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Land Susceptibility to Soil Erosion in Orashi Catchment; Nnewi South, Anambra State, Nigeria

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Soil erosion is one of the most critical environmental hazards that causes land degradation and water quality challenges. Specifically, this phenomenon has been linked to river sedimentation, ground water pollution and flooding among others. In this paper, the susceptibility of Orashi River Basin (ORB) to soil erosion was assessed for the purpose of erosion control measures. Located in the south eastern part of Nigeria, the ORB which covers approximately 413.61 sq. km is currently experiencing one of the fastest population growth rate in the region. Soil erosion susceptibility analysis of the basin was based on four factors including; rainfall, Land use/Land cover change (LULC), slope and soil erodibility factor (k). The rainfall was assumed to be a constant and independent variable, slope and soil types were categorised into ten (10) classes each while the landuse was categorised into five classes. Weight was assigned to the classes based on degree of susceptibility to erosion. An overlay of the four variables in GIS environment was used to produce the basin susceptibility to soil erosion based on the weight index of each factors. The LULC analysis revealed that built up land use increased from 26.49 km2(6.4%) in year 1980 to 79.24 km2 (19.16%) in 2015 at an average growth rate of 1.51km2 per annum while the light forest decreased from 336.41 km2 (81.33%) in 1980 to 280.82km2 (67.89%) in 2015 at an average rate 1.59km2 per annum. The light forest was adjudged to have the highest land cover soil erosion susceptibility. The steepest slope ranges between 70o and 82o (14.34% of the total land area) and was adjudged to have the highest soil susceptibility to erosion. Total area covered of loamy soil is 112.37 km2 (27.07%) with erodibility of 0.7. In all, the overlay of all the variables revealed that 106.66 (25.70%) and 164.80 km2 (39.7%) of the basin have high and very high susceptibility to soil erosion. The over 50% high susceptibility of catchment has serious negative implications on the surface water in term of water quality and downstream siltation with great consequences on biodiversity and ecosystem services including domestic and industrial usage.