

# A STUDY ON THE RAINFALL CHANGES OF ERODE DISTRICT BY USING GIS

A.KRISHNAVENI<sup>1\*</sup>, P.KALAIVANI<sup>2\*</sup>

<sup>1</sup>Professor, Department of Civil Engineering, University College of Engineering (BIT CAMPUS), Trichy, India

<sup>2</sup> PG Student , Environmental Engineering, University College of Engineering (BIT CAMPUS), Trichy, India.

[venisenthil@gmail.com](mailto:venisenthil@gmail.com)<sup>1</sup>, [mahivaan56@gmail.com](mailto:mahivaan56@gmail.com)<sup>2</sup>

## Abstract

Changing atmosphere is extraordinary reason for worry for everywhere throughout the world particularly downpour took care of creating nation since change in sum and force of precipitation antagonistically influences all divisions of nation. Endeavor was made to examine variety in yearly, occasional and yearly precipitation over Handed of dissolve area during period from 2008 to 2018. Yearly precipitation patterns demonstrated immaterial falling patterns. Winter and summer precipitation patterns shows diminishing precipitation patterns. pre Monsoon and post rainstorm precipitation patterns shows expanding patterns .greatest expanding pattern were watched for post storm and it was 9.81mm/year. Examination of month to month patterns uncovers that month to month precipitation of a half year shows expanding patterns and a half year shows diminishing patterns.

**Key words:** climate change, rainfall, GIS

## 1. INTRODUCTION

Water is major for every single living thing and is used in different courses, for example, food creation, drinking, residential, mechanical power creation and recreational use. Out of 2.5% overall new water just 1% is available for human use. According to the world water report .the land openness level contracting is expanded step by step .the per capita land availability is in lessening design and is evaluated that simply 0.1hectare per capita land will be open before the

completion of 2025. Rabid increment in populace urbanization rural development and industrialization prompts more significant level of human demand. it has gotten increasingly basic in places where precipitation is low and flighty .despite the fact that India is honored with a higher normal yearly precipitation of 1,170 mm when contrasted with the worldwide normal of 800 mm .It faces the issue of water shortage in most piece of the year ground water level arrangements with parts of adjusting different segments of ground water

gracefully and removal with capacity changes in the ground water supplies. The territory of Tamilnadu stretches out around 130060 square kilo meter of southeast piece of India. Tamilnadu gets precipitation in the winter season because of upper east exchange winds. The ordinary yearly downpour fall of the state is 945 mm of which 48% is through the north east rainstorm, and 32% through the south west storm. Characteristic starting point of numerous waterways in Tamilnadu is from different states. All the water sources are always depends on the rainwater, but we are not understand the importance of rainwater.

### 1.1 RUNOFF

Runoff is the part of the precipitation, snow melt, or irrigation water that appears in uncontrolled surface streams, rivers, drains, or sewers. When rainfall starts, the first drop of water are intercepted by the leaves and stems of the vegetation. This is usually called as interception storage. As the rain continues, water arrives at the ground surface infiltrates into the soil until it reaches a stage where the rate of rainfall exceeds the infiltration capacity of the soil. Thereafter, surface puddles, ditches, and other depressions are filled. After which runoff is produced. The infiltration capacity of the soil relies in its texture and structure, as well as on the antecedent soil moisture content. The initial capacity is high but, as the rain continues, it decreases until it reaches a steady value referred as final infiltration rate. The process of runoff generation continues as long as the rainfall intensity over-reach the actual infiltration capacity of the soil but it stops as soon as the rate of rainfall drops below the actual rate of infiltration.

### 1.2 OBJECTIVE

- To determine the rainfall changes
- To estimate the runoff depth

### 1.3 STUDY ZONE

Disintegrate area is the western most Kongu Nadu locale of the province of Tamilnadu, India. In 2009, It is the biggest region by zone in Tamilnadu, covering more than 8000 square kilometers. Starting at 2011, the region had a populace of 2,251,744. Directions 11°21'N 77°44'E. Complete region of dissolve covers 8161km<sup>2</sup>. Proficiency in dissolve 72.96%. Disintegrate is a city and seventh biggest urban agglomeration in Tamilnadu, India. It fills in as the managerial base camp of the disintegrate area. Regulated by a civil partnership since 2009, Erode is a piece of the Erode Lok Sabah body electorate that chooses its individual from parliament. Situated on the banks of River Kaveri. It is arranged midway on south Indian landmass, around 400 kilometers southwest of its state capital Chennai and around 80 kilometers east of Coimbatore and around 50 kilometers east of Tiruppur. Disintegrate is an agribusiness, material and a BPO center point and among the biggest makers of turmeric, hand – loom and knitwear and food products. Erode has a bumpy landscape with undulating geography as the Urugumalai, Athimalai, Chennimalai slopes encompassed the city. The Amaravathy, Noyyal, Bhavani, and Kaveri streams stream into the city. While no prominent mineral assets are accessible, soil rock and limestone are found in plenitude in the stream. The locale having a place with present-day Erode District was governed progressively by a few South Indian administrations, including the Cheras, Cholas and Pandyas.



Figure1: Study area

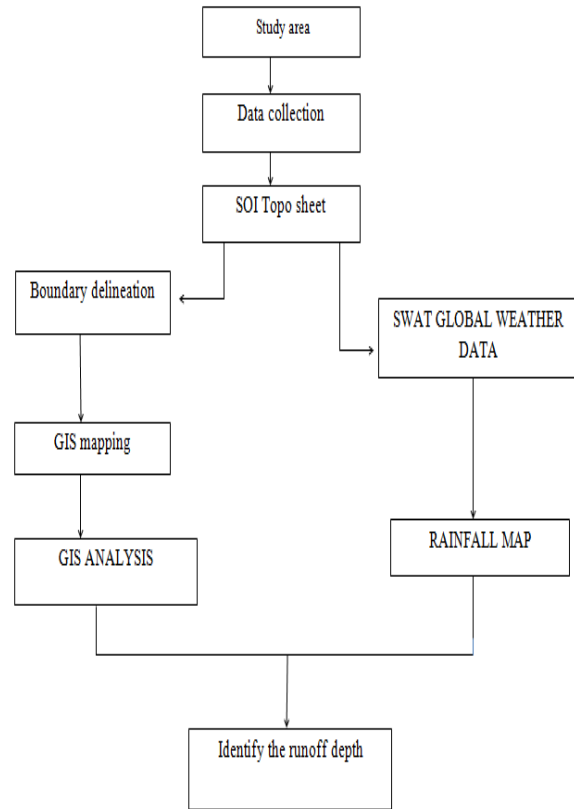


Figure2: METHODOLOGY

## 2. METHODOLOGY

The main aim of the study area to understand the rainfall changes in the study area. first of all Choosing the study area and the area select for this study is erode district .then the data needed to do the project or identified and collected the data used for the project or Survey Of India Top sheets .The rainfall data from SWAT global weather data with the help of base map, rainfall map is created using the software ARCGIS 10.5

## 3. RAINFALL CHARACTERISTICS IN THE DISTRICT

The precipitation information of the dissolve locale for as long as 10 years from 2007 to 2016 was acquired from SWAT model. After that the normal yearly precipitation esteem was processed and plotted a chart between the year and normal precipitation comparing to the downpour check stations. It gets the downpour affected by both southwest and upper east rainstorm. The upper east storm primarily adds to the precipitation in the taluk. The southwest storm is additionally sensible. Throughout the winter and hot seasons, the precipitation is inadequate. The ordinary yearly precipitation changes from around 575 mm to around 704 mm. The ordinary yearly precipitation over the region changes from

around 575 mm to around 833 mm. It is the base in the southern and southeastern pieces of the area around Kodumudi (575.3 mm) Mulanur (581.0 mm) and Dharapuram (593.0 mm. It continuously increments towards north and northwest and arrives at a most extreme around Thalavadi (833 mm). The western piece of the Erode region appreciates a salubrious atmosphere on account of the uneven locale, while the focal and eastern pieces of the region are hot and sticky. The cooler and lovely atmosphere wins in the sloping locales. The climate is incredibly wonderful during the period from November to February both in the fields and on the slopes. Morning by and large is stickier than the evenings.

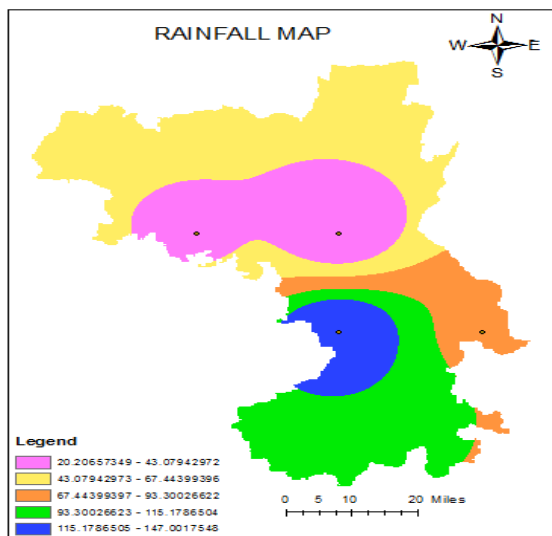


Figure3: rainfall map

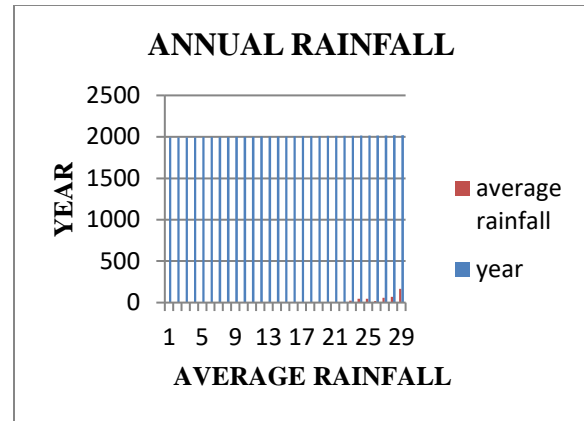


Figure4: AVERAGE RAINFALL

#### 4. CONCLUSION

The aim of present study was to identify rainfall changes for the period of (2008-2018). Annual rainfall changes showed insignificant falling trends. Annual rainfall trends of first half year (2008-2013) shows decreasing trends of about 24.57 mm/y, while second half (2013-2018) increasing trends of about 147.02mm/y. precipitation, rainfall intensity, rainfall duration, topography levels are main factors of rainfall changes and decreasing runoff depth. Pre and post monsoon rainfall levels also affected the mentioned rainfall factors. Accruing this type of rainfall affect the groundwater level, so earthquake will be occurred easily.

#### 5. REFERENCE LIST

- 1) Adger WN, Hug S, Brown K, Conway D, Hulme M (2003). Adaptation to climate change developing world. Proc. Dev. Stud., **3(3): 179-195**.
- 2) Akinremi, O.O., McGinn, S.M., Cut forth, H.W., 2001. Seasonal and spatial patterns of rainfall trends don

- the Canadian prairies. *Journal of Climate* **14 (9)**, 2177– 2182.
- 3) Anser Khan, Soumendu Chatterjee, Dipak Bisai and Nilay Kanti Barman (2014) Analysis of change point in surface temperature time series using cumulative sum chart and bootstrapping for Alanson weather observation station, west Bengal, *India American journal on climate change* **Vol. 3 pp. 83-94**.
  - 4) Dr.AvinashKadam, Kailas Karnewar (2016), Analysis of monthly and seasonal temperature trends of Nanded., July 2016., *Indian stream research journal* **vol.6 no.6 pp ;1-9** . Available online at [isrj.in](http://isrj.in)
  - 5) Frich P, Alexander LV, Della-Marta P, Gleason B, Haylock M, Klein Tank AMG, Peterson T (2002). Observed coherent changes in climatic extremes during the second half of twentieth century. *Clime. Res.*, **19: 193-212**. *International Journal of Research Available at* <https://edupediapublications.org/journals> **eISSN: 2348-6848 p-ISSN: 2348-795X** Volume 05 Issue 16 June 2018 Available online: <https://edupediapublications.org/journals/index.php/IJR/> Page | 580
  - 6) Guhathakurta, P., Rajeevan, M., 2007. Trends in the rainfall pattern over India. *International Journal of Climatology* **28 (11)**1453–1469.
  - 7) Intergovernmental panel on climate change (2007) the physical science basis: in contribution of working group 1 to the fourth assessment report of the Intergovernmental panel on climate change (Eds) *Soloma*. **18**.
  - 8) Jagannathan, P., Bhalme, H.N., 1973. Changes in pattern of distribution of southwest monsoon rainfall over India associated with sunspots. *Monthly Weather Review* **101, 691–700**.
  - 9) Jagannathan, P., Parthasarathy, B., 1973. Trends and periodicities of rainfall over India. *Monthly Weather Review* **101, pp. 371–375**.
  - 10) Jayewardene HKWI, Sonnadara DUJ, Jayewardene DR (2005). Trends of Rainfall in Sri Lanka over the Last Century. *Sri Lankan J. Phys.*, **6: 7-17**
  - 11) Karnewar Kailas and Avinash Kadam (2015) “a” Study of Temperature Trends of Nanded, Maharashtra, India. *World Rural Observe*; **7(2):30-35**.
  - 12) Karnewar Kailas and Avinash Kadam (2016) “b” Trends of monthly and seasonal temperature of Nanded, *International Journal of Research in Social Sciences*; **6 (9):90-102**.