

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

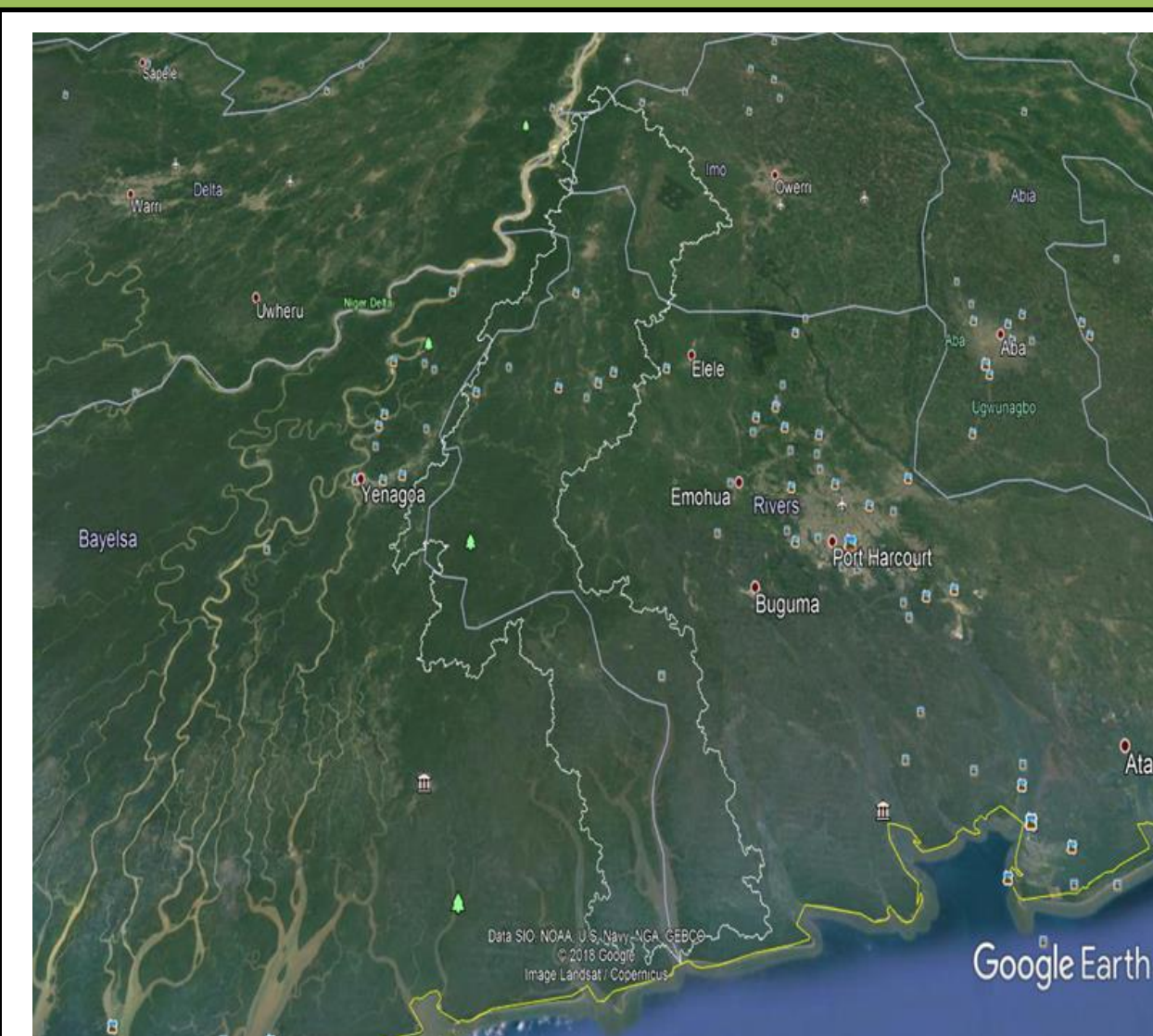
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## Background

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



- Location: 4° 44 N and 6° 45 E
- Annual rainfall: 1500-2500 mm
- Climate: Equatorial
- Basin area and size: 1,393 km<sup>2</sup>
- Population: 600,000 (2010)

## Objectives

- Detection and assessment of rainfall trend
- Land use Change detection
- Hydrological Analysis

## Materials and Methods

Rainfall Characteristics

- Linear regression
- LOWESS smoothing line
- Mann-Kendall tests
- Sen's slope

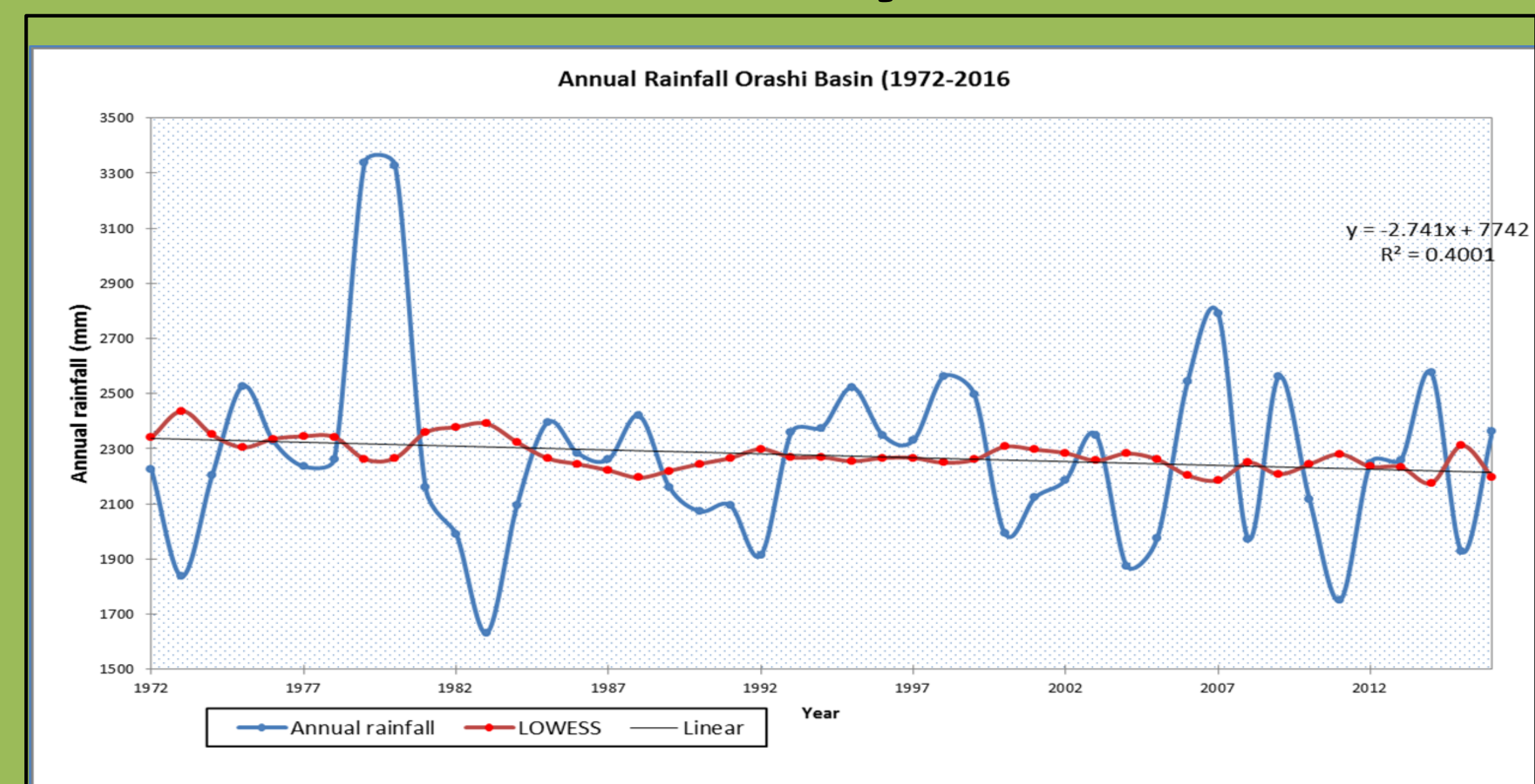
Land Use Change

- Landsat Images

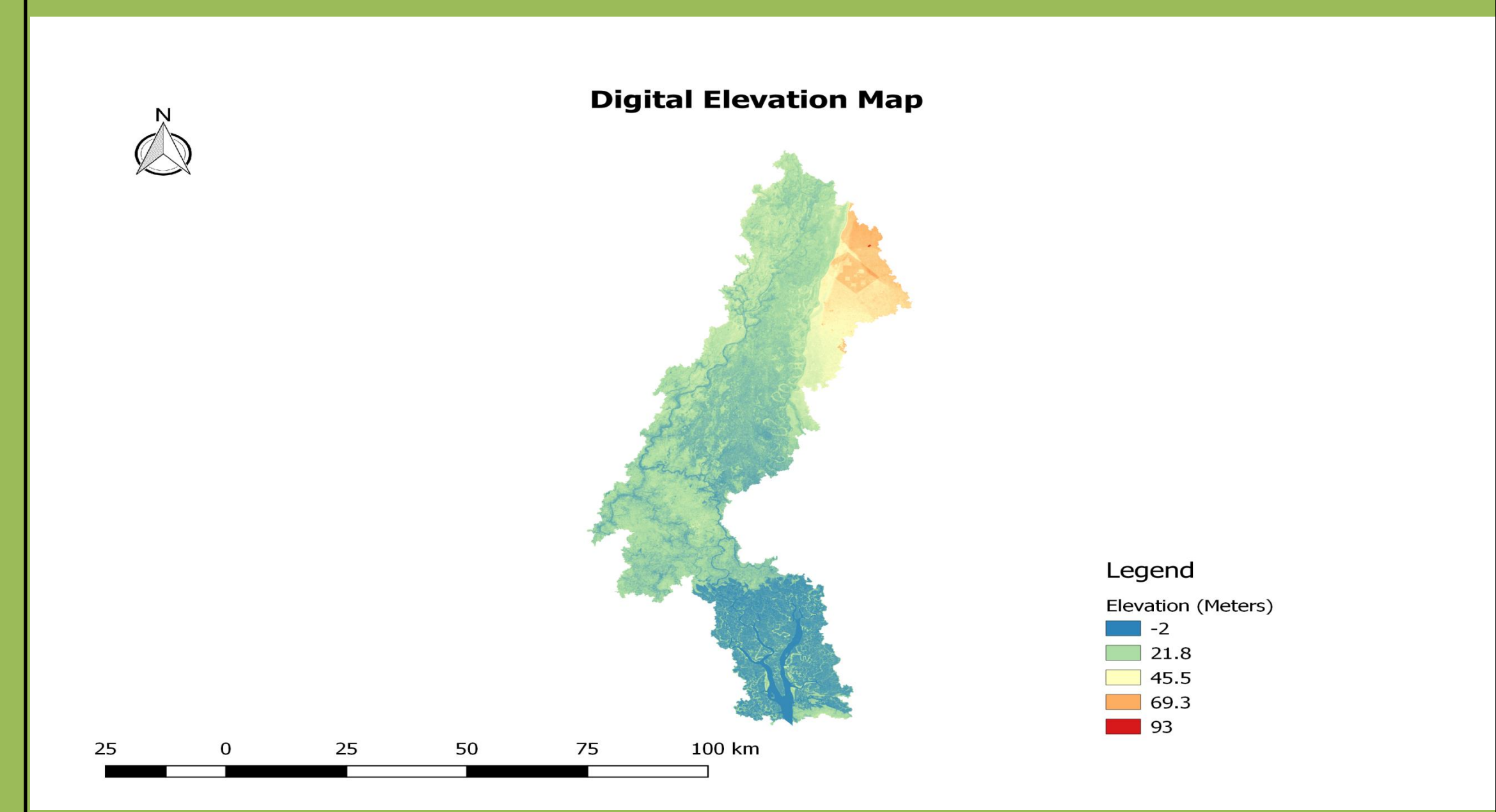
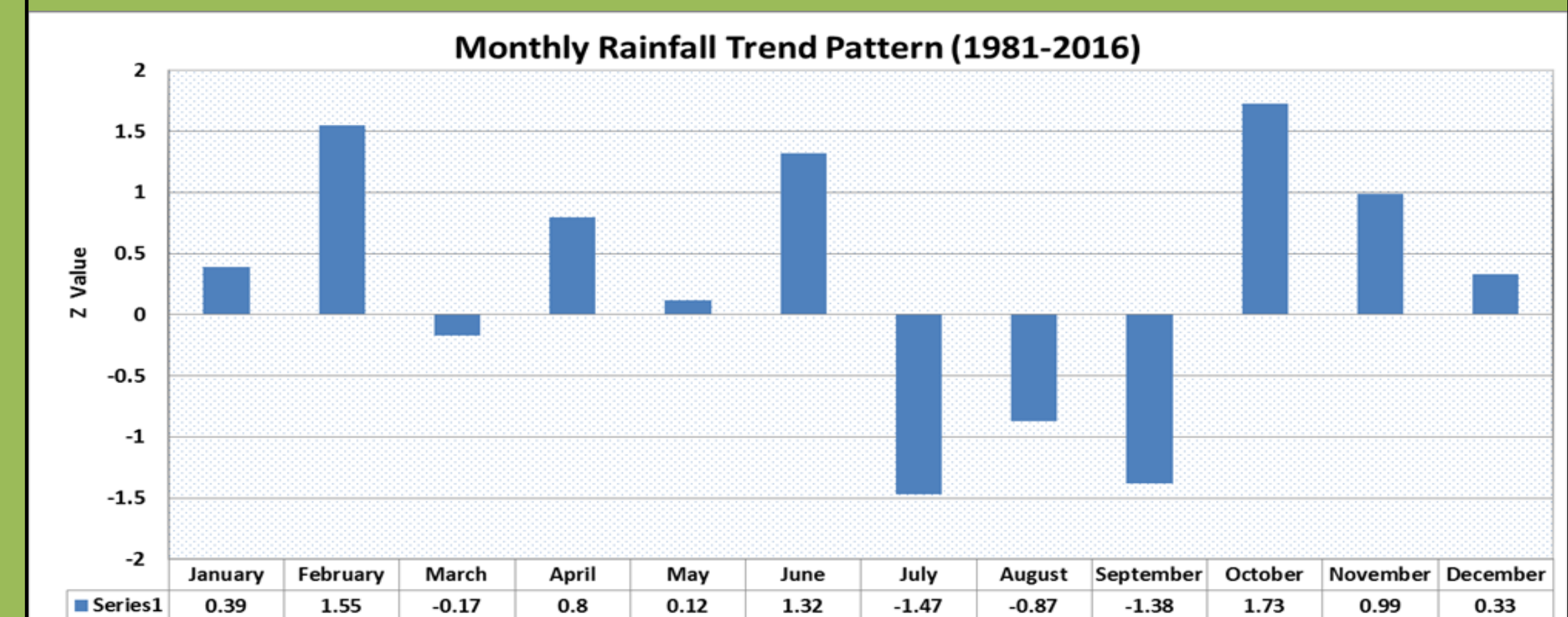
Hydrological Analysis

- SWAT (Soil and Water Assessment Tool)
  - Digital Elevation Map
  - Slope map
  - Flow direction Map
  - Flow accumulation
  - Soil Map

## Preliminary Results



Significance level ( $\alpha$ )	Critical values	Mann Kendall Test statistic (Z)	Trend	Significance
0.05	1.96	0.91	Increasing	Not significant



## Going forward>

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