

A Study of Spatio-Temporal Distribution of Rainfall for Rainfed Agricultural Planning of Ahmednagar District in Maharashtra

N. M. Patil

Ph.D. Assistant Professor. Department of Geography Padmashri Vikhe Patil College of Arts, Science and Commerce, Pravaranagar, A/P Loni Kd., Tal. Rahata, Dist. Ahmednagar (MS), India

Abstract

As the distributional pattern of rainfall highly influences whole of the agriculture sector, an attempt has been made in this paper to study the spatio-temporal variation of rainfall in Ahmednagar district of Maharashtra, where agriculture is the major economic activity of natives. The present study reveals that, the rainfall in the district is low and its nature of distribution is erratic. Thus, the farmers in this region are suggested to adapt some special agricultural planning to stabilize their income level.

KEYWORDS: Spatio-temporal, Distribution, Rainfall, Rainfed, Agriculture, Planning.

INTRODUCTION

The last century has experienced a tremendous pressure due to rapid growth of population with its increasing demand for basic resources like water. Agriculture, the major economic activity all over the world is highly affected due to the heavy stress on water resources. Rainfall, the natural source of water is the major parameter influencing agricultural activities of man (Mankar, 2010). It is the dominant single weather element influencing the intensity and location of farming system (Todkari, 2012). In India, where agriculture is the major economic activity, rainfall highly influences national economy. Not only the amount of rainfall received but also its distributional pattern affects the agricultural productivity. Thus, just, the amount of rainfall received cannot support the agricultural planning. With this view, an attempt has been made in this paper to study the spatio-temporal variations of rainfall in Ahmednagar district of Maharashtra. Such study may help in crop selection for rainfed agricultural planning.

STUDY AREA

Ahmednagar district is centrally located in the state of Maharashtra, between 18° 19' N and 19° 59' N latitudes and 73° 37' E and 75° 32' E longitudes. The geographical area of the district is 17,114 Sq. Km., and is divided into 14 talukas. Climate of the district is characterized by hot summer and general dryness throughout the year except during the period of southwest monsoon. The mean minimum temperature is 12.3°C while the mean maximum temperature is 39.1°C (Parchure et.al. 2010). The annual average rainfall of the district is 565 mm. The district being situated in rain shadow area of Western Ghats, it often suffers from drought. Physiographically, it is divided into hilly, ghats, foothill and plateau sections. The northern part of the district lies in Godavari basin while, its southern part belongs to the basin of river Bhima. Soils of the district are derived from Deccan Traps and are classified into shallow, medium and deep black types.

OBJECTIVES

The present paper confines itself to

1. Understand the spatio-temporal variation of rainfall.
2. Give suggestions for the planning of rainfed agriculture.

MATERIALS AND METHOD

The present study is based on 31 years (1981 to 2011) rainfall data collected from the official website of Ahmednagar district, developed by National Informatics Center, Pune. As the study area receives its major quantum of rainfall during five months period (June to October), the data for this period has been considered for the study. In this study, the district has been selected in general and tehsils in particular. The data (June to October) have been grouped into actual yearly rainfall of the study area and taluka wise average rainfall for 14 talukas of the district. The results obtained are presented with the help of map.

RESULTS AND DISCUSSION

As most of the Ahmednagar district comes under rain shadow zone of Western Ghats, the annual average rainfall of it is only 565 mm. The eastern and western parts of the district experiences slightly high rainfall as compared to the central part of it. The rainfall in the district is low.

Table 1. Average Rainfall (June to October) of Ahmednagar District (1981-2011)

Year	Average Rainfall (mm)	Year	Average Rainfall (mm)	Year	Average Rainfall (mm)
1981	531.5	1992	435.9	2003	303.0
1982	444.5	1993	583.9	2004	589.2
1983	679.3	1994	501.2	2005	551.5
1984	443.6	1995	470.5	2006	736.9
1985	401.8	1996	663.7	2007	556.5
1986	407.3	1997	372.8	2008	577.4
1987	553.8	1998	776.4	2009	510.3
1988	694.2	1999	409.8	2010	771.3
1989	673.1	2000	490.6	2011	488.4
1990	697.5	2001	372.8		
1991	468.8	2002	411.85		

Source: http://ahmednagar.nic.in/html_docs/rainfall_information_of_district.htm

Temporal Variation of Rainfall

The temporal variation in rainfall is insignificant and its distribution is erratic. Table 1 reveals that, the average rainfall (June to October) ranges between 303 mm (2003) and 776.4 mm (1998). The average annual rainfall of Ahmednagar district is 565 mm, out of which the five months period from June to October receives 535 mm (94%) of rain.

Spatial Variation in Rainfall

The spatial variation of rainfall in the district is not significant.

Table 2. Taluka wise average rainfall (June to October)

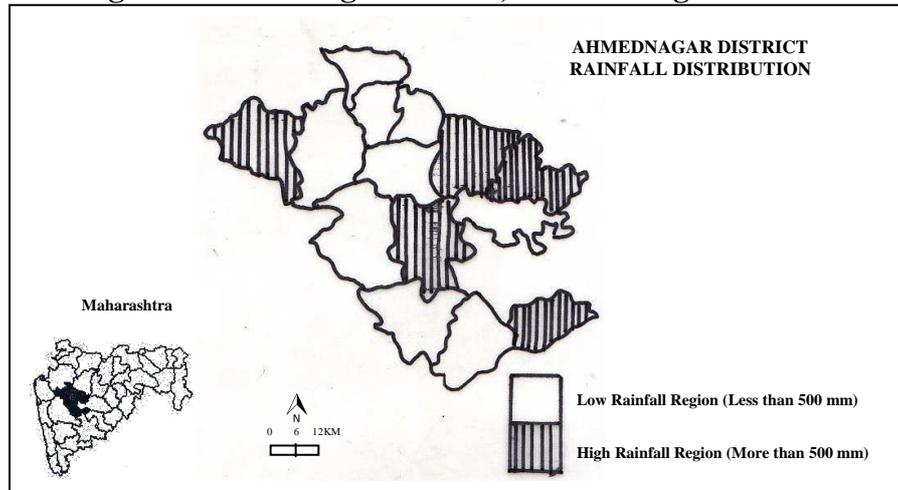
Sr.No.	Name of the taluka	Rainfall (mm)	Sr. No.	Name of the taluka	Rainfall (mm)
1	Akole	508.9	8	Pathardi	480.4
2	Jamkhed	583.3	9	Rahata	441.0

3	Karjat	493.0	10	Rahuri	455.0
4	Kopergaon	440.2	11	Sangamner	416.6
5	Nagar	531.1	12	Shevgaon	584.6
6	Newasa	531.3	13	Shrigonda	448.6
7	Parner	486.9	14	Shrirampur	464.0

Source: http://ahmednagar.nic.in/html_docs/rainfall_information_of_district.htm

Table 2 reveals that, the average rainfall (June to October) ranges between 416.6 mm at Sangamner and 584.6 mm at Shevgaon. The study shows that, the nature of rainfall in the district is unpredictable. On the basis of average rainfall (June to October), the district is divided into low and high rainfall regions (Figure 1).

Figure1: Ahmednagar Distrait, Rainfall Regions



Low Rainfall Region (Less than 500 mm)

The talukas (Karjat, Kopergaon, Parner, Pathardi, Rahata, Rahuri, Sangamner, Shrigonda and Shrirampur) receiving less than 500 mm rainfall belongs to this region. Sangamner records the lowest average rainfall i.e. 416.6 mm (June to October) in the region while the highest rainfall is recorded at Karjat (493 mm).

High Rainfall Region (More than 500 mm)

The high rainfall receiving talukas (Jamkhed, Nagar, Newasa, Shevgaon) lie in the eastern and westernmost (Akole) parts of the study area. In this region, the average rainfall (June to October) ranges between 508.9 mm at Akole and 584.6 mm. at Shevgaon.

CONCLUSION:

Though, the entire study area is divided into high and low rainfall regions, there is no much difference between the rainfall both of these regions receive.

SUGGESTIONS

1. In the areas of low rainfall and shallow soils where even low water demanding crops are not remunerative in rainfed condition, farmers may go for agro-forestry. They may grow tamarind, *amla*, custard apple, *ber*, wood apple, drum stick and neem.
2. Instead of sole cropping, farmers should adopt intercropping in whole of the district. Thus, it will possible to utilize most of available soil moisture.

3. Some medicinal plants like *Ritha*, Aloe, Belladona, Cintronella, *Sarpagandha*, *Shatawari*, *Hirda* may be grown on shallow soils.
4. The areas of medium and deep soils with good rainfall may bring under oil seeds and pulses like ground nut, soybean, green gram etc.
5. Dairy farming is one of the important economic activities being practiced in the study area. Growing grasses like blue panic and marvel-8 which can survive even in long dry spell should be grown on shallow soils.
6. *Jatropha curcas* and *Karanj (pogamia pinnata)* are now gaining popularity because of their medicinal value and usefulness for generating biodiesel. These plants may grow on low fertility lands and rocky tracts.
7. *Agave sisalana*, a less water demanding perennial fiber crop may be grown on shallow soils of low rainfall receiving area.

ACKNOWLEDGEMENT

Author is thankful to National Informatics Center (NIC), for making available rainfall data for Ahmednagar district in Maharashtra.

REFERENCES:

http://ahmednagar.nic.in/html_docs/rainfall_information_of_district.htm

Mankar, G., 2010, A study of Rainfall Characteristics of Mahabaleshwar Tehsil in Satara, Maharashtra state. *The Deccan Geographer*, Vol.48, No1, Pp 81-86.

Parchure,P.K., and Shende, R.R., 2010, Ground Water Information, Ahmednagar District, Maharashtra. Pp 3.

Todkari, G.U., 2012, A Geographical Study of Rainfall Variation in Solapur District of Maharashtra Sate, World Research Journal of Geoinformatics, Vol. 1, iss.1 Pp 11.