IKN area, and also support the principles of sustainability for the future. a better Indonesian nation. Thus, this research is expected to provide benefits to the people of Indonesia and the Government of the Republic of Indonesia.

RESEARCH METHODS

The research method used is Qualitative Research with a descriptive-analytical literature research method, which is carried out without basic assumptions or propositions, but begins with an outline of thoughts and issues that will be studied further. The literature method is a data collection method used in social research methodology to trace event record data. Literature sources used as references in this research are laws, articles, journals, books, regulations, and other online literature related to the topic being explored.

RESEARCH RESULTS AND DISCUSSION

Indonesia's National Capital at a Glance

The IKN "Nusantara" area is administratively located between two regencies, namely North Penajam Paser Regency and Kutai Kartanegara Regency in East Kalimantan (Kaltim). The IKN area is in a strategic location, namely to the north of Balikpapan City and to the south of Samarinda City with a land area of approximately 256,142 hectares and a sea area of approximately 68,189 hectares.

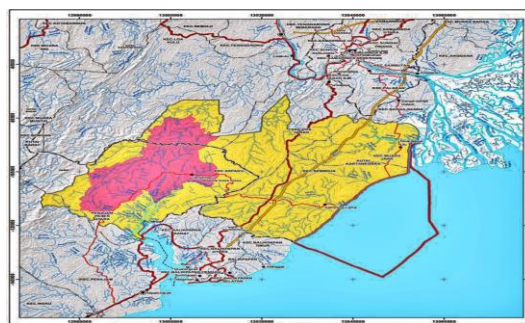


Figure 1. Map of the "Archipelago" National Capital Region (Ministry of National Development Planning/Bappenas, 2019)

The Nusantara IKN area to be developed is quite close to the Mahakam River which is dominated by peat forest and is the natural habitat of the local freshwater dolphin (*Orcaella brevirostris*) known as the Mahakam dolphin. The quantity of water in East Kalimantan is quite large due to the Mahakam River and relatively high rainfall. The average annual rainfall in the Mahakam River area is 2,732 mm/year with a minimum rainfall range of 648 mm/year and a maximum of 4,419 mm/year (Bappenas et al., 2020).

Not only Mahakam dolphins, the East Kalimantan BKSDA recorded at least 90 species of animals living in the Tahura (Great Forest Park) of Bukit Soeharto. Of the 90 animal species, there are two species with endangered status and seven species with vulnerable status which are classified as endangered animals on the red list of the International Union for Wildlife Conservation (IUCN). The two species with endangered status are the rock caladi bird (*Meiglyptes tristis*) and gibbons (*Hylobates muelleri*) and the 7 animals with vulnerable status include sun bears (*Helarctos malayanus*), macaque monkeys (*Macaca nemestrina*), and wild boar (*Sus barbatus*).

The regional characteristics and great potential of East Kalimantan which have been mentioned are the basis for selecting the planned IKN development area. Based on the Pocket Book for Relocating the State Capital, there are several reasons why IKN was moved to East Kalimantan:

1. The accessibility of a high location with the City of Balikpapan and Samarinda allows investment in the development of a more efficient IKN and the formation of a sustainable city ecosystem with IKN.
2. Heterogeneous and open population structure with low potential for conflict in East Kalimantan makes IKN a good reflection of the identity of the Unitary State of the Republic of Indonesia, increases the success of IKN development through the support of local communities, and opens opportunities for the development of the tourism sector as an economic driver.
3. The defense and security of the area is guaranteed because of the Three Dimensions of Land, Sea and Air, and is considered safe and minimal from natural disasters.
4. Availability of large land with the status of Production Forest (HP) and plantations, as well as moderate land capability for building construction can be an initial development capital that reduces the cost of building IKN in East Kalimantan.
5. The area is equipped with main infrastructure, namely the Balikpapan-Samarinda and Trans Kalimantan Toll Roads, Sultan Aji Muhammad Sulaiman Sepinggan International Airport and Aji Prince Tumenggung Pranoto International Airport, Kariangau Container Terminal Port in Balikpapan and Semayang Port in Samarinda.
6. Abundant raw water is available from 3 existing reservoirs, 2 planned reservoirs, 4 rivers, and 4 watersheds (DAS).
7. The strategic location of East Kalimantan, namely in the middle of the Republic of Indonesia (symbolic) and in the Indonesian Archipelagic Sea Lanes (ALKI) II Makassar Strait so as to facilitate international shipping and flight activities.

IKN Development Concept

The development of the IKN area is divided into 3 planning areas, namely: Central Government Core Area (KIPP) with an area of around 6,671 ha. The IKN area (KIKN) has an area of around 56,180 ha. IKN Development Area (KP IKN) with an area of around 199,962 ha. According to the IKN Master Plan in the Appendix to the IKN Law Chapter III, there are three basic principles that form the norms for governing KRI's IKN in the future. The three principles are Forest City and Sponge City in terms of environment, and Smart City in terms of infrastructure.

A forest city (Forest City) is a city that applies an integrated landscape approach and is dominated by a landscape structured forest and green open space (RTH) which aims to create life side by side with nature and support sustainable development by maximizing carbon absorption, conserving biodiversity, and improve environmental quality. Because the IKN area has forest areas and high biodiversity, the planning and development of the IKN is focused on

aligning the cultivation and protection functions, especially in forest areas, including protecting, maintaining and restoring forests in the IKN.

The principles of the City of Forests include: conservation of natural resources and animal habitats; connected to nature; low carbon development; provision of adequate water resources; controlled development (anti-sprawl development); and involve the community. Sponge City (Sponge City) has a circular water system that combines architecture, urban design, infrastructure, and sustainable principles. Sponge cities function as rainwater absorbers, natural filters, and water conduits to canals, aquifers, and dams. The goal of Sponge City is resource system efficiency and providing recreational benefits to the community. Sponge City has 3 principles, as follows:

1. City of the archipelago (Archipelago City). Green and blue corridors are the foundation of city-forming structures, namely connecting cities to nature, mountains to the ocean, integrated into urban design to maintain and preserve biodiversity and support the availability of clean water.
2. Absorbent City. At the district scale, the green and blue corridors will capture urban runoff which is collected and channeled into city parks. City parks are designed as green open spaces that act like sponges, so that rainwater is absorbed and collected as groundwater which is channeled into ecological corridors as clean water.
3. Integrated city (Integrated City). Elements in the kelurahan up to the block are designed to slow down the flow of water, collect rainwater, increase soil absorption and contribute to improving the habitat environment.

The National Capital of the Archipelago (IKN) has a central function and will be used as a symbol of a country to show the identity and identity of the Indonesian nation in the eyes of the world. Thus, IKN was built with the vision of being a 'World City for All' which not only represents the people who will live in IKN, but also the environmental conditions in the IKN area that will be restored and maintained..

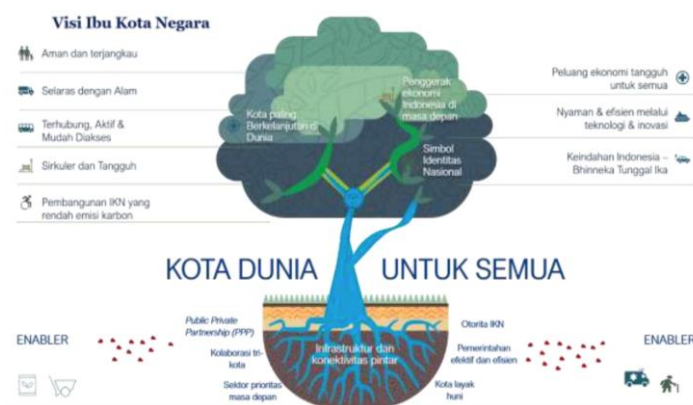


Figure 2. Vision of the National Capital City "Archipelago" (Ministry of National Development Planning/Bappenas, 2019)

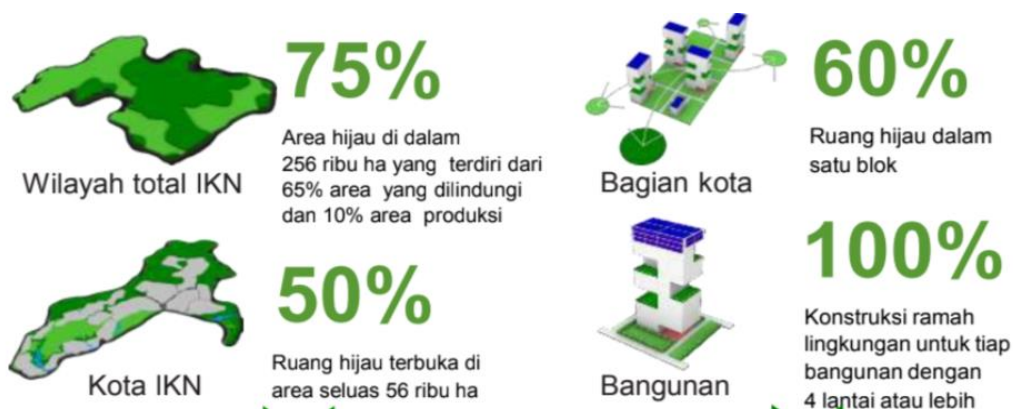
One of the benefits of IKN which is closely related to the environment is 'the availability of large land can build a new capital city with green areas that are more dominant than built-up areas'. The three main goals of IKN include symbols of national identity, sustainable cities in the world, and driving the Indonesian economy in the future. A sustainable city in the world is a city that manages resources efficiently and provides effective services through the efficient use of water and energy resources, waste management, integrated transportation, a livable and healthy environment, and the synergy of the natural and built environment.

IKN problem

The government has a big vision for the Archipelago, starting from overcoming existing problems, sustainable development in accordance with natural conditions, low carbon emissions, and circular resource management. However, many parties have shown concern that the development of the Archipelago will only add to the ecological burden of the Nation and does not have a solid foundation, but is only an escape from the Government's environmental problems in Jakarta, such as the projected sea level rise as high as 2.88 m which could submerge Jakarta in 2030 (Anggraini et al., 2012).

This cannot be separated from the ecological challenges in the prospective IKN area, which according to the Strategic Environmental Assessment (KLHS), include high levels of deforestation, endangered biodiversity, sources of raw water and clean water polluted by mining activities, very low use of new renewable energy, as well as a food deficit. If not handled properly, these problems can reduce not only the quality of human life, but also further degrade the ecology of the IKN area.

According to the KLHS, forest cover in North Penajam Paser and Kutai Kartanegara has decreased to 42.3% due to mining and plantations. To prevent further degradation and promote sustainability, the IKN authority is targeting more than 75% green area in the IKN area, i.e. 65% protected area and 10% food production area.



Gambar 3. Strategi Penggunaan Lahan Ibu Kota Negara “Nusantara” (Bappenas, 2019)

According to the IKN master plan, this green area includes forests, ecology and animals, roof gardens, subsistence farming, ecotourism, and botanical gardens, which is realized through the rehabilitation and reforestation of 50% of oil palm and mining land whose concessions expire, and is targeted for completion in 2045 This is based on the Forest City principle, which is expected to address the problem of deforestation and forest fires.

According to Poorter et al. (2021), tropical forests have a high ability to recover after deforestation. Soil fertility and ecosystem function in general were observed to recover after only 10-20 years. In detail, soil fertility is predicted to recover after 10 years, plant function in 60 years, and soil surface biomass and species composition after 120 years. However, this estimate still depends on the intensity of previous land use and the presence of forest in the vicinity which can trigger growth. This natural method is considered more cost-effective and environmentally friendly, and human intervention such as reforestation should only be carried out when it is urgently needed, taking into account the forest ecosystem as something complex and interrelated, and different for each forest. Government strategies for active reforestation may be quicker than letting forests recover on their own, but can change existing indigenous ecosystems. Moreover, it is feared that the intensive development that will soon be carried out at the IKN will hamper the re-growth of forests, especially with the condition of polluted water

sources. Keep in mind that environmental policy-making must fulfill 8 aspects, namely holistic, careful, reversible, preventive, not too resource-intensive, ensuring polluters are responsible, fair, and balanced between socio-economic and environmental (Spoolman, 2016). Can be studied further the most appropriate method to restore green space.

The second problem is contamination of ground and surface water mainly due to mining activities. Even though the volume of surface water is high, its distribution is uneven, so many people still use groundwater for irrigation and consumption. With a high level of pollution, this water cannot be used properly. To overcome the clean water crisis problem, the Ministry of Public Works and Public Housing has built the Sepaku River Intake with a capacity of 3000 liters/second which is targeted to be trialled in December 2022. In addition, the PUPR Ministry is also building the Sepaku Semoi Dam and a Water Treatment Plant (IPA) with the potential to meet raw water needs of 5,000 liters/second, as well as conducting a feasibility study on the Selamatyu Dam in 2021 which has the potential to provide raw water up to 3,950 liters/second. The concept of a sponge city that is carried out can also increase the amount of water by holding rainwater so that it does not run over directly into drainage canals and which can increase infiltration into the ground by designing facilities, infrastructure, and building requirements with catchment areas. The government has launched various policies to later manage the water cycle, including waste water management. It's just that, it doesn't mention how the government plans to remediate water sources which are currently polluted. According to Marganingrum & Noviarda (2010), water pollution due to coal mining, which is rife in IKN, includes acidification of water due to eroding soil and polluting waters with sulfide content. In addition, mining washing waste can also cause heavy metal contamination in waters (DLH Banten Province, 2017). The existence of a wastewater remediation plan is an important component for the sustainability of water availability beyond maintaining the water cycle in the IKN area. If wastewater is not treated, the volume of wastewater resulting from community and government activities at the IKN will continue to increase and have the potential to pollute water bodies when the wastewater management system cannot accommodate it within its limited capacity. Without a remediation plan and method, the problem of water crisis is only temporarily diverted by the supply of clean water from a new dam, then reappears due to unsustainable handling. Thus, it is necessary to study the appropriate remediation methods for groundwater or others that are in accordance with the water quality conditions in the IKN area.

The third problem is the management of mine pits and former mine pits. It is known that there are more than 1900 mining pits in the IKN concession area. This hole will be restored in the IKN master plan with reclamation, in collaboration with the private sector and the community. According to the Regulation of the Minister of the Environment Number 18 of 2008, reclamation is an activity aimed at repairing or managing the use of disturbed land as a result of mining operations so that it can function and be efficient according to its designation. Reclamation that is commonly done is by filling up the former mining pits. Then, revegetation is carried out by replanting various plants (Adi et al., 2017) so that within a certain period of time the reclaimed area will be green again. However, the mine reclamation process cannot fully return the land to its former condition because the condition of ex-mining soil will be different from fertile soil. According to Suprpto (2008), the area of land that has been used as a mining site will have some differences compared to fertile land. The differences in question include: (1) chemical differences. Mine ex-mining land can be polluted due to mineral pollution, can cause a decrease in soil pH, low nutrient content, and is harmful to plants; (2) differences in physics. The structure of ex-mining soil will be different, one of the reasons is due to the intervention of mineral pollution as in point (1). With these differences, returning the quality

of ex-mining soil to its original quality will be difficult to do. In addition, the results of reclamation efforts cannot be felt instantly, but take years.

With the contamination of ex-mining land, 29,000 hectares of land (Bappenas et al., 2020) or around 11.33% of the archipelago's IKN area that has been used for mining activities cannot be used for agricultural activities and food production for a certain duration. The long reclamation process, especially in the growth of revegetated plants and their maintenance (Adi et al., 2017) makes reclamation land temporarily unusable for food production. This can lead to reduced food sources due to reduced productive land that can be used. The fifth vision of IKN Nusantara, which is related to circularity and resilience, states that one of the government's targets in 2045 is to achieve the use of >10% of an area of 256,000 hectares for food production purposes. This vision can be realized, considering that 11.33% of ex-mining areas should have undergone reclamation in 2045 and even though the reclamation is not complete, there is still 88.7% of land that is not polluted by mining activities and some of it has the potential to be utilized in food production. .

The final problem is the use of new and renewable energy (EBT), which is still very low, even though IKN proclaims that 100% of its energy will come from renewable energy. In fact, there are still coal-fired steam power plants (PLTU) that are operating and will operate around the IKN area (Johansyah et al., 2019). This shows the government's biased commitment, which on the one hand wants to use 100% EBT as its energy source, but on the other hand it still uses non-renewable energy, such as coal-fired power plants as its energy source. With this bias, it will be difficult to fulfill 100% of the IKN's energy needs using EBT. Clear and firm action is needed from the government to replace all IKN energy sources with 100% EBT. In addition, a large budget is also required for the installation of various EBT storage devices.

On the other hand, the potential for EBT in Kalimantan itself is also quite large so that 100% energy fulfillment with EBT can be carried out. In East Kalimantan, the EBT potential in 2019 reached 23,841 MW (Tampubolon et al., 2019). One of the NRE with the greatest potential is solar power, which is 13,479 MW which can be utilized through the use of solar power plants (PLTS) (Tampubolon et al., 2019). Another NRE that has the potential to be used is biomass, such as crude palm oil. Based on data from the Central Statistics Agency (2021), East Kalimantan will become one of the provinces with the largest palm oil production in Indonesia in 2021 with a total production of 3,800,000 tonnes of palm oil. This allows crude palm oil to become one of the EBT supporting energy availability in IKN. In addition, another NRE with great potential is water, with a potential of 5,615 MW (Tampubolon et al., 2019). Using water, such as through a hydroelectric power plant (PLTA) can also support the realization of 100% EBT. Supported by the construction and/or utilization of existing dams/dams, the kinetic energy created from the flow of water can be converted into electricity with hydropower so that it can support the availability of energy in IKN. Considering that the potential for EBT around the IKN area, especially East Kalimantan is quite large, the achievement of an IKN that utilizes 100% EBT can be realized, as long as the government has a clear and firm commitment to switching energy sources and must also be supported by an adequate budget to build various supporting facilities. EBT.

CONCLUSION

Based on the studies that have been conducted, the selection of IKN areas in East Kalimantan is quite in line with the criteria required for a capital city, namely location, natural resources, existential infrastructure, and ideal population status for further development. In dealing with several environmental problems that already exist in the IKN area, the government has prepared countermeasures such as rehabilitation/reforestation of ex-deforestation land,

reclamation of mining and ex-mining land, Sepaku Semoi Dam, Water Treatment Plant (IPA), and water management policies to address pollution. groundwater. These efforts have been planned according to the concepts of Forest City and Sponge City, but in their implementation there are several deficiencies, such as the government's method of remediation for polluted water is not explained and the follow-up actions for coal-fired power plants which are still and will be operating around the IKN area are not explained. Therefore, in the future, improvements in implementation and firmness from the government are needed in making policies so that the IKN that is built can be in accordance with the concepts of Forest City and Sponge City.

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