

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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This work presents a comprehensive study on land use land cover (LULC) changes and socio-economic mobility in Rajarhat-New Town, Kolkata, using Google Earth Engine (GEE) and object-based classification^[1]. The strengths of this study lie in its robust methodology, integrating Support Vector Machine (SVM) and Random Forest (RF) algorithms, and utilizing Principal Components Analysis (PCA) for the significant Grey-Level Co-occurrence Matrix (GLCM) indices. The use of GEE enhances the efficiency and scalability of the analysis, as has been seen in several recent works^{[2][3]}. Integrating additional environmental and climatic factors could further enrich the analysis, providing a more comprehensive view of urbanization's broader implications^{[4][5][6]}.

One area where the study could expand is in addressing the environmental impacts of LULC changes. Rapid urbanization, as observed in Rajarhat-New Town^[1], can significantly affect the region's water resources and ecological balance. Similar studies in semi-arid regions of Western India and Southern India have shown that urbanization can lead to increased surface runoff and reduced groundwater recharge, highlighting the importance of considering hydro-ecological impacts^{[7][8][9][10]}. Additionally, extreme climatic events, such as flooding or drought, are becoming more frequent and severe due to climate change, making it crucial to assess urbanization's impact on climate resilience^{[11][12][13]}. By incorporating these aspects, the study can provide a more holistic understanding of urban development's sustainability.

To enhance the study's contributions, it could benefit from integrating hydrological models to simulate the effects of urbanization on water resources, as demonstrated in the IIT Bombay campus study^[14]. Additionally, incorporating ground truthing and qualitative investigations on the field would provide more accurate and context-specific data, strengthening the reliability of the findings from secondary data analysis. Exploring traditional water management practices, such as tank cascade systems, can offer valuable insights into sustainable water management in urbanizing regions^{[15][16][17][18][19][20]}. These practices have been shown to mitigate the negative impacts of urbanization on water availability and quality, as seen in Southern India's semi-arid regions^{[21][22][23]}. Incorporating these elements, along with robust field investigations, can provide practical solutions for enhancing the region's environmental sustainability and resilience to climate change.

In conclusion, this study provides additional perspectives into LULC changes and socio-economic mobility in the Rajarhat-New Town agglomeration. By expanding the analysis to include hydro-ecological assessments, climate resilience strategies, and sustainable urban planning practices, the study can provide a more comprehensive understanding of the region's development. Future research should focus on integrating these elements to ensure the long-term sustainability of urbanization. By doing so, the study can significantly contribute to our understanding of sustainable urban development and its impacts on both the environment and society.

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