Quantifying the Impacts of Climate Variability and Land Use Changes on the Hydrological Response of the Niger Delta

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**Background**

- Increased flood frequency and magnitude in the Niger Delta
- Debate on the causative factor of flooding

**Objectives**

- Detection and assessment of rainfall trend
- Land use change detection
- Hydrological analysis

**Materials and Methods**

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<th>Rainfall Characteristics</th>
<th>Linear regression</th>
<th>LOWESS smoothing line</th>
<th>Mann–Kendall tests</th>
<th>Sen’s slope</th>
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<td>Land Use Change</td>
<td>Landsat Images</td>
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<td>Hydrological Analysis</td>
<td>SWAT (Soil and Water Assessment Tool)</td>
<td>Digital Elevation Map</td>
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<td>Flow direction Map</td>
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**Preliminary Results**

- Location: 4° 44 N and 6° 45 E
- Annual rainfall: 1500-2500 mm
- Climate: Equatorial
- Basin area and size: 1,393 km²
- Population: 600,000 (2010)

**Going forward**

The study will help understand and establish the contribution of land use/cover and rainfall to hydrologic extremes in the area using the SWAT tool.