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Nagara Rimba Nusa: Creating a Co-Existence Living Between Indonesia's New Capital City and the Forest Ecosystem in Borneo Island, Indonesia

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ABSTRACT

The capital of Indonesia is planned to be relocated to East Kalimantan, Borneo Island starting 2024. Borneo Island is treasured for its vast biodiversity and enormous rainforest ecosystem. Entitled "*Nagara Rimba Nusa*," the design of the core area of the new capital city *Ibu Kota Nusantara*, brought the idea of building a city with the wisdom of Indonesian Culture and Forests. Taking forest ecosystem as the foundation and core, the design approach reflects urban forming process, responsive design, and nature-inspired architecture. This article strives to unfold the design principles and inventions dealing with the complex interlaced relations between the city and the forest, which reflect the ideas and literature of landscape urbanism. Landscape urbanism is portrayed as a development agent and a way of thinking in the design strategies for *Kawasan Inti Pusat Pemerintahan* (KIPP), to embed the urban form into Borneo's forest ecosystem. Through this perspective and innovative design approaches, *Nagara Rimba Nusa* creates an ideal city that fits in the context of forest environment.

HIGHLIGHTS

- Integrates Indonesia's local wisdom of nature and landscape urbanism in creating a sustainable urban environment for the new capital city
- Proposes a new urban morphology allowing the interplay of built environments within the forest landscape and act as one organism
- Proposes a multi-layered compact city with the 10-minute city model and green mobility oriented transportation system

KEYWORDS

Landscape Urbanism;
Forest Urbanism;
Local Wisdom;
Ibu Kota Nusantara;
Nagara Rimba Nusa;
Capital City

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1 Relocating Indonesia's New Capital City to East Borneo

The decision to relocate Indonesia's capital city (*Ibu Kota Nusantara*, IKN) to East Kalimantan, part of Borneo Island, was made in 2019 by the Republic of Indonesia's 7th President, Joko Widodo. The relocation plan is aiming to realize equity and economic justice, as well as releasing the overburden of the current capital city Jakarta caused by high rapid urbanization and sinking[1]. Climate change becomes an issue causing flood disasters in Jakarta every year. Set to be inaugurated in 2024, IKN is expected to accommodate about 500,000 residents by 2024 and about 2 million by 2039[1]. The ambitious plan of the new capital is contested as it loads with social and environmental responsibilities in bringing the urban scene to the forest environment of Borneo.

Borneo, situated in the equatorial zone, is well-known for its enormous rainforest ecosystem and rich biodiversity, with a sensitive environment. It has the finest and most extensive remaining dipterocarp forest in the region, home to more than one thousand endemic tree species[2]. However, over the past four decades, Borneo's original forest structure has been changed as old-growth forest was substituted by industrial plantations[3]. As shown in research, the biodiversity of tropical forests in Borneo is considerably under pressure due to the extreme use of forests and forest products beyond the carrying capacity[2], which may be aggravated by the new capital city project. However, President Widodo came up with an opposite perspective to relocate the Indonesian capital within this environment.

The capital relocation to East Kalimantan is seen from a different perspective by the government as a solution to distribute economy and population outside Java Island. It is believed to represent a symbolic shift of decentralized Indonesia[4] as Borneo is located at the heart of Indonesia. The new capital city is planned to be a pilot project that would integrate Indonesia's local wisdom of nature and urbanism in creating a sustainable urban environment with future-ready city innovations. IKN is envisioned as the nation's driver to lead the big leap of transformation and as a new symbol of the nation's identity and advancement.

The design competition of the new capital's core government area (*Kawasan Inti Pusat Pemerintahan*, KIPP) was won by "*Nagara Rimba Nusa*" (state, forest, islands) in 2019. *Nagara Rimba Nusa* represents a city built with the wisdom of Indonesian Culture and Forests, blended with the smart city design objectives. Setting the forest ecosystem as the foundation and core, the design approach reflects urban forming process, responsive design gestures, and nature-inspired architecture through biophilic and biomimicry ways. Transformation becomes the highlighted concept of *Nagara Rimba Nusa*, offering a new experience of work, living, mobility, and culture, while integrating urban planning and nature conservation.

From the designers' point of view, this article focuses on the concept of *Nagara Rimba Nusa* and introduces the distinct design strategies, and explains the design teams' ideas in responding to KIPP's specific site conditions and the targeted city's key performance indicators (KPIs).

2 Interlacing an Urban Development Within the Borneo Forest Ecosystem

With a total area of 6,671 hm^2, the KIPP area is situated in the Borneo lowland rainforest ecoregion, covering both wet swamp forests (mangrove, freshwater swamp, and peat swamp forest) and dry lowland forests. Its great richness of flora in lowland rainforests comprises a complex vegetation structure where tall trees perform as a framework and smaller trees live within. According to Kathy MacKinnon et al. in *The Ecology of Kalimantan*, about 10% of all trees and 80% of the emergent are Dipterocarpaceae in this formation[5], while mangrove forest habitats are found in most Borneo coastline area. Aside from its encouraging position, the land in KIPP is currently excessively used for non-indigenous plantation forestry such as palm oil (*Elaeis guineensis*), eucalyptus (*Eucalyptus pellita*), and acacia (*Acacia mangium*). KIPP has a dynamic topography with a tremendous mixture of rolling hills and valleys, standing on strongly leached, acid forest soils with relatively low fertility and a zone of clay accumulation that shrink and swell with changes in moisture.

2.1 Forest Urbanism Concept in KIPP

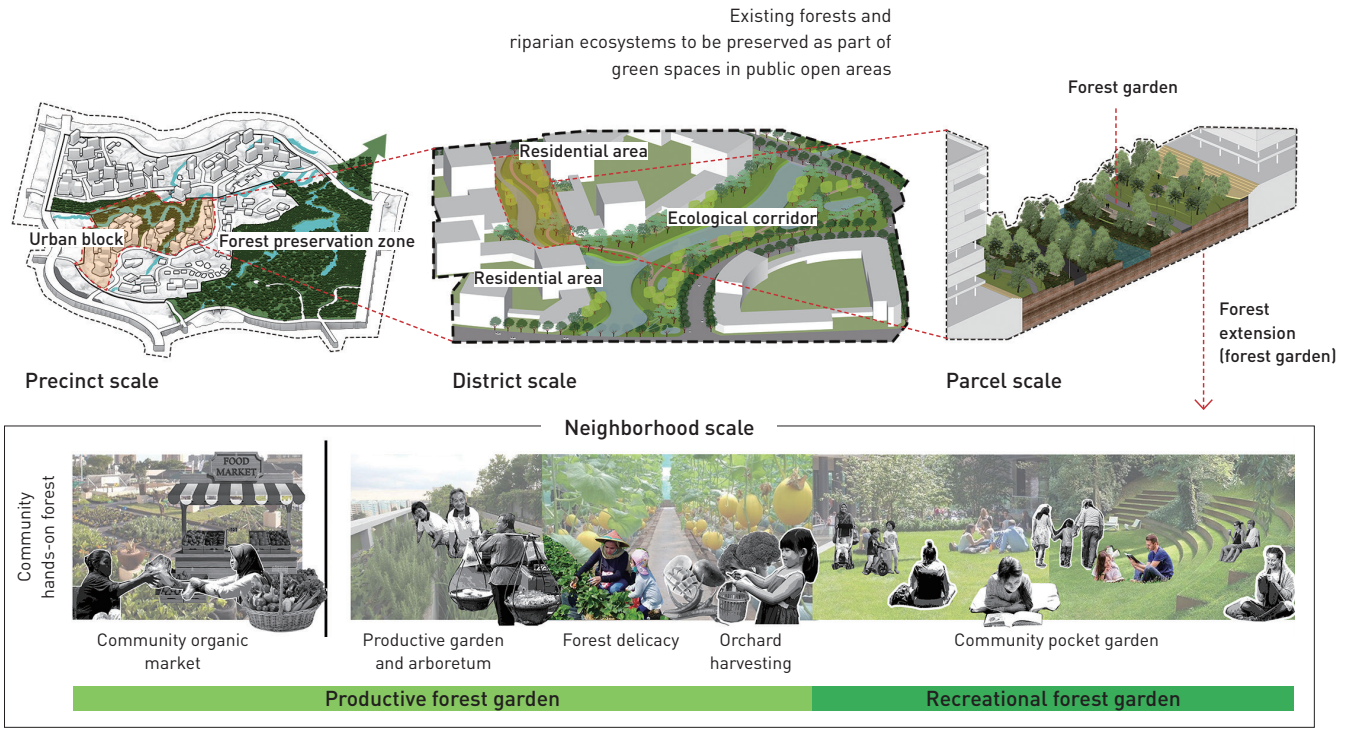
The notion of forest urbanism applied in the urban design development of KIPP reveals that the forest's physical presence is essential for structural relations between forest and urban fabric, which is valuable in establishing a high-quality living within the proximity of Borneo's tropical rainforest ecosystem (Fig. 1). Forest, as part of the natural landscape system, is capable of being a control agent to rejuvenate architecture and urbanism together. Meanwhile, landscape urbanism offers a new mode to displace conventional ethics of architecture and urbanism[6], formalizes different types of existence, brings transformations and dynamics, as well as intermixes urban layers and patches into an exciting living system[7].

In the context of KIPP, forest urbanism can inhabit the forest infrastructure as a backbone which could impede peri-urban

expansion. It does not necessarily need large-scale operations and can be realized through small interventions. The scale of this project (from community to region) and consistency of design are driven by the forest ecosystem structure. The park system and other natural areas provide habitats for different wildlife and enhance biodiversity. The ecosystem formed by each park conserves and protects the natural forest structure that provides a much-needed safe place for flora and fauna. Therefore, the construction of parks could contribute to the gradual reforestation of lowland tropical rainforest, preserving the existing forest ecosystem and enhancing the biodiversity within the urban area.

Inspired by Indigenous wisdom from Dayak communities and believing that forests are part of people's "livelihoods," *Nagara Rimba Nusa* transmits the idea of how humans relate to nature. This local wisdom has promoted forest preservation and the socio-cultural community development for centuries. The urban settlement around the forest can be arranged well compliantly to the "forest ecosystem culture." The wisdom of forest ecosystem culture, i.e., the traditional community knowledge and culture (e.g., local customary law) in preserving and monitoring the forest (sacred and community forest), has contributed to forest vegetation diversity. Many swidden farmers are rational and sophisticated users of their natural environment[8]. Sustainability of the forest ecosystem depends on farmers' cultivation for subsistence rather than cash, and on cultural and customary law restraints[9]. Most local communities engage in traditional subsistence agriculture (swidden agriculture), which is a form of extensive land use. They clear primary and secondary forests to yield both ecological and cultural benefits[10]. Just as restoring the rainforest is a dynamic process involving an intricate and connected ecosystem, the development of the new capital engages living design elements that can breathe, nurture, and grow. Prioritizing forest ecosystem culture is crucial because it allows the communities to adapt to the future and learn from the past, be self-sufficient at every level and resilient to changing needs, as well as create a healthy and sustainable community. The sustainability and educational programs implemented in the new capital city will demonstrate the role of urban planning in the global arena to implement exemplary best practices. The forest environment and its localism (culture) can also be done by adopting local community wisdom, especially in the utilization of forest resources, which will foster a sense of belonging among Indonesian citizens and will be cherished now and for many generations to come.

Borneo's rainforest and natural wetlands contribute to numerous environmental benefits, such as protecting watersheds and the integrity of water supplies, preventing soil erosion, and conserving soil fertility. Thus, KIPP is designed with due regard to the natural process, forest structure, and context of tropical rainforest ecosystems. *Nagara Rimba Nusa* proposes a new urban morphology allowing for the interplay of KIPP's built environments within



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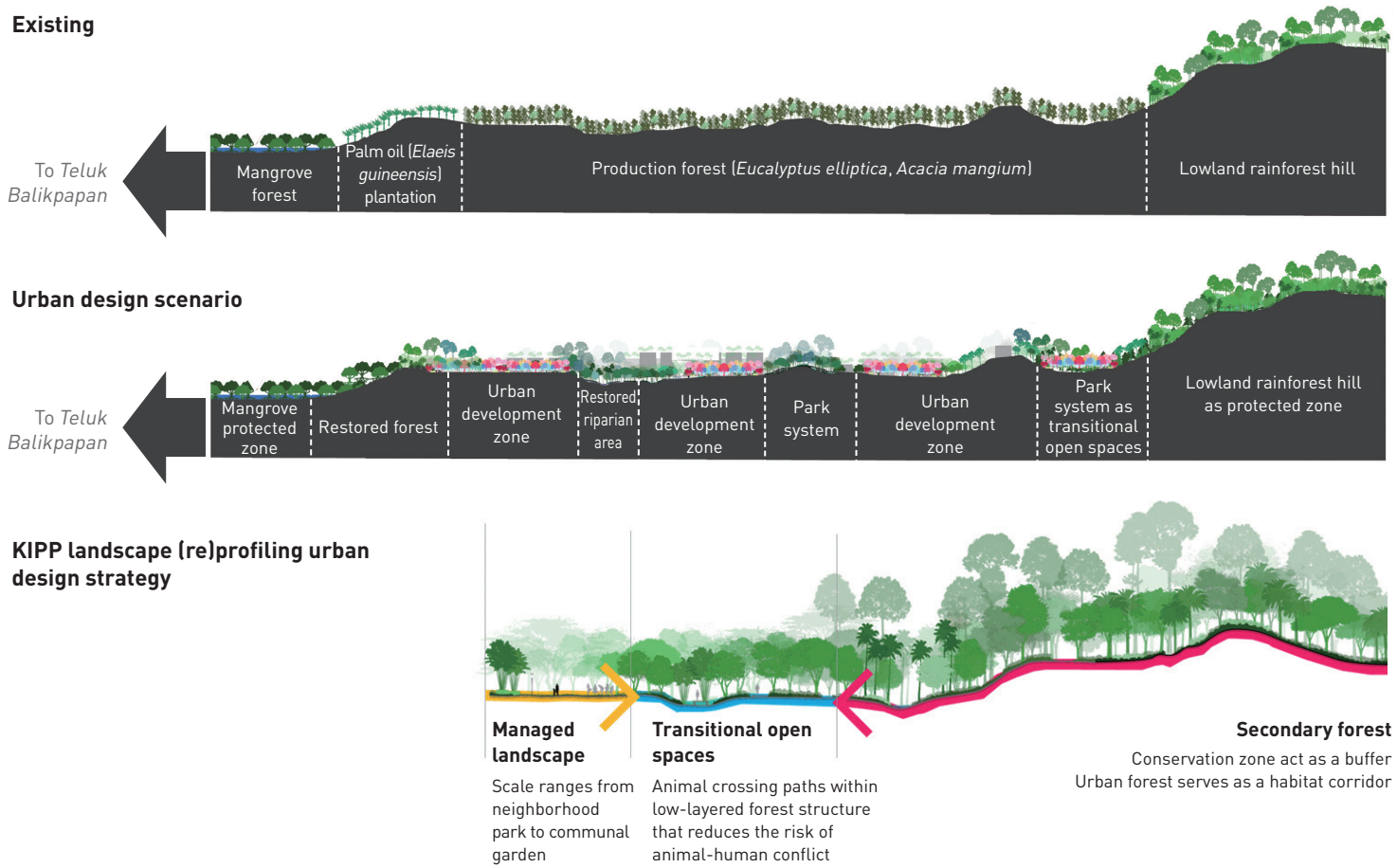
1. A cross-scale urban ecosystem where nature and city are intertwined as one organism in KIPP's forest ecosystem.

2. KIPP's landscape (re)profiling urban design strategies and design principles for sustainable forest and community.

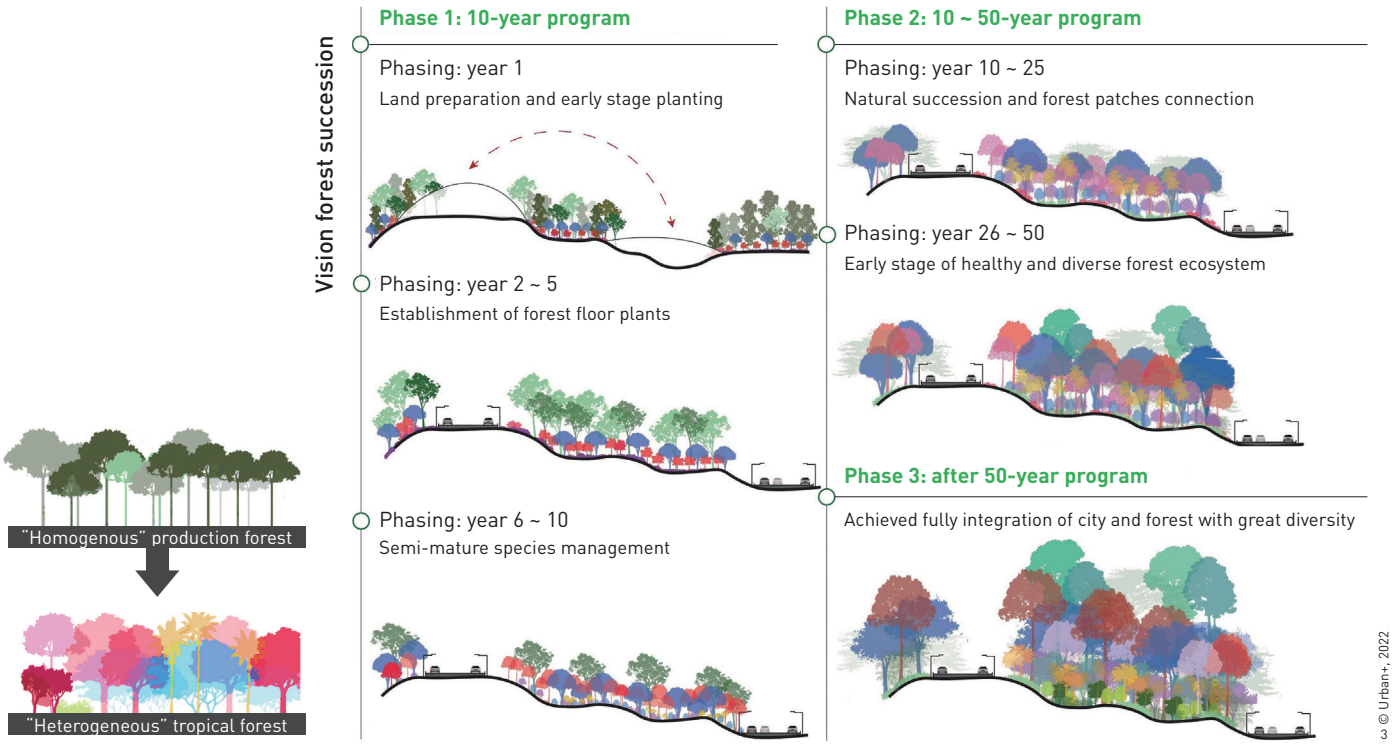


the forest landscape as one organism, based on the understanding that the complex relationship between the city and the natural environment is crucial to landscape sustainability. Pursuing a new typology for future communities (Fig. 1), KIPP is designed with a diverse mix of urban blocks and forest environments, from a precinct scale to a parcel scale, to construct community in the forest city. This approach not only offers a sustainable nature but also builds community spirit by engaging the residents within the community's hands-on forest.

2.2 (Re)Profiling a Sequential "*Rimba Kota*" Ecosystem

KIPP is designed to be a notable mixed-use urban development zone comprising central government complex residential area and business district nestled within a forest setting. The landscape design approach creates a series of well-planned green spaces that link the city's green and blue network, including residential areas, activity centers, mass transit systems, community facilities, and pedestrian and bicycle ways to create an important green framework to interlink people with the forest environment. In addition, it features varied environmental programs at different scales, which can support programmatic, ecological, and social functions. The design approach also emphasizes the diversity and proportion of green spaces in the city, which is being incorporated as part of the urban forest (*Rimba Kota*). The hierarchical open spaces are connected to nature (forest ecosystem) and cultivate a greater sense of community that leads to sustainability. The scale of the public open spaces in KIPP creates a balance between built structures and green spaces. KIPP's sustainable forest and community design principles show the relationship among 1) the conservation zone as a buffer within peri-urban and an eco-corridor, 2) the intermediate transitional zone that reduces the damage and conflict risk between the protected forest and urban development zone, and 3) the hierarchal green spaces from urban secondary forest zone to a communal garden which ensures the provision of contiguous forest structure at neighborhood scale (Fig. 2).

The *Rimba Kota* provides a platform to explore creative ecological and socio-economic insights that contribute to the sustainability of the proposed smart forest city. For instance, the productive secondary forest is planned to provide community farms, nurseries, botanical garden center, and ecotourism to support socio-economic development through forestry practices within the city. The spatial setting and socio-economic aspects of the forest, including the



3. KIPP's biodiversity forestry plan and forestry initiative.

plant communities and the forest principle with its full extent, show a capacity to steer urban development. The forest's influence is strongly present at all scales in the project. Whilst at the smallest scale, it is recreating the forest environment on each development parcel.

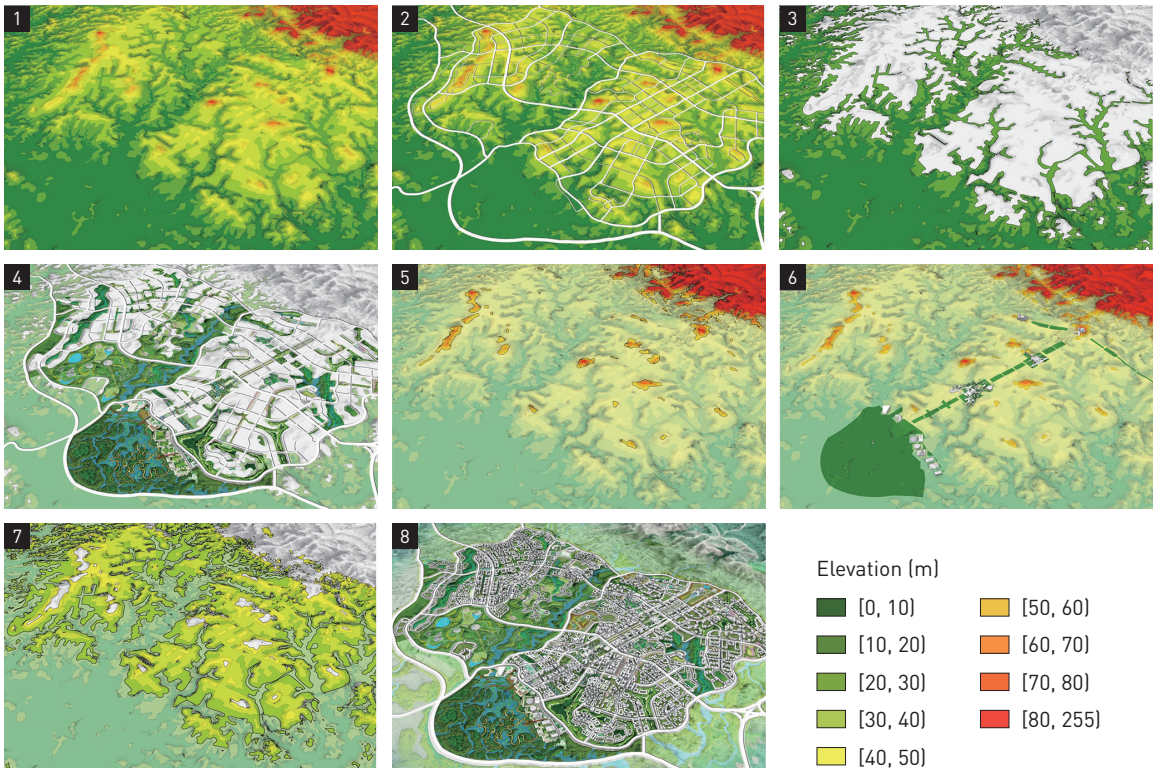
2.3 Forest Succession and Management

Biodiversity is a key factor underlying the resilience of forest ecosystems and trees to existing stresses and is a basic ingredient for building their adaptive capacity in the face of future stresses[11]. There are some potential biodiversity-related actions to maintain or escalate forest resilience, including conserving functional diversity and natural forests to replace homogenous or species-reduced plantations[12]. Through KIPP's urban forestry initiatives (Fig. 3) and horticultural processes, the existing production forest will be restored with diverse native forest species that can slowly replace the homogenous species over managed periods.

Forest restoration is defined as "actions to re-instate ecological processes, which accelerate recovery of forest structure, ecological functioning, and biodiversity levels towards those typical of climax forest, i.e., the end-stage of natural forest succession"[13]. This mega project needs provisional themes of a schematic outline, which exhibits "the processes over time, staging of the surface, the operational or working method, and the imaginary"[7]. Re-establishing functions of a forest ecosystem before building a city should be done by stages, requiring a long process. The new vegetation is expected to grow onto the existing lowland forest plant community in the mangrove forest along the waterways next to Balikpapan Bay (*Teluk Balikpapan*). Biodiversity forestry initiatives proposed by the project set a major timeframe to establish, mature, and connect the forest ecosystem of KIPP throughout the city.

3 Creating the Co-Existence Living of the New Capital City and Forest Ecosystem

The capital city relocation poses a unique opportunity to create a better future city model. *Nagara Rimba Nusa* encourages interaction between urbanism and forest by bridging the existing nature with a desired built environment through distinct design approaches. The design of KIPP emphasizes the design values of 9 Big Moves through comprehensive urban design frameworks, accommodating three pillars of the IKN vision—representing Indonesia's identity; realizing sustainability in economy, society, and environment; and creating a smart, modern, and international standard city. The 9 Big Moves include the representation of the Almighty/divinity–Human–Nature; national great values; the symbol of the unitary state government; sustainable development; forest city; sustainable mobility; smart city; smart mobility; and



1 Elevation modeling and analysis
2 Dynamic road networks placement following land contour
3 Valley and riparian area identification
4 Potential landscape and riparian area to be preserved
5 Hill and slope identification
6 Potential hilly area for landmark and forest preservation
7 Development area identification
8 10-minute city plan iteration

4. KIPP's land forming process.

smart infrastructure. All the values reinforce the interplay design between urban and forest environment. Moreover, the design is embedded in a future-ready infrastructure network within the forest landscape system, envisioned to establish a reliable urban built environment, enable nature to penetrate urban blocks, and create space for rainforest regrowth.

Building a smart city has arisen as one of the main goals, where digital-based planning and advanced smart building technology are applied to maximize the responsive urban design concept. Creating a smart city means preparing a future-ready urban environment, in both infrastructure and human resource aspects, to make the smart ecosystem work appropriately. However, denoting a "smart city" could also be understood to make transformations through careful looking and listening to the basic values of Indonesia's unique nature and culture as the foundation to move forward.

3.1 Green Ecological Corridors as Planning Foundation

The planning of KIPP was inspired by nature and endeavors to preserve the site's natural ecosystem (Fig. 4). The existing landscape is a strategic asset for the development of KIPP. Sensitive approaches to the environment become the key platform of KIPP's land forming processes. The urban structure was placed upon the site's elevation modeling analysis to define the possible development area. Green ecological green corridors were drawn as the foundation to define urban fabric and a linkage to nature, where biodiversity preservation is proposed by reallocating and reinstating the native flora and fauna. Nature preservation in KIPP also highlights the riparian ecosystem through Water Sensitive Urban Design (WSUD) approaches. Moreover, rainwater harvesting and management are crucial to ensure stormwater management through conserving, harvesting, reusing, and recharging strategies.

In the land forming process of KIPP, landscape urbanism plays an important role in creating and shaping the dynamic urban tissues that rely on the area potentials. Just as Kelly Shannon stated in *Return to Landscape Urbanism*, the landscape itself is a high-performance nature and hybrid ecologies[14]. It could establish dynamic systems that are between urban and rural, built and unbuilt, and the related areas of design, engineering, and management.[14] The integrated cross-scale and multi-disciplinary approaches in KIPP's design process are creating a balance between nature and built-up areas through urban layers that could secure the landscapes as the living foundation of the site.

3.2 Forest Morphology Reflection Through Biophilic and Biomimicry Concept

The design concept of *Nagara Rimba Nusa* begins upon reflections of finding clues from the existing beautiful landscape

of Borneo's forest, especially from the given site context. The design emulates the elements of the rainforest into the urban context through some clues from the nature, such as emergent canopies of rainforest harnessing the solar energy, the understory interconnecting different structural elements, the forest floor utilizing permeable surfaces to absorb nutrients, and the buttress roots building efficient conduits with a strong foundation (Fig. 5). The biophilic and biomimicry concept becomes the fundamental architectural ideas for all buildings in KIPP as the response towards the existing unique nature, winding topography, and landscape. By adopting the natural morphology of Borneo's landscape as an ecological model, the concept can be translated into sustainable built environment planning.

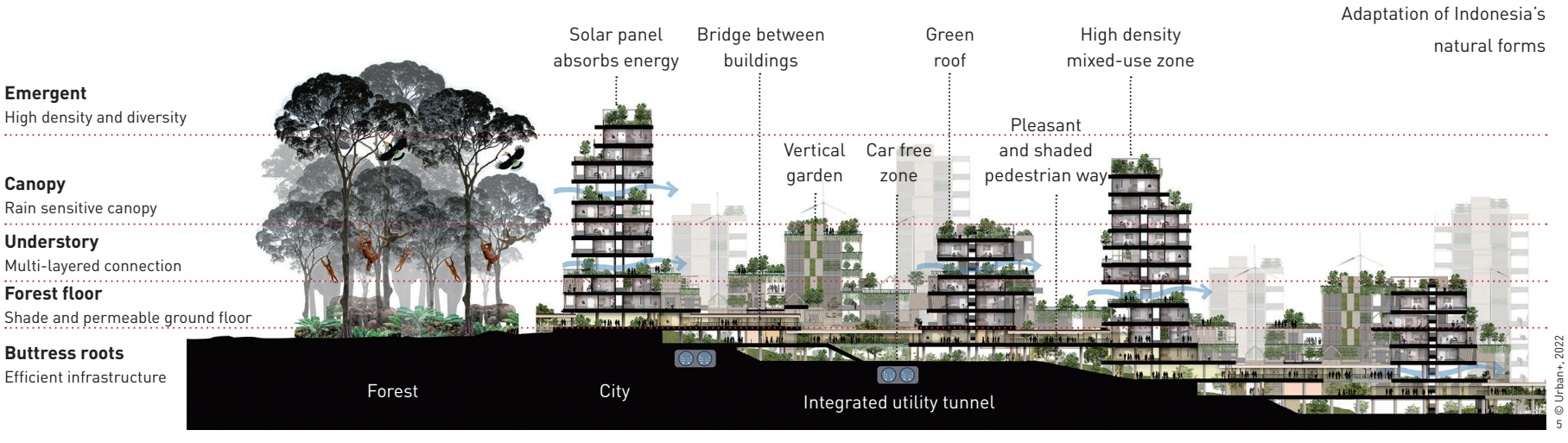
3.3 Performance-Based Design for Urban Development Guidance and Control

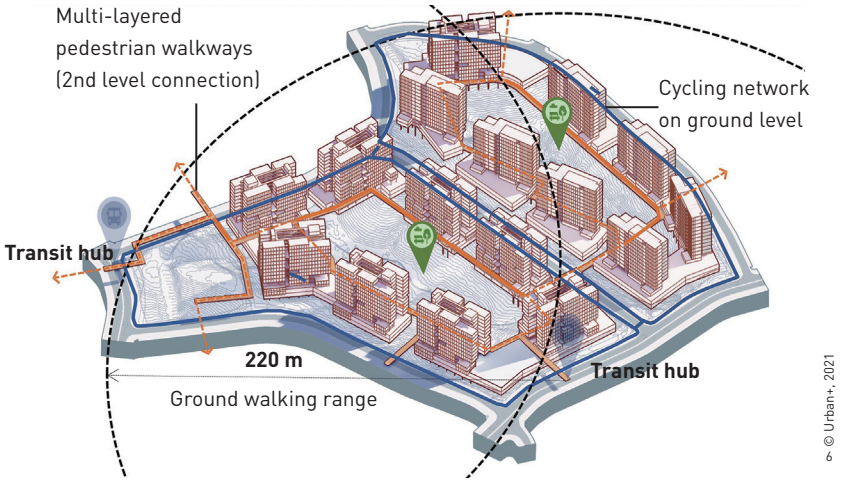
Directed by KPIs, a performance-based design approach is applied to achieve and guarantee the best quality and create a smart urban environment. The KPIs play as control tools to monitor and enhance the capital's ability to achieve the IKN vision. The KPIs were set as the ethical guidelines in placing the urban setting in the most respectful way. There are five dimensions of KIPP's KPIs, i.e., public welfare, ecology and habitat preservation, connectivity/transportation, urban infrastructure, and information and communication technologies (ICT) infrastructure, which were further developed into sub-dimensions and detail indicators to guide the development of the city's urban systems and set standard for all the urban elements. With the KPIs, this project strives to control the persistent and accountable urban development of KIPP according to targeted performance values such as 10-minute city, 65% ~ 70% of green coverage, 80% trips by public transportation, 80% of energy uses by alternative energy sources, a reduction of the temperature by 2°C, zero emissions, and smart metropolis with ICT-based system and monitoring. *Nagara Rimba Nusa* also proposed to apply emerging smart infrastructure schemes planned through data-driven Internet of Things (IoT) and connected to the command center to ensure urban performance optimization and efficiency. All the KPIs are today working as the control tools on the planning process and expected to guide the construction implementation and city maintenance.

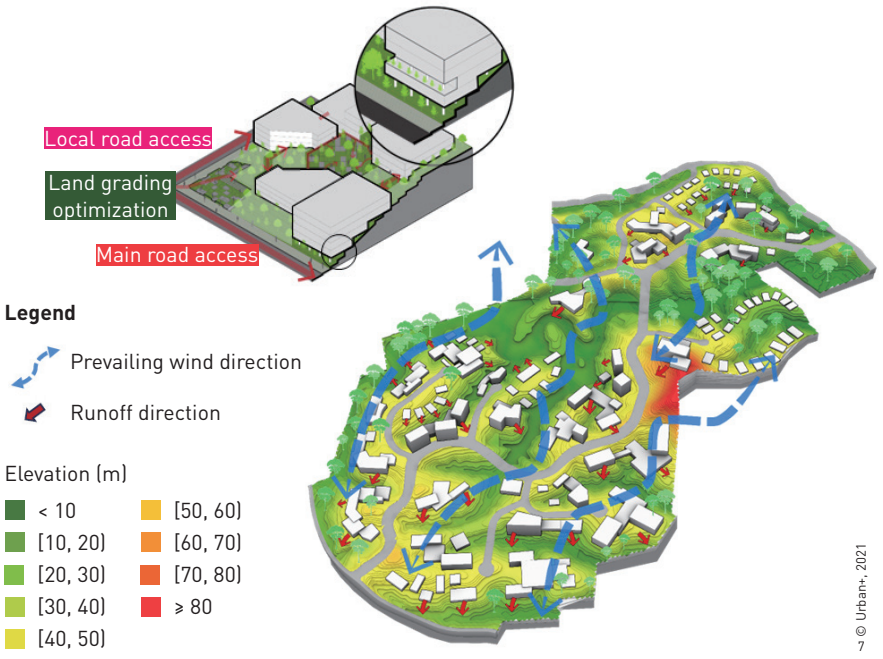
3.4 10-Minute City Model Implementation

The design of the KIPP considers the existing forest's land capacities and ecosystem, planning a compact city with the 10-minutes city concept derived from Carlos Moreno's "15-minute city" concept developed in the city of Paris[15]. It highlights the decentralized urban area where residents live within 10-minute distance to workplace and all public services by walking, cycling, or public transportation. KIPP's 10-minute city concept is entangled with the transit-based polycentric city model and inspired by Indonesian archipelago. Based on these models, the design constructs an urban structure that appears as urban fabric clusters within the lush green forest corridors. This urban structure is believed to derive a more sustainable and high-quality life for residents as they live closer to basic services.

5. Biophilic and biomimicry concept of KIPP: adaptation of Indonesia's forest natural forms.







6. Multi-layered mobility system of KIPP.
7. The minimum cutting-and-filling strategies on the slope design of KIPP.

3.5 Green Mobility Oriented to Pedestrians, Cyclists, and Integrated Public Transportation

The 10-minute city model reinforces the importance of green mobility through walking, cycling, and transit-based mobility system. Pedestrians and cyclists have priority, though the existing landform is a big challenge to make a comfortable walking and cycling environment. Urban Network Analysis (UNA) studies were conducted to estimate walking distance based on the site condition with an average land slope of 20%. Urban walkable system was proposed based on multiple walkability studies such as slope and walking pace, the 15-minute city's mobility shed[16], the pedestrian ramp slopes standard (maximum slope of 7%), and transit-oriented development mobility radius standard. Through parametric analysis, the walking range for KIPP was specified as 5-minute walking (220 m) from the transit hub and 10-minute walking (440 m) from city-scale transit hub. Multi-layered pedestrian walkways and cycling path connection system were designed continuously to ensure the seamless connectivity across the city (Fig. 6). In the big picture, the green mobility concept was structured within the public transport mobility system across IKN. The development of road infrastructure would be managed carefully with minimum cutting-and-filling, and the slope design is also considered for the Bus Rapid Transit (BRT) system (Fig. 7).

3.6 Compact Layered City Development Approach

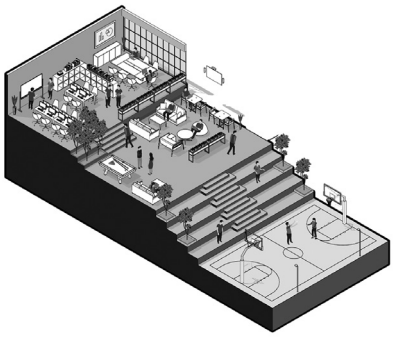
Multi-layered vertical development emerges as the main design strategy at various scales from city to building, considering the existing challenging topography and forest environment. A compact city design is applied through level stacking and multi-layered ground levels to intensify multi-programs vertically and preserve the underneath forest ecosystems. Mid- to high-density residential towers are proposed to shift Indonesian's horizontal residential culture (*kampong*) to vertical future villages for high-efficiency and flexible land development. Meanwhile, transformation in working culture, which encourages multi-sectoral collaboration is proposed by a consolidated and interconnected complex plan with hybrid and seamless workplaces, multi-layered office programs, and an integrated green work environment (Fig. 8).

A collaborative and high-performance green district is intended to encourage multi-sectoral collaboration, as well as to reinstate ecological connectivity through the continuous open spaces in the urban area. Different functioning zones are layered and combined together, including collaborative spaces, pedestrian zones, green spaces, amenities, and future-ready infrastructure (Fig. 9). Taking ecological responsibility, compact layered development approach helps reduce the massive building plot ratio and conserve the natural environment with few interventions.

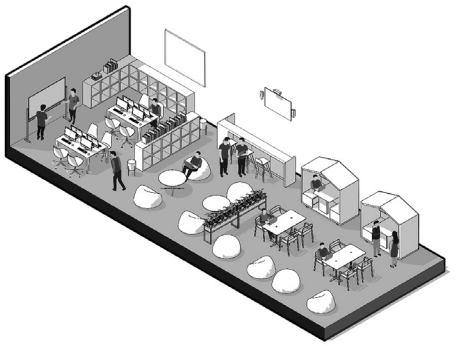
4 Conclusions

The KIPP's development is planned on consideration of the sensitive environment of Borneo's forest. Derived from nature, *Nagara Rimba Nusa* takes the forest and riparian area as the main spine of the design approach. Topography and natural elements

Hybrid workplace



Multi-layered program



Integrated zones

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of existing landscape fundamentally organizes KIPP's cityscape, constructs the urban structure, and redefines the typology of green space. The orchestration of forest ecosystem and urban development suggests that the city is able to be part of the urban ecology through the entanglement of green network and compact city.

The KIPP's design strategies present how urban development could develop in more respectful ways that look-up to the values of mother earth as the baseline and inspirations. Forest urbanism is portrayed as a development agent and way of thinking to view, understand, and embed the urban form of KIPP into Borneo's Forest ecosystem, allowing for the reconnection of the forest's natural landscape and urban development through a distinctive process of co-dependency and layering systems. (Re)profiling the existing landscape becomes the foundation that initiates KIPP's spatial structure reposition. Despite amplifying deforestation, urban development could coexist with the forests and bring opportunities for reforestation. The environment-focus design is the key to bringing the urban development into the natural settings and cherishing them together as one ecological system.

The notion of forest urbanism in *Nagara Rimba Nusa* contributes to re-thinking and re-creating city's development in tackling climate change. Built on the planning foundation of green ecological corridors, the urban fabrics and building blocks would be constructed while conserving the forest morphology and adapting to the forest environment. Applied with green building principles, compact layered city is further developed as the main approach to optimizing the land efficiency. The 10-minute city model could accentuate the vitality and the mobility efficiency of the city with decentralization of the basic services. In parallel, the design

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8. Transformation in working culture of KIPP.
9. An exemplary building of multi-layered vertical development.

highlights the green mobility concept which prioritizes pedestrian connections, cycling networks, and public transportation systems. Further, performance-based design enfolds the above design initiatives as a development guidance and a control tool to ensure that the plan works accordingly.

The above approaches form the innovative planning of KIPP, comprise of the reflection on environment and culture, and bridge with the compact city and smart city approaches. All the concepts intertwine to create a new perspective and a way of conceiving an ideal city that fits in the context of forest environment. Nature is the foundation and inspiration to move forward, while the advanced technologies are embedded as tools to maximize the city performance to be working as planned.

With comprehensive understanding and response towards the existing forest environment, the new capital city development has the potential to sustainably improve the quality and expand the area of nature and living environment. Through the above plans, strengthened regulations, and strict implementations, the co-existence of urban development areas and forest environments would be possible to achieve.

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Competing interests | The authors declare that they have no competing interests.

REFERENCES

[1] Lechner, A., & Sibarani, S. (2022, April 28). *New capital city—A model for sustainable urban transformation?* The Jakarta Post.

[2] Hairah, U., Tejawati, A., Budiman, E., & Agus, F. (2017). Borneo Biodiversity: Exploring Endemic Tree Species and Wood Characteristics. In: L. S. Riza, A. Pranolo, A. P. Wibawa, E. Junaeti, Y. Wihardi, U. R. Hashim, S. Horng, R. Drezewski, H. S. Lim, G. Chakraborty, L. Hernandez, & S. Nazir (Eds.), *3rd International Conference On Science in Information Technology (ICSItech)*. IEEE.

[3] Gaveau, D. L., Sheil, D., Husnayaen, Salim, M. A., Arjasakusuma, S., Ancrenaz, M., Pacheco, P., & Meijaard, E. (2016). Rapid conversions and avoided deforestation: Examining four decades of industrial plantation expansion in Borneo. *Scientific Reports*, (6), 32017.

[4] Hakim, C. (2021, March 11). *A recipe against disaster: Inside Indonesia's ambitious plan to build a new capital* (K. Xie, Ed.). Berkeley Economic Review.

[5] MacKinnon, K., Hatta, G., Halim, H. & Mangalik, A.(1997). *The Ecology of Kalimantan* (Vol. 3). Oxford University Press.

[6] Hight, C. (2003). Portraying the Urban Landscape: Landscape in Architectural Criticism and Theory, 1960–Present. *Landscape Urbanism: A Manual for the Machinic Landscape* (pp. 22–32). Architectural Association Publications.

[7] Corner, J. (2006). *Terra Fluxus. In: C. Waldheim (Ed.), The Landscape Urbanism Reader* (1st ed., pp. 21–33). Princeton Architectural Press.

[8] Padoch, C., & Vayda, A. P. (1983). Patterns of Resource Use and Human Settlement in Tropical Forests. In: F. B. Golley, & H. Lieth (Eds.), *Tropical Rain Forest Ecosystems, Structure and Function*. Elsevier.

[9] Kartawinata, K. (1984). *Environmental effects of different kinds of land use*. Indonesian National MAB Committee.

[10] Dove, M. R. (1983). *Forest preference in swidden agriculture*. Tropical Ecology, 24(1), 122–142.

[11] Braatz, S. (2012). Building Resilience for Adaptation to Climate Change Through Sustainable Forest Management. In: A. Meybeck, J. Lankosk, S. Redfern, N. Azzu, & V. Gitz (Eds.), *Building Resilience for Adaptation to Climate Change in the Agriculture Sector* (p. 117). FAO/OECD.

[12] Thompson, I., Mackey, B., Mcnulty, S., & Mosseler, A. (2009). *Forest Resilience, Biodiversity, and Climate Change. A Synthesis of the Biodiversity/Resilience/Stability Relationship in Forest Ecosystems*. Secretariat of the Convention on Biological Diversity.

[13] Elliott, S., Navakitbumrung, P., Kuarak, C., Zangkum, S., Anusarnsunthorn, V., & Blakesley, D. (2003). Selecting framework tree species for restoring seasonally dry tropical forests in northern Thailand based on field performance. *Forest Ecology and Management*, (184), 177–191.

[14] Shannon, K. (2011). Return to Landscape Urbanism. In: V. Ferrario, A. Sampieri, & P. Viganò (Eds.), *Landscape of Urbanism*. Officina Edizioni/IUAV.

[15] Moreno, C., Allam, Z., Chabaud, D., Gall, C., & Pratlong, F. (2021). Introducing the "15-minute city": Sustainability, resilience and place identity in future post-pandemic cities. *Smart Cities*, 4(1), 93–111.

[16] Duany, A., & Steuteville, R. (2021, February 8). *Defining the 15-Minute City*. Public Square.

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城市－森林－岛屿：营造和谐共生的印度尼西亚新首都与婆罗洲岛森林生态系统

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摘要

印度尼西亚计划从2024年起逐步将首都由雅加达迁至婆罗洲岛的东加里曼丹省。婆罗洲岛因丰富的生物多样性和庞大的热带雨林生态系统而闻名。2019年，在新首都核心政府区的设计竞赛中，Urban+设计事务所的“城市－森林－岛屿”（*Nagara Rimba Nusa*）方案胜出，其理念是建造一座可以体现印度尼西亚本地文化和森林智慧的城市。方案围绕森林生态系统展开设计，呈现了城市形成的过程，同时应用响应式设计，营建自然启发式建筑，将城市规划和自然保护相结合，创造全新的工作、生活、交通和文化体验。本文介绍了项目如何在景观都市主义的指导下，提出一种新的城市形态——这种城市环境和森林景观相互交织的有机体，展示了不同尺度下城市绿色开放空间设计和城市森林恢复与管理规划。项目还提出，为实现城市与自然的共生，新首都应以绿色生态廊道为规划基础，通过反映热带雨林元素的亲生物和仿生学设计，基于城市发展绩效对规划与设计进行指导和把控。项目基于场地现状提出了“10分钟城市”的紧凑型城市规划概念，计划建立以步行、骑行和公共交通为主的绿色交通体系。在新首都核心政府区的设计策略中，景观都市主义成为发展的动力和思维方式，用以理解并将城市形态嵌入婆罗洲的森林生态系统。通过上述新视角和设计手段，“城市－森林－岛屿”方案构想出了一个适应森林环境的理想城市。

关键词

景观都市主义；
森林都市主义；
本地智慧；
努桑塔拉；
城市－森林－岛屿；
首都

文章亮点

- 结合印度尼西亚当地自然智慧和景观都市主义进行新首都的可持续性环境营建
- 提出一种新的城市形态，使建成环境和森林景观形成一个有机体
- 提出以“10分钟城市”模式和绿色交通系统为导向的多层级紧凑型城市

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