A SPATIAL TEMPORAL ANALYSIS OF WETLAND LOSSES IN THE LAGOS COASTAL REGION, SOUTHWESTERN NIGERIA, USING MULTI-DATE SATELLITE IMAGERY.

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Wetlands are delicate ecosystems that are important for a number of reasons including flood control, sediment retention, waste water filtration, and biodiversity conservation; and as sites for wildlife (fish, birds, and amphibians)breeding, recreation and tourism, and socio-cultural activities, etc. however, despite this array of functions performed by wetlands they are consistently threatened in most African countries due to economic, political and cultural reasons, not to mention hazards resulting from climate change and a host of other environmental threats such as oil spill, bush burning and coastal erosion. This paper assesses the temporal trend and the spatial patterns of wetland forest loss in the Lagos coastal region of southwestern Nigeria between 1976 and 2006 based on the comparative analysis of multi-date satellite imageries for 1976, 1986, 1995, 2000 and 2006. The 1976 and 1986 images are Landsat MSS; the 1995 image is Landsat TM; while the 2000 and 2006 images are Landsat ETM.

Using a supervised classification algorithm together with various image filtering methods, the initial number of wetland habitats was derived. A 200m x 200m grid was superimposed on the classified 2006 Landsat ETM image to verify the different habitats. The centroid of each 200m x 200m grid was visited to confirm the type of habitat. Ten percent of these centroids were randomly selected for each habitat and these were the sites visited for confirmation of wetland types. The result of the 2006 image interpretation was subsequently used to retroactively interpret the images for previous years for the same area.

The results of the comparative analysis of the multi-date images show that there are two dominant types of wetland habitats in the study area: freshwater swamp forests and mangrove swamp forests. The total area of wetlands declined by 19% from 399.54 km^2 to 323.47 km^2 between 1976 and 2006. Giving an annual rate of loss of 0.6% over the 30-year period. Freshwater swamp forests declined by 20.9% from 304.49 km^2 to 240.80 km^2, while mangroves declined by 13% from 95.05 km^2 to 82.67 km^2 over the same period. The lower rate of decline of mangrove forests compared with freshwater swamp forests is probably a reflection of the more waterlogged and difficult terrain. Over the 30-year period, the annual rate of loss of freshwater swamp forests was 0.7% while the rate for mangroves was 0.43%. The period between 2000 and 2006 witnessed the lowest decline. Out of the six Local Government Areas (LGAs) studied, Alimosho LGA recorded the highest rate of freshwater forest loss and this was followed by Amuwo Odofin LGA. The results show a correlation between political dispensations and rate of wetland loss. Using the Markov Chain technique, it was observed that the trend in wetland loss would likely continue if the current economic-cum-social and political system is maintained.

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