Ibu Kota Negara: the New Capital

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SMT201 Team 9

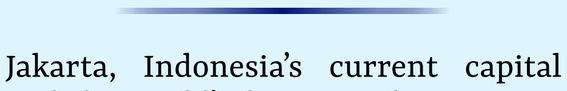
Issues

Jakarta, Indonesia's current capital and the world's fastest sinking city, is under the threat of going underwater, and its status as a capital city `unsustainable`.

Motivations

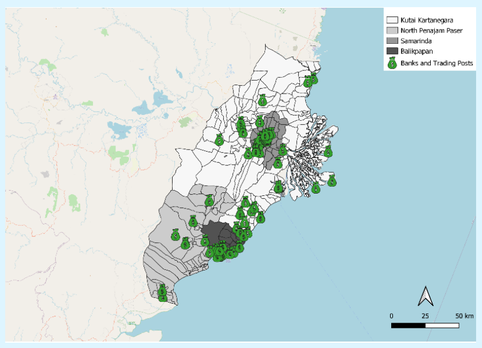
With proposed plans to `shift the new capital` to **East Kalimantan**, Borneo to ease the current pressure on Jakarta, a new suitable site has to be selected that can cater to the future demands of Indonesia's capital.

Our Study Area



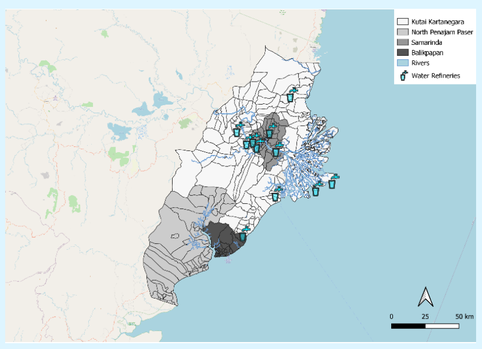
For our study area, it includes sub-districts of **Kota Balikpapan**, **Kota Samarinda**, selected districts and sub-districts of **North Penajam Paser** and **Kutai Kartanegara** Regencies.

Economic Activities



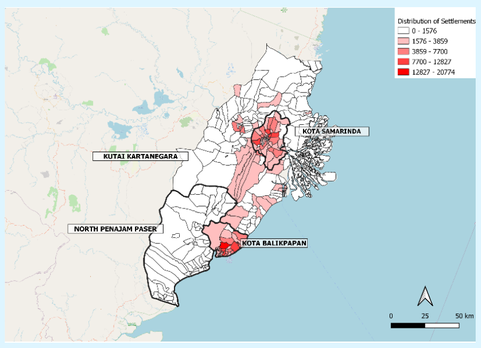
Locations of Banks and Trading Posts are **highly prominent** in sub-districts within Kota Balikpapan and Kota Samarinda, indicating **greater economic presence**.

Water Sources



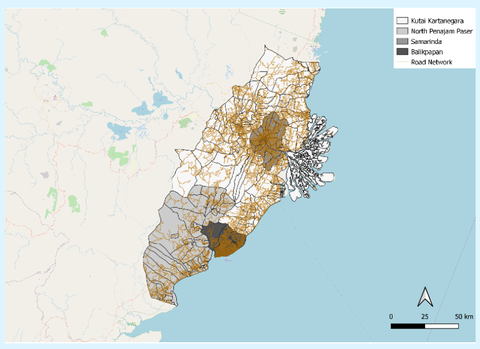
Water refineries are close to **coastlines** and **major rivers** that run through the heart of Kota Samarinda, making sub-districts along waterways ideal places for water refineries for supplying clean water to other sub-districts in East Kalimantan.

Settlements



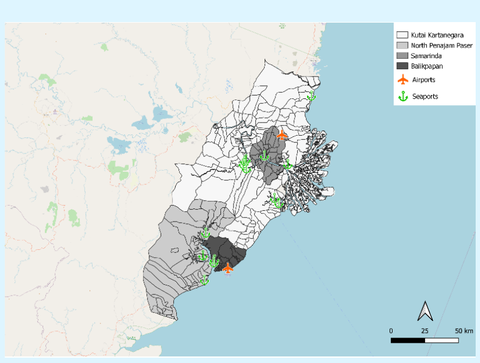
Settlement density is clustered around areas in Kota Balikpapan and Kota Samarinda, plausibly due to more **economic activities** and **job opportunities** that attract **migration**.

Roads



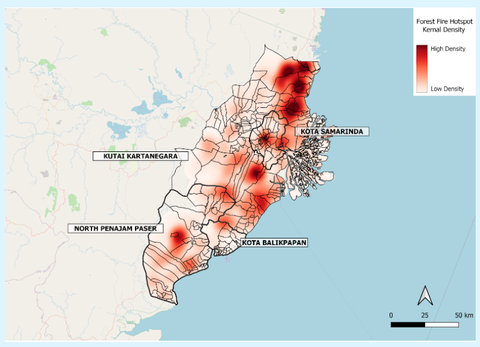
An extensive road network is present in the study area. With Samarinda and Balikpapan being major economic hubs in East Kalimantan, both expectedly have **relatively higher density** of roads and streets.

Airports and Seaports



Two airports present, one in Kota Balikpapan and another in Kota Samarinda, are **well accessible** by major main roads. With **14** sea ports, this could imply more of the economic activities taking place involve **transportation of goods**.

Forest Fires



Northern Kutai Kartanegara has the highest density of forest fires, likely due to vegetation cleared for the palm oil trade using slash-and-burn.

Approach

1. Observed traits of Study Area
2. Selected significant factors to consider
3. Rasterized layers with relevant layers
4. Carried out AHP analysis for each factor
5. Combined multiple maps and weighted each factor using AHP weightages
6. Shortlisted sites based on ***threshold >0.4***

Interest Groups

These groups have a notable stake in the re-location of the new capital.
1. Environmental Groups
2. Urban Planners and Developers
3. Government Bodies
Given various concerns they possess, these will be factored in our site suitability analysis.

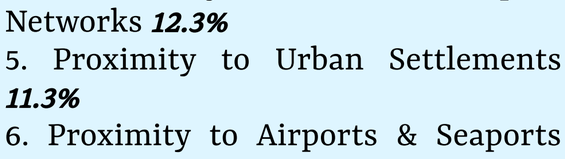
Multi-Criteria Evaluation

We have selected and weighted **important factors** that we have accounted for during site selection.
1. Forest Fire Risk Areas ***24.8%***
2. Presence of Slopes ***19.3%***
3. Natural Disaster Risk Areas ***19.3%***
4. Accessibility to Roads & Transport Networks ***12.3%***
5. Proximity to Urban Settlements ***11.3%***
6. Proximity to Airports & Seaports ***7.8%***
7. Proximity to Natural Forests ***5.3%***

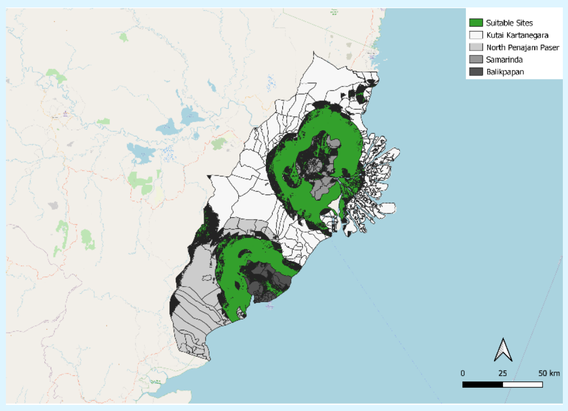
An AHP suitability layer was generated with a **consistency check** of `7%`. To standardize factors shown, the following formula was used:

$$z = \frac{x - min(x)}{max(x) - min(x)}$$

where z is the z-score (with values of 0-1), and x refers to individual values. Individual z-scores were **combined** to form a **composite suitability layer**.

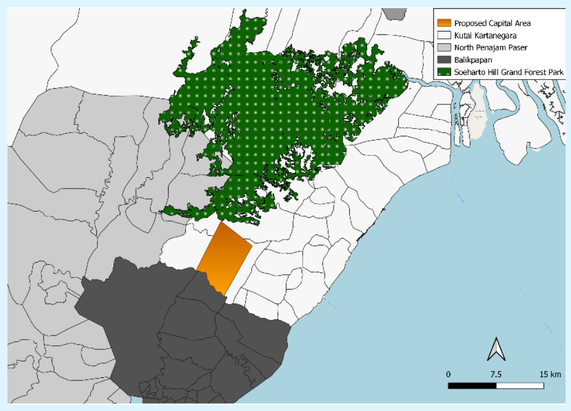


Result of AHP analysis



Our Chosen Site

Our proposed site would be located within **Karya Merdeka** and neighbouring **Sungai Air Merdeka**.



Limitations

For our AHP consistency check, it yielded a result of 7% which although is an acceptable figure, does imply some level of inconsistencies with our judgements. This figure could be improved through **further in-depth consideration** of the numerical figures we used for each value.

To re-locate and build a new capital city is definitely no easy feat. We have covered 7 variables to consider when selecting the new site, however there are countless other factors that should also be weighed in. Through the **consideration of more factors**, our analysis can become more accurate and fitted for the needs of the new capital.

Future Work

Our team would recommend the use of **geological layering**, which provides data about the soil series of proposed sites, which can improve decision making by architects and urban developers when designing buildings and infrastructure, helping to ensure **material used in construction** is of the **right quality and consistency**.

Spatiotemporal analysis can also be utilized that will allow planners to identify patterns over time and take actions accordingly. Accounting for shifts in areas such as the climate over the years in building up the new capital area, is essential for the **sustainability** of the city in the long term.

We can consider enlisting the **help of residents** of East Kalimantan who can offer a more unique and nuanced perspective for the location of the proposed capital, to gain **further insights** and **on-the-ground sentiments** by them.