

Trend Analysis of Remotely Sensed Greeneries and Green-House Gases Data for Enugu Metropolis

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SUMMARY

In pursuit of the Sustainable Development Goals (SDG) No 11 and Target 7, the development, maintenance and accessibility of greeneries for city residents is a priority towards building an environmentally friendly, inclusive and climatically resilient society. As a result of the increased need for urban shelter in Enugu metropolitan city, green-space within that environment has been substantially reduced over time. In a bid to restore an environmentally safe and friendly society, there is need to obtain data as regards the trend (past and current status) of open spaces/greeneries within the study area in relation to green-house gas emission, urban heat and population of the area. The green-house related gases as well as associated indices measured are carbon Monoxide, Nitro Dioxide, Sulphur Dioxide, Methane, thermal heat and population density of the study area. Remotely sensed data from LandSAT-8 and Sentinel 5P satellites were used to obtain multi-date and multi-season trend analysis of the data sets as well as population estimates of the study area. The LandSAT images were subjected to supervise image classification, band compositing and other spectral analysis in order to estimate the spatial and temporal changes in greeneries within the study area using the ENVI and ArcMAP software. Also, spectral analysis was carried out on the Sentinel imageries to estimate the spatio-temporal changes in green-house gases emission within the study area using the SNAP and ArcMAP software. Finally, spatio-temporal changes in population within the study area was estimated using Bayesian statistical analysis of the LandSAT imageries. Results obtained reveal the pattern of changes in the studied parameters a well as the spatio-temporal trend of interrelationship between the studied parameters. These results will serve as input data for local authorities in planning for the revitalization of greeneries and open spaces within the study area as a means towards ameliorating the effects of global warming within Enugu metropolis.

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