

# A Geographical Study of Rainfall Variability in Nandurbar District

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**Abstract:** *The present research paper attempts to analyse rainfall pattern and classification in Nandurbar district. Major rainfall in Nandurbar district receives from south-west monsoon which advects in the month of June and keeps up to the month of September. The region falls under assured rainfall zone. Approximately 70% area in the district receives 704.7 mm to 1280 mm rain. The average rainfall in the district is 801 mm per annum. Akkalkuwa and Navapur tehsils are situated on the windward valley between the Satpura and Sahyadri ranges. They receive highest rainfall in the district while Shahada receives lesser average of rainfall which is 644.93. The rainfall in the eastern part of the district is minimum and increases in the westwards.*

**Keywords:** Variability, intensity, decade, coefficient of variation, Standard deviation.

## 1. Introduction

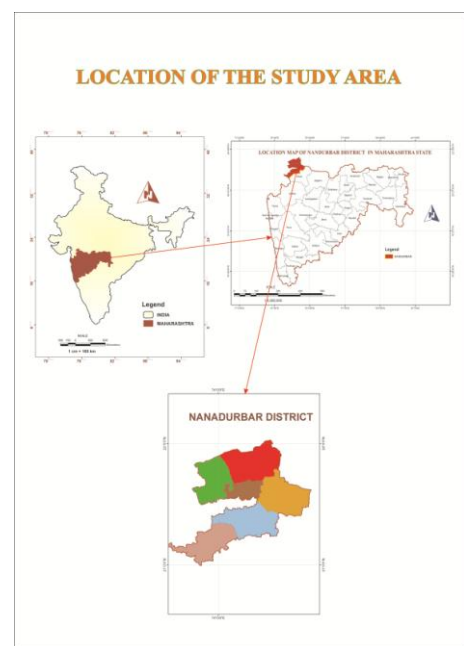
The intensity of agricultural operations, the intensity of cropping, intensity of irrigation, cropping pattern and productivity all are related to variability of rainfall. Variability of rainfall increases with decreasing mean annual rainfall. Variability in excess of 20 % implies great risk to farming (Williamson 1925) therefore, in the absence of irrigation or dry farming practices, agriculture is reduced to a gamble and consequent famines can be expected any time hence, In this situation, it is essential to provide additional water supplies for successful cropping. Rainfall variability is measured by the co-efficient of variability of average rainfall of 10 years.

The variation in rainfall has greater impact on agriculture subsequently on economic and social life of human beings. Hence it is highly important to study rainfall in the most tribal district in Maharashtra i.e. Nandurbar. The necessity of irrigation is determined by the amount of rainfall received during the period when the crops do need it to survive. The success of the crops depends on the rainfall during monsoon. The climate of the district is characterised by hot summer and general dryness throughout the year except during the south-west monsoon season i.e. June to September. Hence in order to increase agricultural production the effective utilization of water resources is essential. The unevenness and uncertainty are the characteristics of rainfall in Nandurbar. It is because of synoptic conditions, movement of the monsoon and relict variation largely.

In Nandurbar district the average of rainfall is 801 mm. The rainfall in the eastern part of the district is minimum and Shahada comes under this category. The rainfall increase in the westwards of the district. Akkalkuwa and Navapur comes under the major rainfall area in the district.

## 2. Location of the Study

Nandurbar district is bounded by 21° 00' to 22° 03' North and latitude 73° 31' to 74° 32' East longitude. Nandurbar district comprises six tahsils namely Nandurbar, Navapur, Shahada, Taloda, and Akrani. The district has total area of 5034.23 sq. km.



## 3. Objectives of the Study

This research paper intends to study distribution and variability of rainfall in the district. It also intends to provide lesser average rainfall and rainfall variations in the district.

## 4. Database and Methodology

The present research paper is based on the tehsil-wise rainfall variability of Nandurbar district collected by Government of India, Ministry of Water resources, Central Ground water board, Central Nagpur. The data is of ten years from 2002 to 2011. The trend of rainfall is calculated and Mean, Standard deviation and Coefficient of variation of rainfall in Nandurbar district is calculated to study variability of rain.

**Table 1:** Tahsil wise rainfall variability of rainfall of Nandurbar district

Tahsils	Nandurbar	Nawapur	Shahada	Taloda	Akrani	Akkalkua
Years						
2002	969	764	405	572	943	667
2003	1265	1255	887	1065	1118	1024
2004	956	1720	604	880	1354	1035
2005	1284	2103	571	1099	924	1170
2006	1386	1456	1223	1653	2003	1164
2007	988	1504	810	1156	1088	1682
2008	759	1269	724	945	924	1512
2009	721	828	627	783	611	905
2010	753	1043	623	900	705	915
2011	619	860	573	827	797	1128
Mean	970	1280.2	704.7	988	1046.7	1180.2
S.D.	252.19	548.71	214.73	274.03	377.56	340.65
C.V. in %	25.99	42.86	30.37	27.73	36.07	28.86

Nandurbar district comes under hot and dry region of Maharashtra occupies 5034 sq.km having the population of 1646177 and the main occupation of the people is agriculture. Rainfall is of almost importance and it influences the social and economical life. It also decides the cropping pattern and different agricultural activities

To the south of Akrani tehsil rainfall decreases as Taloda received average rainfall of 988mm. for the decade. In the same way Nandurbar tehsil receives 970mm. in the eastern part of the district. Shahada tehsil received 704.07mm. rainfall in the last decade

The above given map shows that the co-efficient of rainfall variation during the period of 2002 to 2011 in Nandurbar district. The highest variation of Nawapur tehsil is 42.86 % while Akrani has the co-efficient of variation 36.07 % which is the second highest in the district. Shahada, Akkalkuwa and Taloda have the co-efficient of rainfall variation 30.47%, 28.86% and 27.73% respectively. The above table also indicates that Nandurbar has the lowest co-efficient of rainfall variation i.e. 25.99%.



## 5. Conclusion

The present study reveals that the distribution of rainfall pattern is uneven. The rainfall in the eastern part of the district is relatively lower than the rainfall in western part of the district. The average rainfall in the district is 801mm. The study of the rainfall in the given decade shows that Nawapur received the highest rainfall i.e. 1280.2mm and the lowest 704.07mm. by Shahada tehsil Nawapur has the highest co-efficient of variation i.e. 42.86 and Nandurbar has 25.99% variability which is the lowest in the region. Though Akrani and Akkalkuwa receives highest rainfall but the physiography of the tehsils are not favourable for the farming. On the contrary Shahada receives lower percentage of rainfall but the physiography of the tehsil is favourable for agricultural activities as Tapi river flows through the tehsils.

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The table indicates the 10 years tehsil wise rainfall variability of rainfall in Nandurbar district. The average rainfall of the decade in the district is 801. It clearly indicates that Nawapur tehsil received high rainfall i.e. 1280.2 mm. while Shahada received 704.7mm. rain, which is the lowest rainfall in the district. The percentage of rainfall increases in the westward direction of the district which includes Nawapur, Akkalkuwa, Akrani having the average annual rainfall 1280.2, 1180.2 and 1046.7 respectively.

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