

Anthropogenic Heat Intensity in Jakarta Metropolitan Area

L. Yola and G. A. Nanditho

Center for Spatial Data and Analysis, School of Strategic and Global Studies, Universitas Indonesia

Contact: <lin.yola@ui.ac.id> Web: <http://www.csda.sksg.ui.ac.id>

(1) Introduction: The significant temperature increase in the city center develops thermal distress and the cooling loads in the tropical region. The fast-economic activities and urban development creates the increase of the Urban Heat Island intensity that worsen the climate change (Oke, 1982; Leal Filho et al., 2002). The big cities like Jakarta struggles with this situation especially when it also contributes to the poor pollution index. There is a lacking of empiric studies on this issue, especially on the anthropogenic heat and emissivity intensity topic. As a variable contributing to the anthropogenic heat, this study presents the investigation on the emissivity intensity development in Jakarta metropolitan area. The issues of temperature increase and air pollution in the city center are the main challenge faced in Jakarta. The impacts on thermal comfort and cooling load are the consequences that moves Jakarta away from the sustainability targets (Yola and Siong, 2017; Yola, 2020). Therefore, this study presents a clear reference to the emissivity significant data of Jakarta.

(2) Method: This study was situated in Jakarta metropolitan area. As the focus of this study, a range of a decade emissivity data in two years; 2009 and 2019. A series of Landsat 5 and 8 (path 122 row 64 and 65) of 2009/07/29 and 2019/8/1 was analyzed. Particularly, the emissivity satellite imagery is presented. The percentage of the emissivity intensity is quantitatively presented to indicate the decade data gap. Part of this study is still on progress.

(3) Result: This study presents the emissivity data comparison through the satellite imagery and the intensity. Figure 1 shows the results of Anthropogenic Heat mapping in 2009 and 2019. The results show that the emissivity intensity developed from 53% to 62% in 10 years. This development pointed out that the significant increase of emissivity intensity (a decade gap of 9%) clearly contributes to the temperature increase in Jakarta city center. This fact contributes to the development of emissivity intensity, thermal stress

and the energy consumption in the city center. This finding recommends the policy makers to take commitment in national climate change mitigation agenda. For the case of Jakarta Metropolitan area, a comprehensive spatial planning policy is urged to prevent the bigger impact on the social and urban ecological environment. However, this study will need to further analyze its relation with other variables such as land use changes, green area, etc.

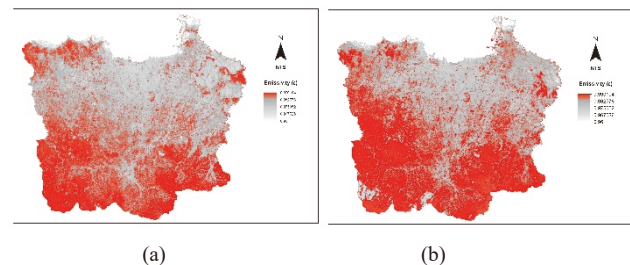


Figure1: Emissivity Intensity in 2009 (a) and in 2019 (b)

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