

# Environmental implications of Indonesia's new planned capital in East Kalimantan, Borneo Island

## SUMMARY

Despite assurances that Indonesia's new planned capital in East Kalimantan will be sustainable, there are well-founded fears that it will cause massive environmental damage to Borneo island, one of the world's most important biodiversity hotspots and carbon sinks. This policy brief examines the potential impacts and suggests how the capital move can be a catalyst for improving environmental performance in Borneo and Indonesia.

Indonesia's current national capital Jakarta, a burgeoning megacity, is an "urban nightmare" already hobbled by traffic congestion, dense housing, waste collection, air pollution, water supply, drainage and flooding problems, and expecting to face significant climate vulnerability in the future. Numerous past Indonesian presidents have considered moving the capital to alleviate or avoid Jakarta's urban problems, while also bringing additional socio-political benefits.

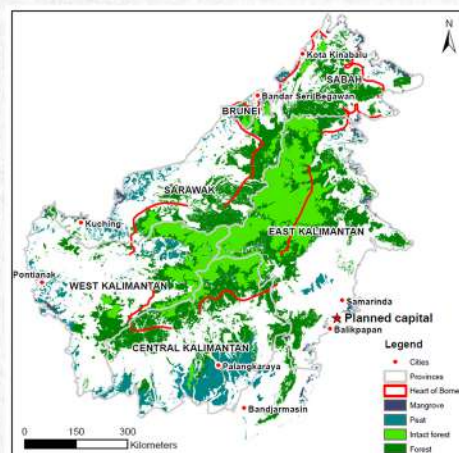
Indonesia's current President Joko Widodo (Jokowi)'s administration announced on 26 August 2019 plans to move the capital to the island of Borneo. The new planned capital would be located near the coast between the cities of Balikpapan and Samarinda, in East Kalimantan Province, on land located in Kutai Kartanegara and North Penajam Paser regencies (see Figure 1). The site of the new capital, as yet unnamed, enables it to take advantage of existing infrastructure and is relatively free from natural hazards. The apparent seriousness of these plans has sent land prices in the proposed site soaring, with fervent discussions from civil society actors and environmentalists bracing for the potential implications.

The new capital is envisioned to be a "smart, green, beautiful and sustainable city", providing a high quality of life for its projected 1.5 million inhabitants with ample greenspace, unlike overcrowded and sinking Jakarta. It is possible for cities to be environmentally-friendly and livable, with good urban planning minimizing direct impacts on the local environment, such as deforestation,

water extraction, and pollution, while higher population densities in cities can also improve resource-use efficiency. For example, some cities such as Vancouver, Zurich, and Singapore have ranked highly on sustainability and livability indices.

However, cities typically have large ecological footprints, especially on their surrounding hinterland. As such, there are fears that shifting the national capital and economic activity to the edge of Borneo could accelerate deforestation and resource extraction. In turn, this may degrade one of the world's most important, yet vulnerable, biodiversity hotspots and carbon sinks, which conservationists are already battling to protect.

In this brief, we summarize some of the key points from a recently published coarse-scale assessment of the potential scale, magnitude, and timeline of direct environmental impacts arising from the move of Indonesia's capital to Borneo (Teo et al., 2020, Land 9, 438).

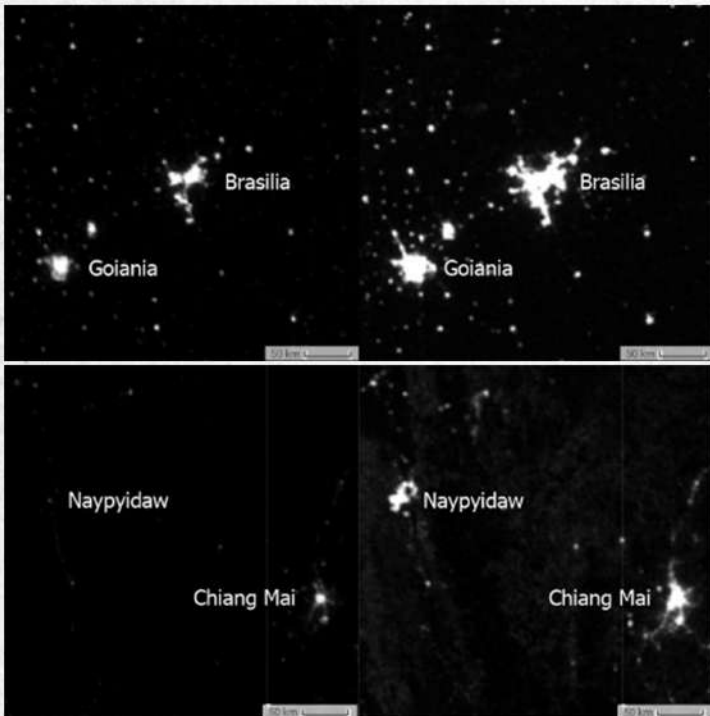


**Figure 1.** Map of Borneo showing important natural land covers, the Heart of Borneo ecoregion, protected areas, and the location of the new planned capital between the cities of Samarinda and Balikpapan. Source: Teo et al., 2020.

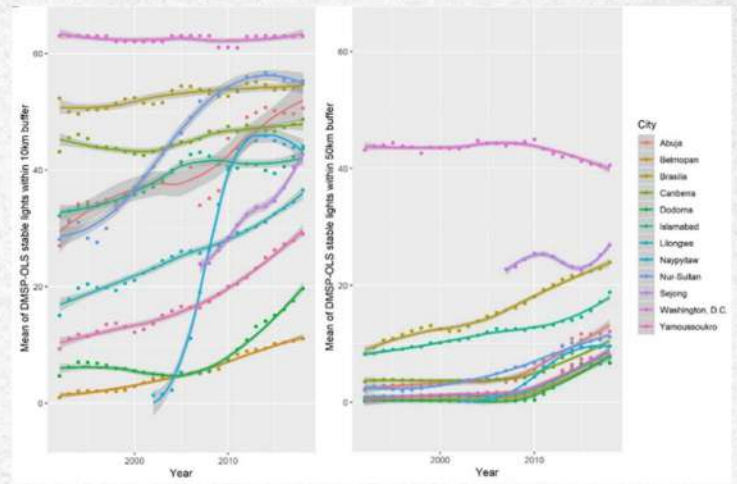
## Precedents of Planned Capitals

There are only a few examples of planned capitals in modern times. Nevertheless, understanding how planned capitals in particular, and cities in general, affect the environment can provide important lessons for the Indonesian context in assessing its potential impacts and formulating mitigation strategies.

This can be done using qualitative methods to understand the socio-political processes affecting environmental impacts, and quantitative methods to quantify the spatial footprint and impacts. Satellite imagery of nightlights (Figure 2) have been frequently employed in urbanization studies to quantify urban growth and intensification trajectories. Nightlights provide an opportunity to independently monitor anthropogenic activity from space, including in developing countries for which other datasets may be sparse or inaccurate. In our study, we analyzed historical nightlight intensity to characterize the growth trajectory and extent of urban impacts in 12 previous planned capitals from throughout the world. These 12 planned capitals showed vastly different growth trajectories (Figure 3).



**Figure 2.** Examples of nightlights indicating city expansion from 1992 to 2013 for (a) Brasilia, Brazil, and (b) Naypyidaw, Myanmar. Source: generated by authors from NASA DMSP-OLS satellite.



**Figure 3.** Mean stable nightlights within 10 km and 50 km buffers of existing planned capitals, showing high initial growth rates within 10 km of the core after construction, with urban expansion and intensification between 10 and 50 km from the core possible for several decades more. Source: Teo et al., 2020.

## Spatial Footprint and Impacts

Early plans from the Indonesian planning ministry suggest that construction of the new capital could begin in 2021, with the first 20 km<sup>2</sup> phase completed by 2024, expanding to 2,000 km<sup>2</sup> by 2045. A buffer distance of 30 km around the new capital would result in a terrestrial footprint over Borneo island of around 2,260 km<sup>2</sup>. Based on the results of our analyses, these estimates appear to be realistic, as larger countries such as Indonesia (270 million population) can support large and populous capitals, due to their political role in exerting control over a larger territory and thus attracting more urban activities, resources and migrants. For example, the largest planned capital in our set is Washington, D.C. (USA, 331 million population) occupying 3,320 km<sup>2</sup> in 2018, followed by Brasilia with 1430 km<sup>2</sup> (Brazil, 213 million population).

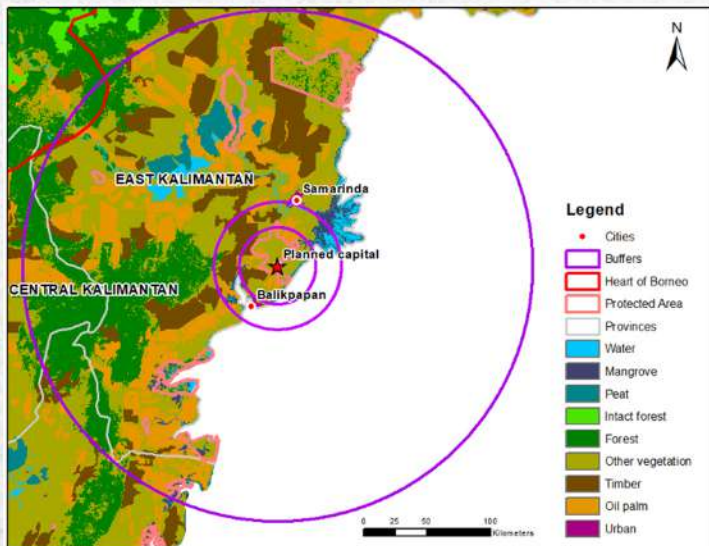
The degree to which urban activities and functions were successfully relocated to the new capital also determines its size. Some capitals such as Tanzania's Dodoma and Cote d'Ivoire's Yamoussoukro remain small and host only limited administrative functions, with construction hobbled by a lack of funding or political feuding. For others, such as South Korea's Sejong and Myanmar's Naypyidaw, other urban activities such as commerce and recreation gradually picked up as government functions in the new capital increased.

For Indonesia's new planned capital, the area within a 10 km radius includes the protected Bukit Soeharto Grand Forest Park (167 km<sup>2</sup> within 10

km). From 30 km onwards, mangrove and peat ecosystems could also be affected, while a total of 4,360 km<sup>2</sup> of protected areas lie within a 200 km radius (Figure 4).

We estimated that carbon dioxide release from deforestation (aboveground biomass loss) directly within the new capital's footprint of a 30 km<sup>2</sup> radius would be 50 MtCO<sub>2</sub>e, equivalent to 2.7% of Indonesia's greenhouse gas emissions in 2014. Actual direct emissions are likely to be higher due to additional contributions from soil biomass, especially carbon-rich peatlands, and other anthropogenic activities.

Deforestation within a 200 km radius, due to indirect impacts from the new capital such as migrants moving in, increased demand for resources, and infrastructure facilitating access to the forest by loggers and settlers, would release carbon dioxide (2,326 MtCO<sub>2</sub>e) equivalent to 126% of Indonesia's 2014 greenhouse gas emissions.



**Figure 4.** Land cover map of the area on Borneo surrounding Indonesia's new capital, with 30, 50 and 200 km buffers indicated around the planned capital. Source: Teo et al., 2020.

## Socio-political Geographies of Planned Capitals

Many examples of capital relocation (e.g., Abuja, Nur-Sultan, and Brasília) involve a move to the interior or a more central geographic location to promote economic development and national unity, also to avoid regional rivalries. Similar arguments have been cited for the Indonesian move: to stimulate economic growth outside Java and alleviate regional concerns about the Java-centric political system. However, a more

inland location can accelerate environmental damage to previously less accessible areas, as Brasília's experience shows. Fortunately, a coastal site was chosen for the new Indonesian capital. However, this alone may not prevent further indirect impacts on Borneo; for example, East Malaysian ministers are already planning for the Trans-Borneo Highway which will cut through the Heart of Borneo ecoregion to the new capital.

Many planned capitals were built at low density, with wide boulevards and ample green space for their inhabitants. However, this can lead to sprawl and larger land-use footprint, as well as reduce efficiencies that come with high-density development. Planned cities often possess a well-controlled core, too expensive for ordinary residents who are pushed to the margins, such as in Malawi's planned capital Lilongwe, where the excluded urban poor were forced to walk long distances to employment due to the lack of affordable transport and sprawling city layout. Planned cities often perpetrate and sustain existing power structures, which the new capital could do at multiple scales, shielding the elite from civil disaffection in Jakarta, while excluding the local poor and marginalizing indigenous tribes.

National capitals wield power, establish a national identity, and represent a nation to itself and outsiders. Planned capitals in particular, with notable examples such as Naypyidaw and Nur-Sultan, offer a blank slate to be populated with monuments, symbols, and icons in service of state narratives. Under Sukarno, Jakarta's core was beautified with monuments and squares to "show off the pride of Indonesia". However, behind the beautiful monuments and facades, the realities of life in the capital both symbolically and in actuality define the nation. If the new capital leaves behind a legacy of environmental damage and social division, it will not become a symbol of pride but failure.

The new capital should thus be seized as the catalyst to transform the nation and start doing things right, socially and environmentally.

## Key Recommendations - Best Practices for Protecting Borneo

Indonesia is already facing many environmental challenges and threats to biodiversity, which the new capital could aggravate without timely and effective action. We, therefore, recommend for any planning and development to:

- Seriously and transparently implement Environmental and Social Impact Assessments, as well as Strategic Environmental Assessments, with proper accountability to local and international stakeholders.
- Apply the mitigation hierarchy to minimize negative impacts on the environment and even aspire towards overall net gains, with requirements to (1) avoid, (2) minimize, (3) remediate, and (4) offset biodiversity loss.
- Study and adapt examples of ecological offsets and compensation.
- Extend and enforce protected areas; ensure they are irrevocable and effectively managed.
- Fair, prior, and informed consent (FPIC) involving local peoples should be mandatory for all projects.

- Prevent large-scale infrastructure development within the Heart of Borneo using - connecting the capital with other population centers - as a justification.

The onus lies on the Indonesian government to implement these best practices among its agencies and to impose enforceable requirements on the private sector. Persistent attention from the scientific and international community, as well as capacity-building efforts, is also needed. The natural ecosystems and biodiversity hotspots of Borneo represent a shared heritage common to humanity and should therefore also be of international interest.

## FURTHER READING

1. Teo, H. C., Lechner, A. M., Sagala, S. & Campos-Arceiz, A. Environmental Impacts of Planned Capitals and Lessons for Indonesia's New Capital. *Land* **9**, 438 (2020). <https://doi.org/10.3390/land9110438>
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