Meander Geometrical Characteristics of River Donga, Taraba State, Nigeria (Oral)

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Abstract

This study investigates the channel migration dynamics of the River Donga in Taraba State, Nigeria from 1988-2024. The Donga Basin covers 13,228 km² and exhibits a complex river system with diverse factors influencing channel migration, including sediment deposition, erosion, water flow alterations, geological formations, land use modifications, and climatic variations. The channel stretches to a length of 383.61 km. Employing an integrated approach involving Landsat satellite data for 1985, 2000, 2013 and 2020, as well as fieldwork, the research focuses on meander geometrical parameters and their correlation with water stage variations at different river reaches. Results revealed a spatial distribution of meanders with hot spots located at the upper reaches, a river form while, not impossible but highly unlikely to develop at that phase. Over the years, the number of meanders particularly in the upper course showed significant decrease. Correlating meander geometrical characteristics and water stage measurements indicates the river constantly shifts to achieve a new state of equilibrium, with significant trends across the study period. The observed changes depict notable channel migration and cutoffs development, shaping the river planar form. Vegetation cover around the river channel increases the cohesion of bank materials through the rotting system, making the substrate cohesive and consolidated body thus, regulating the meanders from migrating. Adjoining the riparian zones are widespread agricultural fields and built-up areas that further increase human impact on the channel. These findings contribute to a deeper understanding of the River Donga dynamics, underscoring the imperative for continuous monitoring and analysis.

Keywords: Channel Migration, Geomorphological Changes, Meander Dynamics, River Donga, Water Stage Correlation