Review of: "Object-Based Classification to Evaluate LULC Changes and Socio-Economic Mobility with Google Earth Engine: A Case Study of Rajarhat-New Town Agglomeration, Kolkata, India"

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Potential competing interests: No potential competing interests to declare.

Title: Object-based Classification to Evaluate LULC Changes and Socio-Economic Mobility with Google Earth Engine: A Case Study of Rajarhat-New Town Agglomeration, Kolkata, India.

Name of the Reviewer: **Prof. K.RaghuBabu**.

Abstract: The first line of the abstract is a bit confusing; it is mentioned as Calcutta Wetlands. Is it a technical name? Because in the title, the city is mentioned as Kolkata. The effects of LULC on the rapid growth of residential, commercial, and industrial developments were well related and defined in the abstract.

Key Words: Sufficient

1. Introduction:

The classification of land based on LULC was defined well. The categorisation of land based on its utilization is appropriate, and the analysis of the data in support of the references is done well. Further, the land degradation due to various factors like climate change, soil degradation, rapid urbanization, etc., is discussed well. The utilization of Object

1. Materials and Methods:

    1. Study area: The study area is well defined with the help of latitudes and longitudes. The location map is good; it would be better if it could have an index.
    2. Data: Appropriate
    3. Training and validation of sample datasets: The data utilized for analysis and the procedure adopted are appropriate and good.
    4. Methodology: The expression of methodology through a flowchart is good. Using the technique of Object Oriented classification in Google Earth Engine for the present study is fine. The application of machine learning-based multi-temporal remote sensing image processing to show the urban development is good.
    5. Dataset composition: The analysis using BSI, NDVI, NDWI to improve LULC classification was done well.
    6. Object-based classification for LULC changes: The Object Oriented method is used in Google Earth Engine for the

classification of LULC changes, which is good and done well.

2. Results and Discussion:

    1. Decadal changes in LULC: Decadal LULC changes were well analysed and tabulated. The line graphs drawn from the analysed data show a decrease in cropland and a slight expansion in villages. Cropland showed a steady increase up to 2001, and then a decrease was observed. A rapid increase of aquaculture is observed. A bar diagram was also prepared showing all these changes and was presented. Analysing all these through Remote Sensing and GIS studies is appreciated. The maps are clear and good with a self-explanatory index.
    2. Prediction of LULC: Based on the results obtained, a prediction for 2031 was done. It was an innovative idea and appreciated.
    3. Accuracy assessment of LULC classification: The accuracy assessment of LULC made using Producer Accuracy (PA), User's Accuracy (UA), Overall Accuracy (OA), and Kappa Coefficient (K) was done well, and thus the percentage range of LULC calculated from 1991 to 2001 is good. The predicted LULC map for 2031 using the previous data is fine and appreciated. The map prepared in support of the accuracy assessment is good and self-explanatory.

3. Urbanisation policy and its influence on LULC: This part of designing the LULC as part of town planning, which includes the development of the city from 1981 up to 2011, is appreciated.
4. Conclusions: The application of machine learning-based multi-temporal remote sensing image processing to show the urban development is good and appreciated.
5. References: Sufficient.