PREFACE:

The quality of soils significantly impacts human societies and terrestrial ecosystems. Soil erosion poses a critical challenge that requires effective management strategies to conserve ecosystems. Traditional soil erosion prediction methods are accurate but impractical for large areas due to high costs. For more efficient and cost-effective large-scale soil erosion forecasts, scientists have recently relied on satellite remote sensing and predictive models like RUSLE. This research utilises RUSLE within Google Earth Engine to examine soil erosion trends in the Dwarakeshwar-Rupnarayan River Basin ***(Papaiordanidis et al.,2019)***

This study examined soil erosion in the Dwarakeshwar-Rupnarayan River Basin utilising a state-of-the-art geospatial technique that was implemented using the Google Earth Engine (GEE) platform. Incorporating the Revised Universal Soil Loss Equation (RUSLE) into the study demonstrated the model's utility on multiple analytical levels, each serving a distinct purpose. To start, we estimated the R factor using annual precipitation data from CHIRPS (Climate Hazards Group Infra-Red Precipitation with Station). After this, the soil's erodibility, denoted as the K factor, was ascertained by referring to the Open Land Map with USDA soil texture categories. In the third section, we simplified the LS component whereby DEMs were incorporated to indicate and measure the influence of slope data on erosional rates of the soil. The fourth aim, C, examined the contributions of the vegetation on the ability of the soil conservation by changing the Land Use and Land Cover map beside the NDVI data derived from the satellite Landsat-8 data obtained from the USGS. It was expected to be analysed by using MODIS data which was intended for such purpose and concerned different kinds of slope and land cover. These above layers were then used to rank the various sources of soil lost as well as to incorporate the known sources into the RUSLE model to obtain a map of the soil loss. ***(Sud et al. ,2024)***

It thus minimized some of the challenges scientist encounter while working with data, which are the availability of data, challenges of accessing data the size of the work done in trying to process the various naytures of data. ***(Papaiordanidis et al.,2019)***

1. INTRODUCTION:

Since ecosystems are much more than just soils, they significantly determine availability of requisite ecosystem services which makes soils essential parts of the earth system.