MFE-2 Project Work

Analysis of Rainfall in Coastal Andhra Region

Akaash Gupta - 220332
Karthik Singidi - 220353
Akshay Korrapati - 220583
Aryan Rongali - 220340

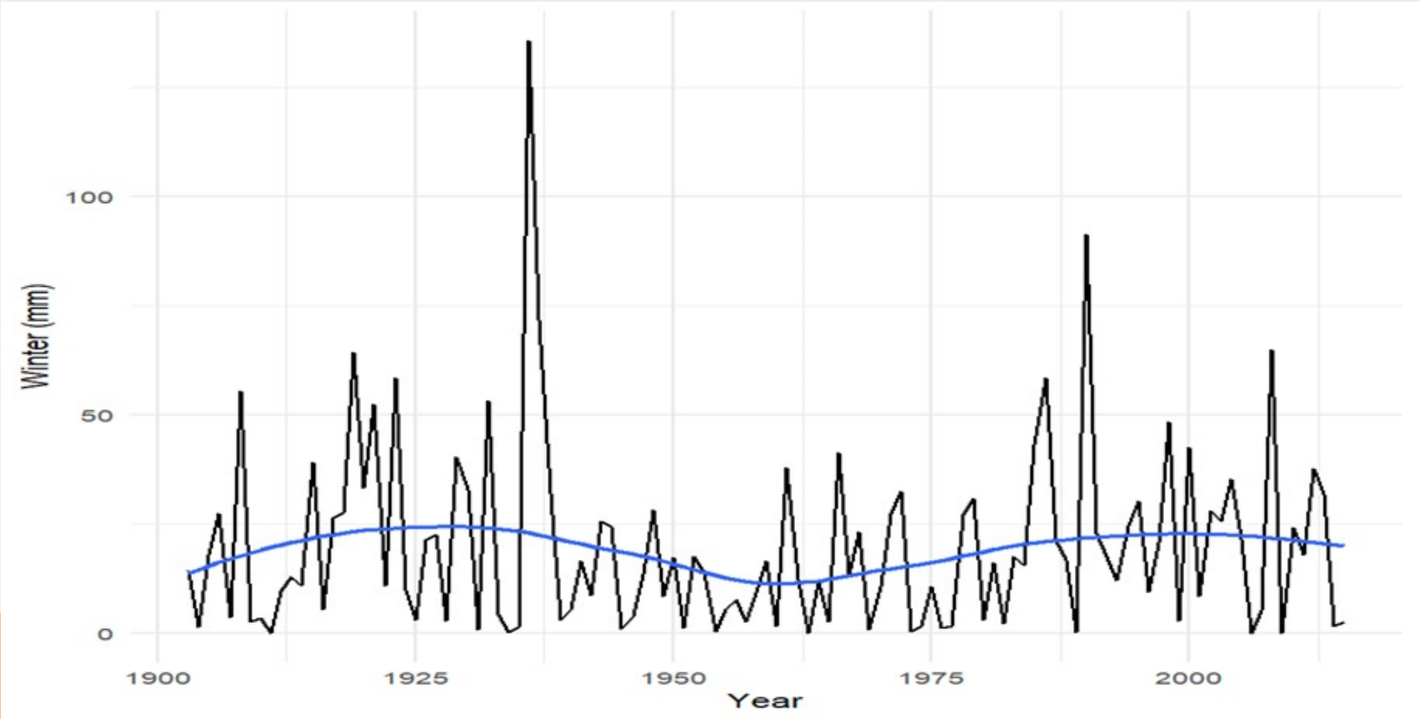
Introduction

Intro - Rainfall patterns and trends in Coastal Andhra region, India, are crucial for understanding its vulnerability to climate change and developing mitigation strategies. This report analyzes rainfall from 1915 to 2015, identifies trends, and highlights years with significant impacts on India. Data from the India Meteorological Department and existing literature are used. The analysis can inform water resource management, disaster preparedness, and socio-economic development strategies.

Rainfall Analysis

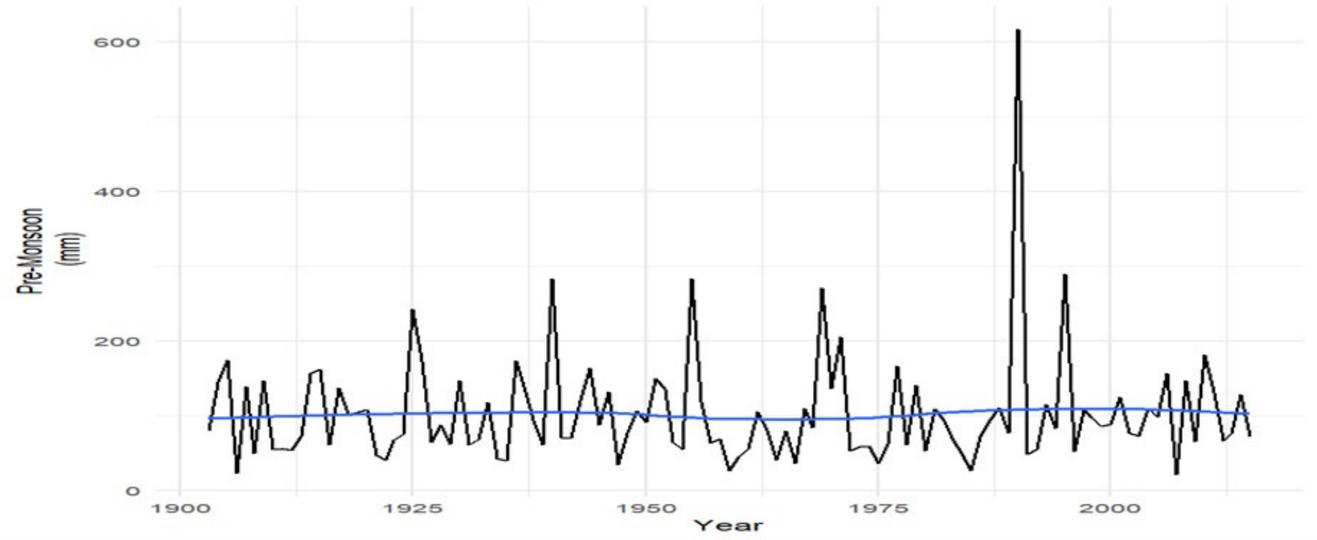
Rainfall Analysis - We used different visualization and data tools from R language to make a few graphs to analyze the rainfall and trends of rainfall in the different seasons of the Coastal Andhra region. This region has highly fertile soil and the main occupation is cultivation. Hence rainfall plays a huge role.

Rainfall in winter



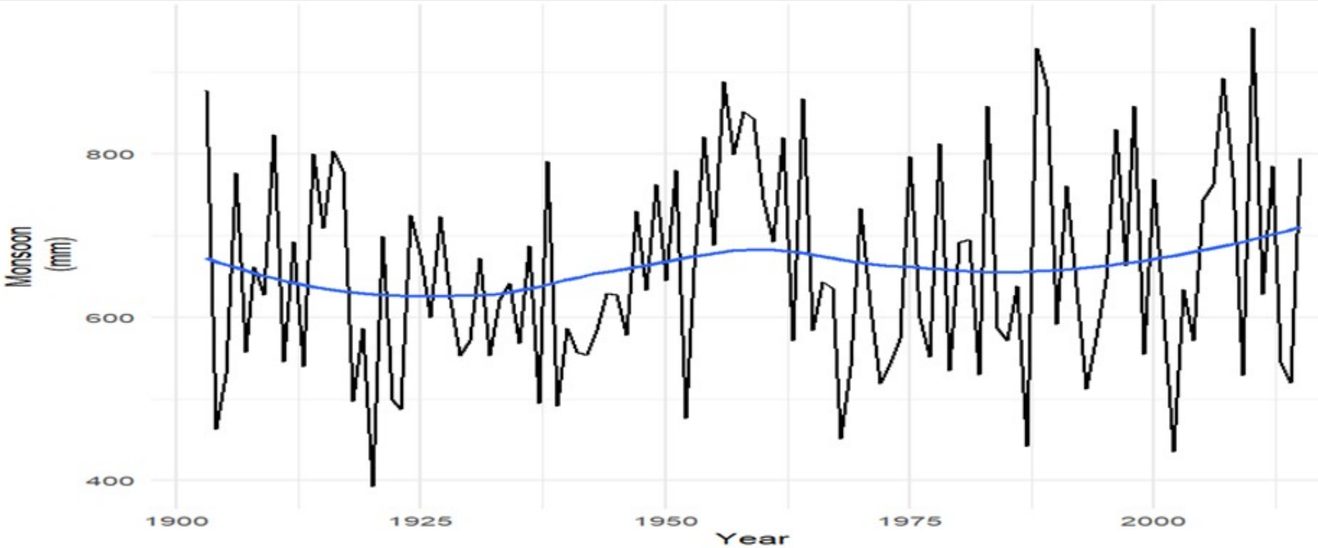
Months - Jan and Feb
Average rainfall - 22.4 mm
Agricultural Activities - Land preparation and sowing of rabi crops
Reason for rainfall - Low pressure western disturbances from Mediterranean sea

Rainfall in Pre-Monsoon



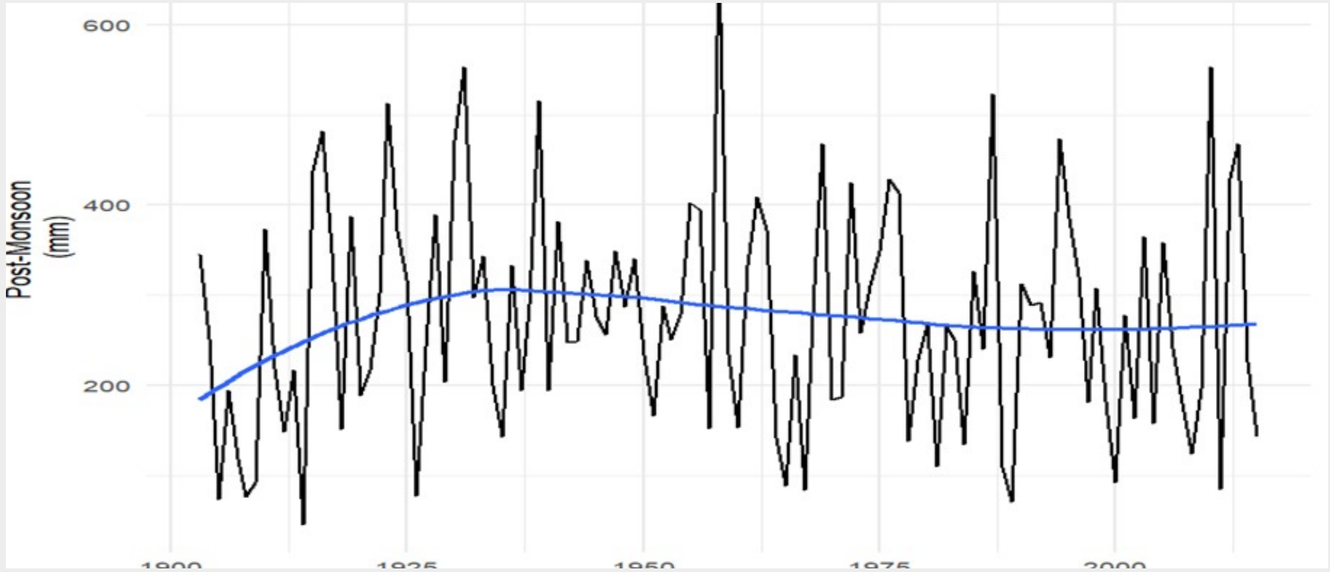
Months -March to May
Average rainfall - 94.7 mm
Agricultural Activities - Harvesting of Rabi crops
Sowing and weeding of Kharif crops
Reason for rainfall - Western trough which brings moisture from the Arabian sea

Rainfall in Monsoon



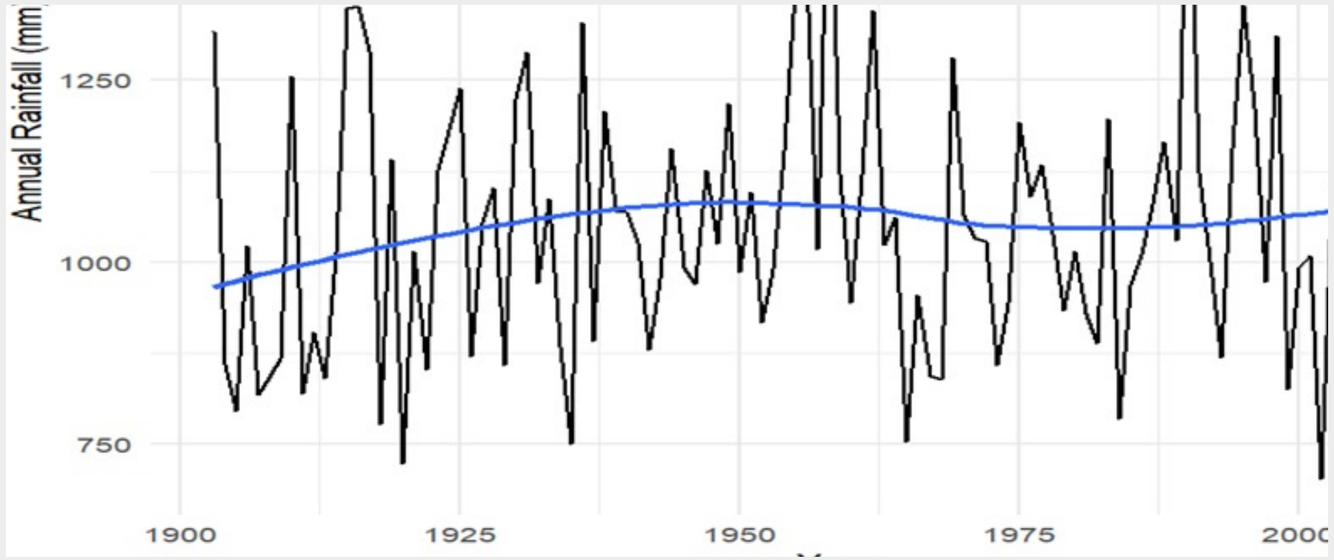
Months -June to September
Average rainfall - 627.9 mm
Agricultural Activities - Cultivation of Kharif crops including all the types of process
Reason for rainfall - South-west monsoon winds from bay of bengal.

Rainfall in Post-Monsoon



Months -October to December
Average rainfall - 208.6 mm
Agricultural Activities -Sowing and preparation for Rabi crops for next season
Reason for rainfall - South-west monsoon winds from the bay of Bengal but relatively less.

Annual Rainfall

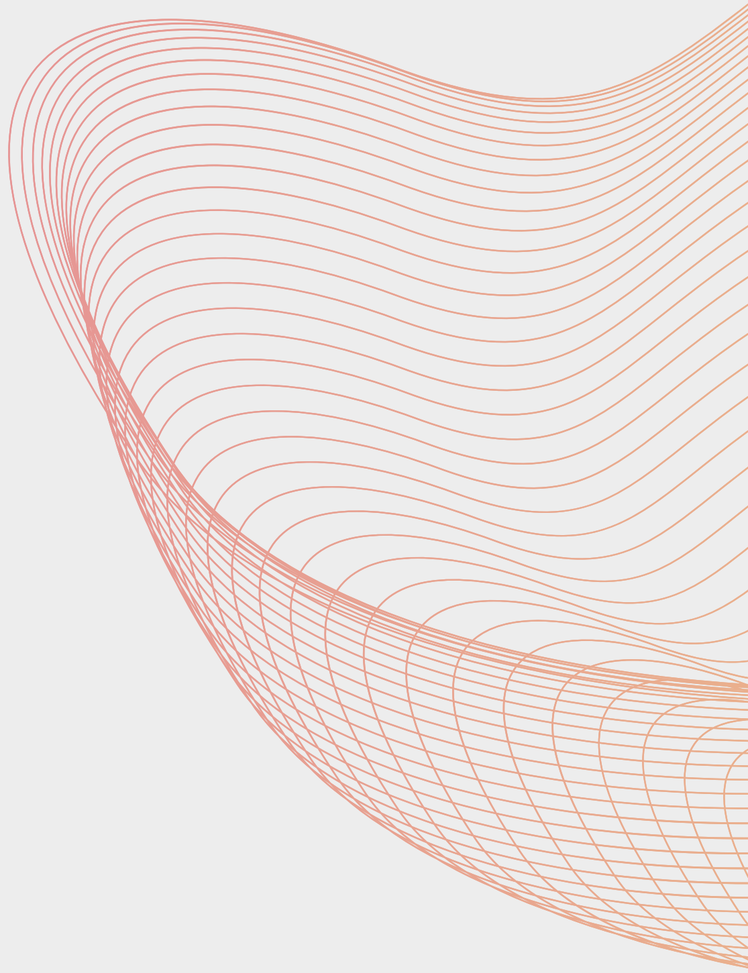


Annual Rainfall-We can say that the overall annual rainfall of coastal andhra region had many visible ups and downs and change in rainfall in this region is not constant. From this graph we have selected few recent years (1983, 1996, 2004, and 2009) to do a case study of rainfall during these years.

Case study on impact of extreme rainfall

Rainfall in 1983

- Coastal Andhra region received 25% less rainfall than normal during the 1983 monsoon season.
- Decrease in rainfall led to a significant decrease in agricultural production, contributing to a nationwide food shortage.
- Drought had a severe impact on the credit system of the region, with the agricultural sector being the most affected.
- Decrease in rainfall led to a decrease in the availability of water for irrigation, leading to a decrease in the area under cultivation



Case study on impact of extreme rainfall

Rainfall in 1996

- The Coastal Andhra region received heavy rainfall during the 1996 monsoon season with some districts receiving over 30% more rainfall than normal.
- The heavy rainfall led to floods in the region, which affected several other parts of India, leading to loss of life and property.
- The floods had a significant impact on the fishing industry and led to a decrease in tourism in the affected areas.
- The floods highlighted the need for better disaster preparedness and response mechanisms in the Coastal Andhra region, leading to the construction of new embankments, drainage systems, and early warning systems.

Case study on impact of extreme rainfall

Rainfall in 2004

- Heavy rainfall during the 2004 monsoon season caused devastating floods in the Coastal Andhra Region, leading to extensive damage to infrastructure, agriculture, and people's lives.
- The floods affected several districts in the region, with over 4 million people affected and more than 300 deaths in Andhra Pradesh alone.
- The floods caused damage worth over $1.3 billion USD to the agricultural sector in Andhra Pradesh, as well as significant impacts on the fishing industry.
- The floods also affected several other states in India, with 10 million people affected and Over 1000 Deaths in other states including Maharashtra, Karnataka and Gujarat.

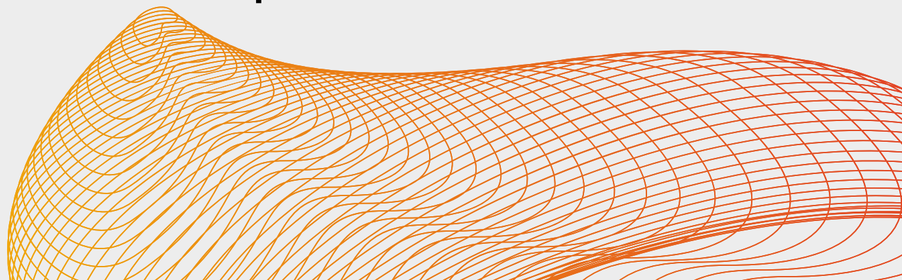
Case study on impact of extreme rainfall

Rainfall in 2009

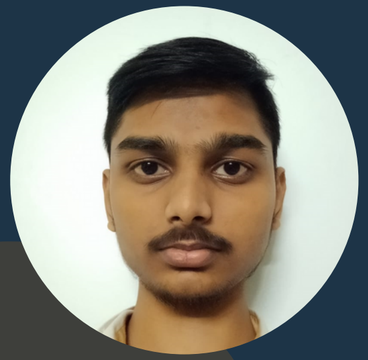
- Coastal Andhra Region experienced a 42% rainfall deficit in 2009.
- Over 1.4 million hectares of agricultural land in Andhra Pradesh were affected, causing a loss of over 10 million tons of food grains and a decline of 40% in crop production.
- The drought led to a decline in rural employment, income, and consumption levels, leading to increased poverty and food insecurity.
- The drought affected over 330 million people in India, with over 114,000 villages being affected, causing a decline in agricultural production, increased food prices, and a decline in rural employment.

Conclusion

The report analyzes rainfall patterns in Coastal Andhra from 1915 to 2015, highlighting the region's vulnerability to climate change. It provides information on annual rainfall, identifies causes for changes, and shows impacts on food security, water resources, and socio-economic development. The findings emphasize the need for effective water resource management and disaster preparedness strategies. The study contributes to understanding broader climate patterns in India and the impacts of climate change on socio-economic development.



Akaash



Akshay

Karthik

Aryan

Thank You