

“GEOLOKA”: Urban Heat Island Participatory Mapping Using Dynamic Web-GIS for Urban Strategic Planning (Study Case: Cirebon City, Indonesia)

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SUMMARY

Urban Heat Island (UHI) is a phenomenon of heat concentration in urban areas due to surface heat that is not evenly distributed to the surrounding rural areas. This phenomenon has become a global issue, including Indonesia, due to its threat to urban health. According to the Indonesian Meteorology, Climatology, and Geophysics Agency, atmosphere temperature in big cities has increased by 1 - 1.5°C in the last few decades. Since Cirebon City is a part of the developing Special Economic Zone “Segitiga Rebana”, the city will experience increasing population, energy use, and land use in the future, which potentially cause significant damage due to increasing UHI levels. This study aims to examine Cirebon City's current UHI level and to the future. UHI is analyzed by correlating data on Anthropogenic Heat, NDVI, NDBI, and night light from satellite data and observational data from local communities selected to participate. The data is then displayed in a dynamic WebGIS along with annual data and interactive features that allow the public to report real-time conditions. According to our observations with the prototype, the majority of Cirebon City has been affected by UHI. Therefore, the results of this innovation can be used as a starting point for UHI monitoring in urban planning strategies and urban temperature control, as well as input for future government environmental policies. This innovation is expected to contribute to compiling countermeasures for the negative effects of UHI by involving the role of the community.

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