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COVER LETTER

Meassa Monikha Sari
Universitas Serang Raya
meassamonikha@unsera.ac.id
081 328 886 445

[*December, 12 2024*]

Dear,
We wish to submit an original research article entitled "***Land cover changes, built-up and vegetation density, and UHI phenomenon in Pekanbaru City***" for consideration by SINERGI.

We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere. We promise not to withdraw this article after it has been processed by the Editorial Team. If there is a withdrawal, we are willing to pay a penalty of USD 150 (IDR 2000K) to the SINERGI Editorial Team.

In this paper, I/we report on / show that:

Field	:	Civil Engineering
Topic	:	The impact of land use changes on ambient temperature, with an emphasis on the relationship between built-up areas, vegetation density, and the phenomenon of increasing temperatures in urban areas
Brief Background	:	The rapid conversion of land due to urbanization is having a notable effect on the environmental quality and temperature levels in Pekanbaru City. As urban development enhances residential, office, and industrial spaces at the expense of vegetation, the loss of green areas is intensifying, leading to significant ecological issues, such as increased CO2 emissions and a decline in biodiversity. With Pekanbaru's population expected to reach 1,123,000 by 2024, reflecting an annual growth rate of 2.99%, the ongoing urbanization contributes to further climatic deterioration — primarily due to the addition of impermeable surfaces. This alteration has sparked worries regarding the Urban Heat Island (UHI) effect, which raises air temperatures and pollution levels, thereby negatively impacting public health. Grasping the

		elbow of the UHI, which has been assessed through Land Surface Temperature (LST) evaluations, is crucial for developing sustainable urban development strategies. This research intends to analyze changes in land use concerning LST and provide recommendations for sustainable practices in future policy formulation.
Research Problem	:	During in five years (2018 – 2023), how land cover changes in Pekanbaru City, how the correlation of LST to NDBI and NDVI, then define the UHI phenomenon in Pekanbaru City.
Overview of Method	:	The data sources used in the study are the Pekanbaru City administrative shapefile map and Landsat 8 OLI/TIRS imageries. The 2018 image data was taken at the time of acquisition on January 30, 2018 with a cloud cover of 6.16, while for 2023, an image of May 20, 2023 with a cloud cover of 8.54 was used. Data analyzed is using QGIS and ArcGIS
Significant finding	:	This study concludes that in a span of 5 years (2018 – 2023), there has been a change in land cover in the city of Pekanbaru, where the area of water bodies increased by 23%, palm plantation increased by 5%, built-up land increased by 34% and vegetation increased by 10%, while the area of bare land decreased by 57%. In addition, there are significant changes in building density and vegetation. The correlation between LST and NDBI has a positive relationship; on the contrary, LST is negatively correlated with NDVI in Pekanbaru City. There was an Urban Heat Island (UHI) phenomenon in of Pekanbaru in 2018 and 2023, characterized by a more significant surface temperature than the value of the UHI threshold. Several strategies could be applied to get better city quality.

We have no conflicts of interest to disclose.

Thank you for your consideration of this manuscript.

Sincerely,

Meassa Monikha Sari

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AUTHORSHIP STATEMENT

We wish to submit an original research article entitled ***Land cover changes, built-up and vegetation density, and UHI phenomenon in Pekanbaru City***" for consideration by SINERGI.

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated sufficiently in work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or revision of the manuscript.

Author 1		
Name	:	Meassa Monikha Sari
Affiliation	:	Departement of Civil Engineering, Universitas Serang Raya; Doctoral Program of Natural Resources and Environmental Management Science, IPB University
Email Address	:	meassamonikha@unsera.ac.id
Author 2		
Name	:	Atri Prautama Dewi
Affiliation	:	Department of Architecture, Universitas Pancasila; Doctoral Program of Natural Resources and Environmental Management Science, IPB University
Email Address	:	atri@univpancasila.ac.id
Author 3		
Name	:	Valdya Hartati Lestari
Affiliation	:	Magister Program of Natural Resources and Environmental Management Science, IPB University
Email Address	:	valdyahartatilestari@gmail.com
Author 4		
Name	:	Sonya Okta Deviro
Affiliation	:	Magister Program of Natural Resources and Environmental Management Science, IPB University
Email Address	:	sonyaoktadeviro@apps.ipb.ac.id

POTENTIAL REVIEWERS

Please submit 3 (three) potential reviewers (*that have not listed in SINERGI*) to speed up the review process that competent for the topic and has a good reputation in that area.

Reviewer 1	:	
Name	:	Dr. Ir. Restu Faizah, S.T, M.T
Affiliation	:	Universitas Muhammadiyah Yogyakarta
Email Address	:	restu.faizah@umy.ac.id
Scopus url	:	https://www.scopus.com/authid/detail.uri?authorId=57203433674
Google Scholar url	:	https://scholar.google.co.id/citations?user=S6xqLNYAAAAJ&hl=id
Reviewer 2	:	
Name	:	Dr. Dino Rimantho, ST.,MT.,IPM.ASEAN Eng.
Affiliation	:	Universitas Pancasila
Email Address	:	dino.rimantho@univpancasila.ac.id
Scopus url	:	Rimantho, Dino - Author details - Scopus
Google Scholar url	:	https://scholar.google.com/citations?user=spXkkiIAAAAJ&hl=en&oi=ao
Reviewer 3	:	
Name	:	Achmad Fahruddin Rais
Affiliation	:	BRIN Limnology and Water Resources Research Center
Email Address	:	achm050@brin.go.id
Scopus url	:	https://www.scopus.com/authid/detail.uri?authorId=57195418433
Google Scholar url	:	https://scholar.google.com/citations?user=AqaEcxAAAAAJ&hl=en