

# Implementation of Sustainable City Concept in New Capital City Development Planning

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**Abstract.** New capital City development will be carried out in the Eastern Kalimantan region with the concept of a sustainable city. The research aims to find out whether the planning process carried out in new capital city development is in line with the concept of the sustainable city according to the Research Triangle Institute (1996) with indicators of ecology, economy, Society equity, engagement, and energy. The research uses qualitative methods through a descriptive approach using secondary data that comes from online news sites and previous research. Based on the results of this research, implementation of the concept of a sustainable city in New capital city development planning shows that (a) engagement aspects have shown the involvement of stakeholders of the community and investors; (b) environmental aspects have applied efforts of conservation of biodiversity and waste management in planning this development; (c) in energy aspects has taken into account the planning of intelligent building concepts and environmentally friendly transportation; (d) the society aspects is marked by the availability of facilities and services Education as well as Health; (e) in economic aspects take into consideration the development of the agriculture and plantation industry and development of ecosystems.

## 1 Introduction

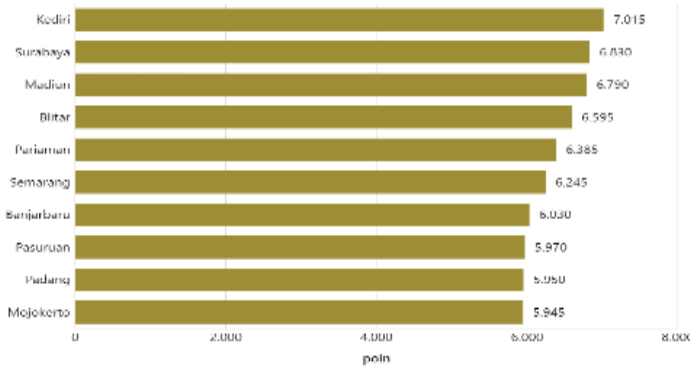
The relocation of Indonesia's capital city from the island of Java, specifically Jakarta, to the island of Kalimantan, namely East Kalimantan Province, has been in the public spotlight. The government has long planned to move the capital city, and finally, this plan began to be realized in 2022. The government's seriousness in pursuing the construction of the New Capital City is marked by the inclusion of this development plan in the 2020-2024 National Medium-Term Development Plan (RPJMN) and the passing of Law Number 3 of 2022 concerning the National Capital City. The background of this capital city development is also due to the development gap that occurs between the island of Java and regions outside Java in the economic, social, infrastructure, education, and health sectors. The development of a new capital city is an effort to implement the ideals of the Indonesian nation to create prosperity for all people. The development of a new capital city is an effort to implement the ideals of the Indonesian nation to create the welfare of the entire community. The welfare that has been dominated in the Java region, with the new capital

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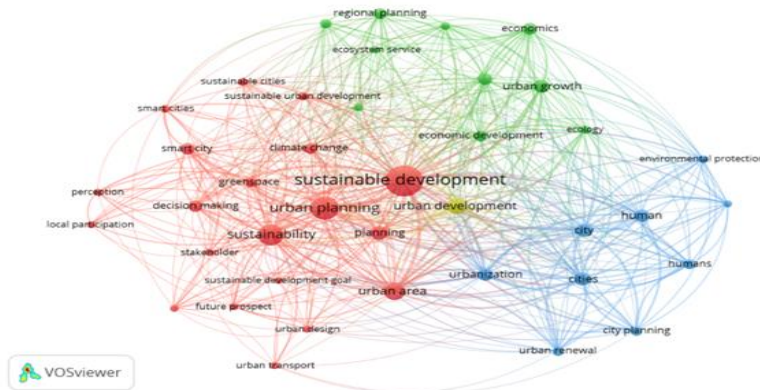
city, all people, especially in Eastern Indonesia, can feel the real welfare. The construction of the new capital city is an effort made by the government to carry out inclusive development by spreading the magnet of economic growth throughout Indonesia (1).

The development of a new capital city is expected to become a “World City for All” with four main roles, namely as a driver of Indonesia's future economy, a symbol of national identity, smart infrastructure and connectivity, and a sustainable city in the world. A sustainable city in the world will be realized by the new capital city by carrying out the concept of a sustainable city. Indonesia has implemented many sustainable city concepts but the success in implementing sustainable cities is mostly in the Java region.



**Fig. 1.** Data of the 10 most sustainable cities in Indonesia according to UI Green City Metric in 2023.

Based on the data above, the most sustainable cities in Indonesia are dominated by cities in the Java Island region. As we know, the development of the new capital city will be carried out in the East Kalimantan region, which is not included in the best sustainable city rankings. In this case, the application of the sustainable city concept in planning the development of the new national capital in the East Kalimantan region is a challenge in the development process, can the sustainable city concept be implemented properly in planning the development of the new capital city? Therefore, to answer this question, indicators are needed to measure the success of sustainable city development through careful planning. The concept of sustainable city development will optimize development that is beneficial in the long term by taking into account environmental, economic, actor involvement, energy utilization, and social equality aspects.



**Fig 2.** Topic development Map of Sustainable City Concept in Development Planning indexed by Scopus in 2019-2024 data processed by the author with VOSviewers.

Based on the figure above, it is known that research on sustainable city development planning emphasizes the concept of sustainable development and urban planning. Research related to the concept of sustainable cities in development planning, especially in the aspects of economics, environmental protection, and local participation is still rare. Even aspects of waste management, equality of education and health facilities, involvement of private actors, industry, and ecotourism in the concept of sustainable urban development planning, have not yet been researched. This shows that there is further potential in understanding the concept of sustainable cities in development planning which will emphasize aspects of ecology (planning for biodiversity conservation and waste management), economy (planning for structuring the industrial sector and the tourism sector), society equity (equal access planning to education and health services), engagement (involvement of Indigenous peoples and investors), and energy (smart buildings and the use of environmentally friendly transportation).

This article will discuss the “Implementation of the Sustainable City Concept in New Capital City Development Planning” as it is known that Indonesia has begun to apply the concept of sustainable city in cities in Indonesia. Indicators of a Sustainable City according to the Research Triangle Institute (1996) consist of Environment, Economy, Equity, Engagement, and Energy. The purpose of this paper is to find out whether the planning process carried out in the development of a new capital city is by the existing sustainable city concept.

## **2 Literature Review**

Sustainable urban development is aligned with policy goals related to the Sustainable Development Goals (SDGs) while contributing to global sustainability targets (2). Creating a sustainable city requires five basic principles commonly known as Panca E which consists of Environment, Economy, Equity, Engagement, and Energy (Research Triangle Institute (1996) in Budiharjo & Soedjarto, 2005 in (3).

Conservation of natural resources is an effort to preserve and maintain natural resources to remain sustainable (4). In addition, as an effort to create sustainable city development, waste management is also an ecological criterion that must be managed properly so that pollution and damage to the natural environment can be avoided (3).

Economics is an important aspect in the world either individually or in groups to improve living standards based on the need and desire to survive (5). The industrial sector plays an important role in changing the structure of the country's economy because it can absorb a large workforce and build added value from each input (6). The industrial sector should also emphasize the use of renewable and environmentally friendly energy sources (7). The tourism sector also has the potential to improve economic standards for its citizens (8). The concept of ecotourism is a sustainable tourism development that aims to support the preservation of the natural and cultural environment and increase community participation in its management so that it is economically beneficial for the surrounding community (9).

Sustainable urban development will refer to the fourth SDG concept of inclusive, equitable, and high-quality education (10). Education is an aspect that supports sustainability, especially for human civilization in future generations. This sustainable urban domain also includes aspects of Health services to improve the quality of life (11). Equitable distribution of health services is key so that all people have the same rights to quality health services to create a stable social atmosphere by encouraging productivity, economic growth, and community welfare (12).

From a development point of view, community participation acts as a source of information related to problems that occur through the aspirations they convey so that it can

create good synergy in optimizing development (13). Actors in development planning also allow the involvement of foreign actors or investors who are influential in shaping the environment of the sustainable city to be built (14). According to Hochstein, 2020 in (15) states that investors will have a very important role in raising capital for development planning which can affect the country's economic growth.

Energy is the most influential component for urban areas in social, economic, transportation, infrastructure, and environmental aspects so sustainable city development planning for energy use is designed to be used sustainably (16). Building design prioritizes energy efficiency to reduce the impact of global warming (17). One of the efforts of sustainable urban planning is the use of more environmentally friendly fuel transportation and the provision of large-capacity and environmentally friendly public transportation modes is also an efficient step in sustainable development that minimizes the use of private vehicles that trigger congestion and air pollution (18).

### 3 Research Methods

This research uses a qualitative method with a descriptive approach that describes the findings related to the implementation of the sustainable city concept in planning the development of a new capital city. The presentation in this study shows the implementation of 5 indicators of the concept of sustainable cities based on the theory of the Triangle Institute (1996) in planning the development of a new capital city. According to Ronny, 1990 (19), secondary data in research can use private data and public data. In this study, the authors utilized public secondary data obtained from online news sites and previous studies. The use of this analysis technique method tries to answer the research formulation, namely: Can the concept of the sustainable city be implemented well in the planning of new capital city development in the East Kalimantan region?



**Fig. 4.** Stages of research. Processed by the author.

The first stage of the research begins with data collection, which is carried out by collecting secondary data derived from online news data for 2022-2024 obtained by Ncapture using NVivo 14 to obtain web content consisting of news about new capital city Development Planning. The second stage of this research is carried out by Data Reduction to sort and select data that is to the objectives of the research study. The sources of reports come from accurate and reliable online news sites such as Antaranews, CNN Indonesia, Detik, Kompas, and Liputan6 as evidenced by the verification status by the Press Council. The following are the results of data collection through online media:

No.	Online Media	Verification Status	Intensity	Year Range
1.	<a href="https://www.antaraneews.com/">https://www.antaraneews.com/</a>	September 4, 2018, by Press Council	19	2022-2024
2.	<a href="https://www.cnnindonesia.com/">https://www.cnnindonesia.com/</a>	November 22, 2021, by Press Council	19	2022-2024
3.	<a href="https://www.detik.com/">https://www.detik.com/</a>	September 4, 2018, by Press Council	19	2022-2024
4.	<a href="https://www.kompas.com/">https://www.kompas.com/</a>	June 17, 2019, by Press Council	19	2022-2024
5.	<a href="https://www.liputan6.com/">https://www.liputan6.com/</a>	September 4, 2018, by Press Council	19	2022-2024

**Fig. 3.** Data collection through online news media. Data obtained by the author.

The third stage is data analysis to answer the existing problem formulation. The data was then analyzed using Nvivo 14 software and grouped into five main indicators from the theory used. Each of these aspects contains two main parameters that are adjusted to the relevance of the main topic of discussion. Then, the final stage is drawing conclusions that generalize the results of existing research.

### 4 Result and Discussion

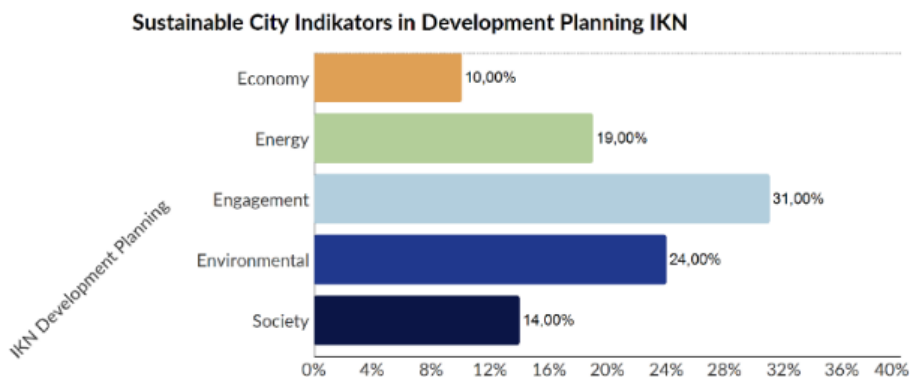
In planning the development of a new capital city, the Government of Indonesia adopts the concept of sustainable city development which is an applied concept of sustainable development. The concept of sustainable city planning will focus on development that can be beneficial in the long term. Sustainable city development planning will pay attention to several aspects such as environmental, economic, stakeholder involvement, energy utilization, and social equality. The planning of the new capital city development concept was then widely reported in various media in Indonesia because it became a new concept in the implementation of urban development.



**Fig. 5.** Most discussed topics in online news coverage. Data was processed by the author using Nvivo 14.

Figure 5 is a word cloud image resulting from data processing in Nvivo 14. This word cloud explains the number of word frequencies that appear in online media news. This figure shows the most popular words that appear in online news with a word limit of 100 words. The figure above shows that the word "IKN" (New Capital City) is the most

frequently mentioned in online news related to the planning of the construction of the Indonesian National Capital. In addition, there are several other related keywords such as "Kota", "Pembangunan", and "Nusantara". Important aspects of development planning that are in line with the topic of this research are also a form of popular words presented in the Word Cloud.



**Fig. 6.** Graph of Sustainable city indicators in new capital city development planning. Data processed by the author using Nvivo 14

In Figure 6, we can see the findings related to the indicators of the concept of sustainable cities in the development planning of the new capital city in Indonesia. This sustainable city development planning contains five main aspects, namely Environment, Economy, Equity, Engagement, and Energy. The stakeholder engagement aspect holds the highest value at 31% and the economic aspect holds the lowest value at 10%.

#### 4.1 Stakeholders Engagement in New Capital City Development Planning

Engagement is a form of stakeholder involvement in development planning. Stakeholders involved in this planning consist of local communities and the private sector. From a development point of view, community participation acts as a source of information related to problems that occur through the aspirations they convey so that it can create good synergy in optimizing development (13). Local communities will experience many changes in their lives due to this development in terms of cultural, social, and natural resources. As a democratic country based on law, regulations are needed so that this development can be carried out properly. Law number 21 of 2023 is a form of regulation that states that the community can be involved in the planning, development, transfer, and management processes in the form of public consultation, deliberation, partnership, and delivery of aspirations. Therefore, to encourage the sustainable development of the new capital city, the government as the initiator of development needs to provide space for community participation both formally through discussions and informally through social media that can be accommodated by policymakers so that pseudo-participation mechanisms can be avoided.

According to Hochstein, 2020 (15), Investors play an important role, especially in raising capital for development planning and affecting the country's economic growth. In planning the development of a new capital city, the private sector tends to be involved in the investment or capital sector. Based on the source of the National Medium-Term Development Plan (RPJMN) for 2022-2024, the development of a new capital city will require funding of 466.04 Trillion, which relies on funds from Government and Business

Entity Cooperation (PPP) of 252.46 Trillion. In addition, the private sector is also involved in optimizing the planning of the sustainable city concept which affects shaping the city environment (14). The realization is the involvement of foreign countries such as Kazakhstan, Australia, Singapore, China, and Finland as collaboration partners to exchange knowledge in building a new capital city as a green, inclusive, smart, and sustainable city.

## **4.2 Environmental Aspects in Planning the Development of the New Capital City**

Environmental is a development indicator that prioritizes the sustainability of the natural environment. Conservation of natural resources is an effort to preserve and maintain natural resources to remain sustainable (4). The new capital city is built in the East Kalimantan Province which is known to have vast forests with a diversity of flora and fauna. Within a radius of 5 to 20 kilometers from the new capital city, there are important areas for nature conservation such as the Sungai Wei Protection Forest, Manggar River, Meratus, and Balikpapan Bay which are used as areas to preserve and reintroduce orangutans (20). In realizing the development of the new capital city as a sustainable city, planning guidelines are needed which are contained in the Nusantara Nature Positive Plan. This guideline explains that the development of a new capital city is based on the concept of a forest city to conserve national and global biodiversity through efforts to maintain existing forest and wetland ecosystems; rehabilitate, restore, and reclaim damaged ecosystems; optimize performance in the preservation and utilization of biodiversity with the development of science, technology, and information; increase the capacity and awareness of local communities and indigenous peoples in biodiversity management; and supervise and enforce biodiversity management laws and regulations.

In addition, as an effort to create sustainable city development, waste management is also an ecological criterion that must receive great attention so that urban environmental pollution and natural damage can be avoided (3). waste management needs to be considered in planning the development of the new capital city because waste is a major problem that is difficult to solve in big cities in Indonesia. Waste management planning in a new capital city is in the Nusantara Smart City Innovative Solution guidelines which contain that waste management will use a smart waste management domain using smart bins, smart waste fleets, and 3R (Reduce, Reuse, Recycle) Material Recovery Facility (MRF) based on IoT technology. In addition to smart waste management, integrated waste management based on modernization towards zero waste and waste to energy is also carried out (21). With this plan, the government aims to recycle 60% of solid waste by 2045.

## **4.3 Energy Aspect in Planning the Development of the New Capital City**

Energy sustainability in the development of a new capital city is applied through the concept of smart building planning and environmentally friendly transportation. This smart building is focused on building development by minimizing pollution that is destructive to the natural environment by prioritizing energy efficiency and reducing the impact of global warming (17). Based on the new capital city Development planning guidebook, this development is energy efficient by reducing energy consumption and carbon emission footprint; integrating renewable energy sources such as sunlight, water, wind, and geothermal; conserving water with a water use reduction and saving system; and reducing recycled waste. Other efforts of sustainable urban planning include the use of more environmentally friendly transportation fuels and the provision of large-capacity and environmentally friendly public transportation modes (18). In this plan, the use of public transportation will be more massive as a means of mobilizing residents so that the use of

private vehicles with large numbers that trigger congestion and pollution can be minimized. Almost all transportation mode vehicles are planned to use Electric fuel and the development of low-emission renewable energy as an effort to achieve the Net Zero Emission target in the new capital city.

#### **4.4 Society Aspect in Planning the Development of the New Capital City**

Sustainable urban design must be inclusive, and socially just, and ensure that all people have access to the resources and services needed to lead a quality life (21). Sustainable city development refers to the SDG's concept of quality education and health. Education plays an important role in producing quality human resources for Indonesia's golden generation. Therefore, in this development planning, the principle of education in the new capital city carries the concept of 21st-century education which builds the best education ecosystem to meet the needs of future talents in the economic cluster, an example for higher education providers and improve the quality of life (22). Referring to the new capital city guidebook, this education development planning will be carried out by building infrastructure that supports educational facilities through national and international schools and research centers with the application of smart education systems such as smart libraries, digital classrooms, and E-Learning, student admission, and integrated education platforms.

The health sector is a crucial aspect of sustainable development planning because it has a major impact on improving the quality of life of the community. Equitable distribution of health services can create a social atmosphere that encourages productivity, economic growth, and community welfare (12). The use of clean energy is a priority to maintain public health through a clean and healthy environment for a sustainable future for the new capital city. In addition, various health facilities will also be built, such as international standard hospitals and BPJS offices that can be accessed by all elements of society. The availability of these high-quality Health facilities is supported by advanced technology and international quality Health services. Various health facilities are planned in the new capital city to reduce disparities in health services so that all Indonesians can experience quality health facilities that are easily accessible.

#### **4.5 Economy Aspects in Planning the Development of the New Capital City**

The economy is an important aspect of the world both individually and in groups in improving living standards (5). In planning the development of a new capital city that carries the concept of a sustainable city, economic development will be carried out through the industrial and tourism sectors. The industrial sector plays an important role in changing the structure of the country's economy because it can absorb a large workforce and build added value from each input (6). To achieve the successful implementation of the sustainable city concept, in the guidebook made by the Nusantara Capital Authority in 2023, the industrial sector will be developed which focuses on the sustainable agriculture industry cluster as a value-added vegetable innovation developed to improve the economy of the local community. Based on sources from the website [ikn.go.id](http://ikn.go.id), efforts to prepare the agricultural industry cluster are carried out through socialization and training conducted by the government to local communities such as hydroponic training and mushroom cultivation which has the potential to increase food diversification.

The tourism sector has a high potential to improve the living standards of its citizens, especially in sustainable economic standards (8). Sustainable city development planning in the tourism sector is developed through the concept of ecotourism to support efforts to preserve the natural and cultural environment through optimizing community participation in its management so that it can be economically beneficial for the surrounding community



(9). New capital city Ecotourism will be centered on utilizing the natural environment and traditional culture supported by city tourism through Meetings, Incentives, Conferencing, Exhibitions (MICE), as well as Health and wellness tourism (22). Ecotourism development to improve the economy in a new capital city is developed with a commitment to preserve the natural environment in the East Kalimantan region.

## 5 Conclusion

Based on the author's analysis of planning a new capital city using the concept of sustainable city Research Triangle Institute (1996) with secondary data derived from online news media and journal references, overall planning has adopted the concept of sustainable city development. This is evidenced by: (a) The engagement aspect has shown the involvement of community stakeholders and investors; (b) In the environmental aspect, efforts to conserve biodiversity and waste management have been applied in planning this development; (c) In the energy aspect, it has paid attention to the planning of the concept of smart buildings and environmentally friendly transportation; (d) The society aspect is characterized by equitable distribution of education and health facilities and services; (e) In the economy aspect, it pays attention to the development of the agricultural and plantation industry sectors and the development of ecotourism. Therefore, it is hoped that subsequent studies can further examine the relevance between the concept of new capital city development planning which carries the concept of a sustainable city with the reality of new capital city development that is being implemented.

## Acknowledge

The author is grateful to Helen Dian Fridayani, S.IP., M.IP., Ph.D., and Prof. Dr. Achmad Nurmandi, M.Sc. for their guidance, support, constructive criticism, and suggestions during this research process.

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