



THE STUDY OF RAINFALL VARIATION DURING MONSOON SEASON: A CASE STUDY OF YEDGAON STATION IN PUNE DISTRICT

Vilas Patil

Ramesh Gopale

Abstract

The present research paper attempts to analyze rainfall variation of Yedgaon station of Junner Tahsil. Major rainfalls in this Yedgaon dam region receive from south west monsoon which advects in the month of June to September. The region falls under monsoon climate (Am) climatic zone. The average rainfall in the tahsil is between 600 mm to 700 mm per annum. Yedgaon Dam is situated at eastern side of the Junner Tahsil place. This dam is situated on the Kukadi River which is originated at Nane Ghat of Ghatghar village in Sahyadri range. This station receives highest rainfall in the month of July while receives lesser rainfall in June month. The present study deals the rainfall variation of the Yedgaon station. The study has used 14 years data (2001 to 2014) monsoon season data for Yedgaon station. Which includes the rainfall trends and its variation during monsoon season.

Keywords: Trend, Variation, Rainfall, Dam,

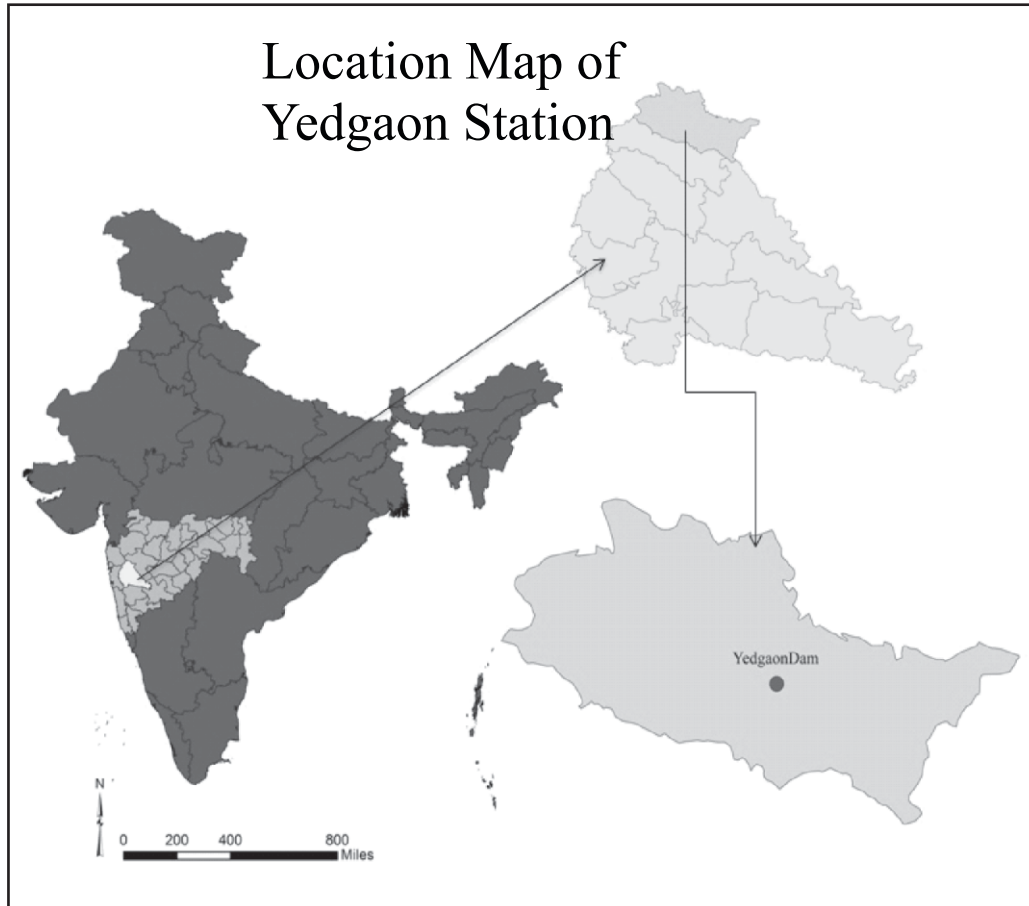
Introduction:

The degree to which rainfall amounts vary across an area or through time is an important characteristic of the climate of an area. This subject area in meteorology/ climatology is called 'rainfall variability'. There are two types of rainfall variability, areal variability and temporal variability. Areal Variability: The variation of rainfall amounts at various locations across a region. Temporal Variability: The variation of rainfall amounts at a given location across a time interval. Significance of rainfall variability is both temporal and areal variability of precipitation may be measured in various ways. The resulting numerical value can be used to characterize the climate of a region in various ways.

Today, there is strong evidence and understanding that climate is happening and it is recognized as being one of the greatest challenges of our century. Climate change affect with increased average annual temperatures, reduced and increased variability in rainfall reduces crop yield and threatens food security in low income and agriculture based economies (Meybeck et al., 2012). IPCC (2007) report confirmed a change to precipitation due to climate change. However, change in rainfall and temperature are not globally uniform (Parry et al., 2007). Precipitation trend analysis on different spatial and temporal scales has been of great concern during the past century because of the attention given to global climate change by the scientific community. Assessing rainfall trends and variability is paramount to understanding the variations in space and time. Main season is June to September; rainfall was recorded during south west monsoon season. Assessing trends and variability in rainfall based on past records helps with better understanding of problem associated with drought, floods and various water uses (Jain et al., 2012). The present study is provided an assessment of rainfall trends and variability at Yedgaon Dam station. We calculated to study variability and trends of rain. Yedgaon dam comes under tropical wet and dry climatic zone of Maharashtra by Koppen classification. Rainfall is almost important and it influences the social and economical life.

Location of the Study :

Yedgaondam is an earth fill and gravity dam on Kukadi River in Junner, Pune district in the state of Maharashtra. The dam is located in the Kukadi basin and it is part of the Kukadi Project. Yedgaon Dam situated 19.17' North latitude and 74.00' East longitudes.



Objectives of the Study:

This research paper intends to study rainfall trends and rainfall variation over the Yedgaon Dam station.

Database and Methodology:

The present research paper is based on year wise rainfall variation of Yedgaon dam station. Rainfall data collected from Yedgaon dam rain gauge station. The data is of 14 years from 2001 to 2014. The trend of rainfall is calculated and Mean, Standard deviation and Coefficient of variation of rainfall of Yedgaon Dam station.

Variability of Rainfall :

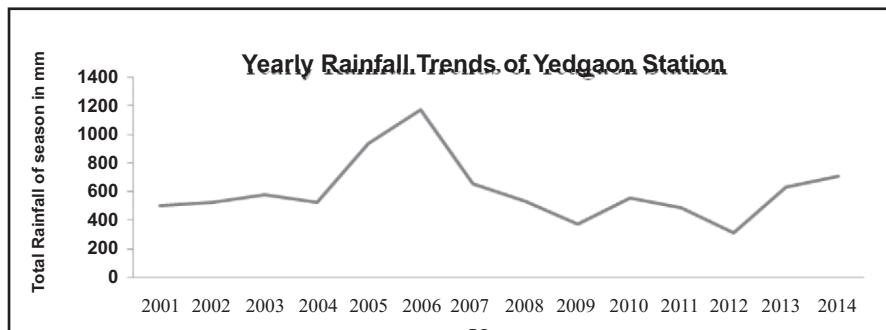
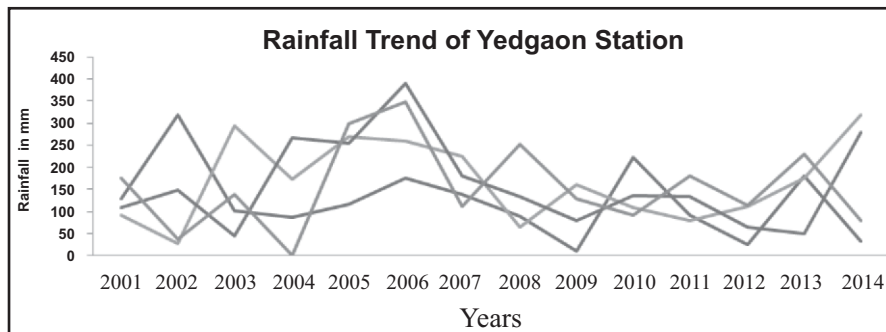
Variability defined as the deviation from mean or ratio of the standard deviation to the mean rainfall and in other words variability of coefficient of variation. The following table shows that the formula has been applied to find out the variability of the monsoon season rainfall variability.

Rainfall Variability

Table 1: Year wise rainfall variability of YedgaonDam Station.

Years	June	July	Aug.	Sept.	Total Rainfall (mm)	Mean Rainfall (mm)	Standard Deviation	Coefficient of Variation %
2001	127	89.4	107.6	175.2	499.2	124.8	31.99219	25.63476
2002	317	25	147	37	526	131.5	117.1783	89.10896
2003	100	292	44	137	573	143.25	92.04177	64.25254
2004	85	171	267	NA	523	130.75	74.62772	57.07665
2005	114	269	255	298	936	234	70.99648	30.34038
2006	174	258	390	347	1169	292.25	83.22973	28.47895
2007	137	223	181	111	652	163	42.73172	26.21578
2008	87	62	132	252	533	133.25	73.00471	54.78777
2009	9	159	79	127	374	93.5	56.48672	60.41361
2010	220	107	135	91	553	138.25	49.75628	35.99008
2011	91	77	134	180	482	77.5	58.90883	76.01139
2012	24	109	63	114	310	77.5	36.73214	47.39631
2013	180	175	49	228	632	158	66.24575	41.92769
2014	30	318	279	78	705	176.25	124.1901	70.46248
Total Rainfall (mm)	1695	2334.4	2262.6	2175.2				
Mean Rainfall (mm)	121	166.74	161.61	155.37				

(Source: Yedgaon Rain Gauge Station) (Computed by researcher)



The table indicates the 14 years rainfall data, year wise rainfall variation of rainfall at Yedgaon Dam station. The average rainfall of June month is 121 mm. July month received average rainfall 166.74 mm. the lowest rainfall recorded in the month June. The amount of rainfall increases from June to July month. After the July month amount of rainfall 2262.6 mm and 2175.2 mm, are start decreases in august and September month respectively. Its average rainfall is 600 to 700 mm, most of which falls during the monsoon months (June to September). The area adjacent to the Western Ghats gets more rain than areas further east. In the year 2005 and 2006 there were annual rainfall trend higher, that was 936 mm and 1169 mm respectively. After 2006 year rainfall trend start falls down up to 2009 year, again slightly increasing rainfall during 2010 and rainfall decrease in 2011 and 2012 year i. e. 482 mm. and 310 mm. Year wise lowest rainfall has recorded in 2012 year. Monsoon rainfall is uneven both in time and space, so it is important factors to evolving the rainfall analysis. Mainly the heavy rainfall occurs during the monsoon season and when the rainfall during the monsoon season is unequal both in time and space, so it is significant to analyze the rainfall variation. Overall, the observed trends have significant for rainfall variation. Coefficient of variation revealed that rainfall at Yedgaon station low annual variability. Yedgaon rain gauge station was received the highest rainfall of 1169 mm in 2006 year, whereas lowest rainfall has recorded 310 mm in 2012 year.

Conclusion :

This study is undertaken to understand rainfall variability of Yedgaon dam rain gauge station. In this study is used some statistical tools like mean, standard deviation and Coefficient of Variation to detect rainfall variability. Results for rainfall variation are indicated increasing and decreasing trends. South monsoon rainfall variability varies from 25.64 % to 89.11 percent, which is located in Yedgaon station. Very high rainfall variability (more than 89 percent) has been noticed in 2002 year. Moderate rainfall variability (more than 50 percent) has been in the 2003, 2004, 2008, 2009, 2011 and 2014 years. Low rainfall variability (less than 50 percent) has been identified in 2001 year i.e. 25.64 percent. During the monsoon season maximum years have low rainfall variability. Present study demonstrated rainfall trend and variability analysis for Yedgaon station of Junner Tahsil in Pune District. This will provide information on rainfall variability of the Yedgaon place and could be used as input for the local adaptation planning and to develop adaptation strategies for the study areas.

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***Dr. Vilas Patil**
Head, Dept. of Geography,
Shri Shahu Mandir Mahavidyalaya,
Parvati, Pune – 09.

****Mr. Ramesh Gopale**
Assist.Prof. Dept. of Geography,
Prof. Ramkrishna More College,
Akurdi, Pune – 44.