Urban Land-Use Change Detection Using Multi-Temporal Satellite Imageries: a Case Study of Isuikwuato Local Government Area in Abia State.

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SUMMARY

It is necessary to have information about LULC patterns change over time not only for urban planning purposes, but also for improving the management of the use of land resources. This study has demonstrated the importance of using Remote Sensing and GIS techniques to produce accurate LULC maps and change statistics in Isuikwuato Local Government Area over the last two decades, which is valuable to monitor urban expansion effectively over time. A supervised Maximum Likelihood classification algorithm was applied to the Landsat images of 2000, 2015, and 2022 because it allows decisions about change to be made at the pixel level which minimizes the error criterion in the classified image over a large number of individual pixel classifications, the images were classified into a built-up area, open land, vegetation, and water bodies. Then, the classified images were used to determine land use/cover change between 2000 and 2015, and also between 2015 and 2022. The built-up class represents an urbanized area that provided an indicator of urban expansion. The results of LULC change detection of the study area showed that built-up area covered 25.902 km2 in 2000, 33.326 km2 in 2015 and 126.873 km2 in 2022 or 5.93%, 7.63% and 29.06% of the study area respectively. This represents a net increase of 100.971km2 in 22 years, which is mainly attributed to the rapid increase in population. During the period of 2000 to 2022, there was a decrease in both the vegetation and open land, which were converted to urban areas due to population growth. However, urban expansion had increased during the same period, which was considered as a key indicator that urban planning strategy should be given more attention. The increase in the built-up area is an indication of the rapid growth of the population and this may remain a challenge unless an environmentally friendly policy on land use is implemented to harmonize the demand and diminish the impacts that arise from it. This study may be use as a useful benchmark, to foster better decisions and improve policies in land use within the framework of a sustainable land use planning system

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