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Onset and withdrawal of monsoon in Ahmednagar district of Maharashtra

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Abstract

The monsoon plays important role to determine cropping pattern of any region. The onset and withdrawal data was obtained from the analysis of weekly rainfall data for all tehsils in Ahmednagar district. which indicated that Tehsils viz. Jamkhed, Newasa, Pathardi, Rahata, Shevgaon have mean week of onset of monsoon was 26 MW and for all other tehsils mean week of onset was 27 MW.

The mean week of withdrawal of monsoon was 41 MW observed for tehsils like Kopergaon, Newasa, Rahata, Shevgaon and Rahuri. For tehsils such as Akole, Jamkhed, Karjat, Pathardi and Rahuri the mean week of withdrawal was 42 MW, whereas 43 MW was observed to be the mean week of withdrawal for Ahmednagar, Parner, Sangamner and Shrigonda. Hence given research work study regarding onset and withdrawal of monsoon in Ahmednagar district of Maharashtra.

Keywords: Onset of monsoon, withdrawal of monsoon, mean duration of rainy days, the mean week of withdrawal, the mean week of onset

1. Introduction

In a state like Maharashtra, rain-fed agriculture accounts for 82% of total cultivable land. As a result, the arrival and departure of the monsoon have a significant impact on the agricultural schedule of farmers in this region. Farmers can make informed decisions about land preparation and irrigation based on information about the onset and withdrawal of the monsoon and the moisture content of the soil.

2. Materials and Methods

2.1 Study Area

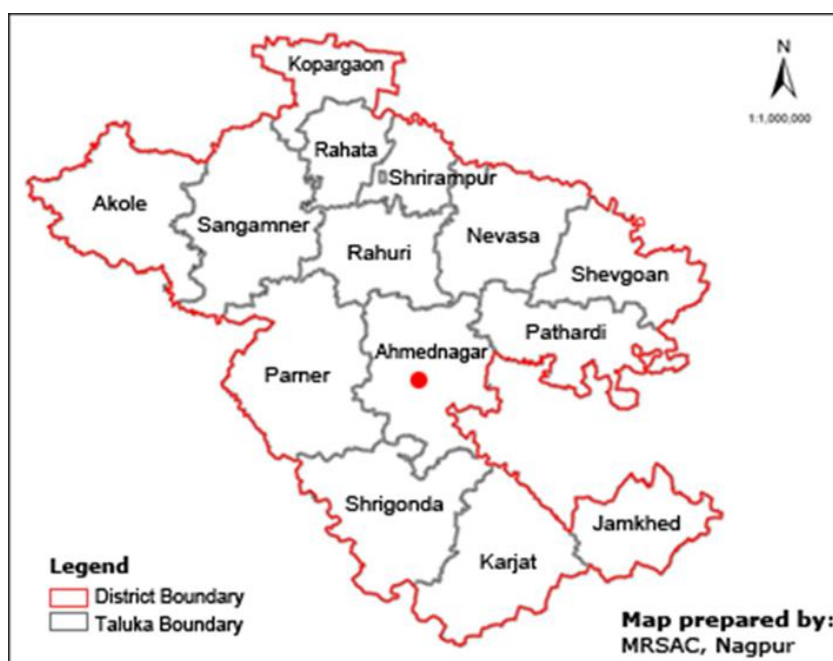


Fig 1: Map of Tehsils of Ahmednagar district

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Ahmednagar District is located at the latitude 19°09'N and longitudinal of 74°74' East. There are 14 tehsils in Ahmednagar district.

2.2 Data Acquisition

Each tahsil in the Ahmednagar district's daily rainfall data was gathered from

1. The Department of Agricultural Meteorology at the College of Agriculture, Pune
2. Pune-based India Meteorological Department
3. Downloaded from January and December of each year from (www.krishi.maharashtra.gov.in).

2.3 Software Used for Study

The STENDRF.EXE software was created at CRIDA, Hyderabad was utilized to determine onset and withdrawal of rainy season.

2.4 Methodology

2.4.1 Determination of onset and withdrawal of monsoon season

The initial appearance and withdrawal of the annual rainy season from weekly rainfall data were computed using forward and backward accumulation methods. Weekly rainfall was summed by forward accumulation (20+21+...+52 weeks) until a particular amount of rainfall was accumulated. The commencement of the growing season of crops and land preparation has been regarded to be 75 mm of rainfall accumulation (Babu and Lakshminarayana, 1997) ^[1]. Backward accumulation of rainfall (48+47+46+...+30 weeks) data was used to determine the withdrawal of the rainy season. After harvesting the crops, 20 mm of rainfall accumulation was chosen at the conclusion of the rainy season (Babu and Lakshminarayana, 1997) ^[1]. Based on the existing rainfall conditions in the selected location, 50 mm of rainfall accumulation was used as the onset time and 10 mm of rainfall accumulation was used as the withdrawal time.

3. Results and Discussion

3.1 Onset and withdrawal of Monsoon for Ahmednagar Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 27 MW and 43 MW was the mean week of commencement and the mean week of departure respectively. Which gives 16 weeks (112 days) of length of rainy season. The inaugural and last weeks of the rainy season were 23 and 41 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 37 years. As a result, the commencement of rainy season in Ahmednagar tehsil is presumed from 18th of June to 8th July. Table No.1.

3.2 Onset and withdrawal of Monsoon for Akole Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 27 MW and 41 MW was the mean week of commencement and the mean week of departure respectively. Which gives 16 weeks (112 days) of length of rainy season. The inaugural and last weeks of the rainy season were 27 and 41 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was

observed for 33 years. As a result, the commencement of rainy season in Akole tehsil is presumed from 18th of June to 8th July. Table No.1.

3.3 Onset and withdrawal of Monsoon for Jamkhed Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 26 MW and 42 MW was the mean week of commencement and the mean week of departure respectively. Which gives 16 weeks (112 days) of length of rainy season. The inaugural and last weeks of the rainy season were 26 and 42 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of was monsoon about 50%, which was observed for 29 years. As a result, the commencement of rainy season in Jamkhed tehsil is presumed from 18th of June to 8th July. Table No.1.

3.4 Onset and withdrawal of Monsoon for Karjat Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 27 MW and 42 MW was the mean week of commencement and the mean week of departure respectively. Which gives 15 weeks (105 days) of length of rainy season. The inaugural and last weeks of the rainy season were 27 and 42 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 33 years. As a result, the commencement of rainy season in Karjat tehsil is presumed from 18th of June to 8th July. Table No.1.

3.5 Onset and withdrawal of Monsoon for Kopergaon Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 27 MW and 41 MW was the mean week of commencement and the mean week of departure respectively. Which gives 14 weeks (98 days) of length of rainy season. The inaugural and last weeks of the rainy season were 27 and 41 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 30 years. As a result, the commencement of rainy season in Kopergaon tehsil is presumed from 18th of June to 8th July. Table No.1.

3.6 Onset and withdrawal of Monsoon for Newasa Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 26 MW and 41 MW was the mean week of commencement and the mean week of departure respectively. Which gives 15 weeks (105 days) of length of rainy season. The inaugural and last weeks of the rainy season were 26 and 41 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 34 years. As a result, the commencement of rainy season in Newasa tehsil is presumed from 18th of June to 8th July. Table No.1.

3.7 Onset and withdrawal of Monsoon for Parner Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 27 MW and 43 MW was the

mean week of commencement and the mean week of departure respectively. Which gives 16 weeks (112 days) of length of rainy season. The inaugural and last weeks of the rainy season were 27 and 43 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 27 years. As a result, the commencement of rainy season in Parner tehsil is presumed from 18th of June to 8th July. Table No.1.

3.8 Onset and withdrawal of Monsoon for Pathardi Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 26 MW and 42 MW was the mean week of commencement and the mean week of departure respectively. Which gives 15 weeks (105 days) of length of rainy season. The inaugural and last weeks of the rainy season were 26 and 42 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 32 years. As a result, the commencement of rainy season in Pathardi tehsil is presumed from 18th of June to 8th July. Table No.1.

3.9 Onset and withdrawal of Monsoon for Rahata Tehsil

The assessment of 24 years of weekly data of precipitation (1998-2021) revealed that the 26 MW and 41 MW was the mean week of commencement and the mean week of departure respectively. Which gives 15 weeks (105 days) of length of rainy season. The inaugural and last weeks of the rainy season were 26 and 41 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 9 years. As a result, the commencement of rainy season in Rahata tehsil is presumed from 18th of June to 8th July. Table No.1.

3.10 Onset and withdrawal of Monsoon for Rahuri Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 27 MW and 42 MW was the mean week of commencement and the mean week of departure respectively. Which gives 15 weeks (105 days) of length of rainy season. The inaugural and last weeks of the rainy season were 27 and 42 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 21 years. As a result, the commencement of rainy season in Rahuri tehsil is presumed from 18th of June to 8th July. Table No.1.

3.11 Onset and withdrawal of Monsoon for Sangamner Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 27 MW and 43 MW was the mean week of commencement and the mean week of departure respectively. Which gives 15 weeks (105 days) of length of rainy season. The inaugural and last weeks of the rainy season were 27 and 43 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 24 years. As a result, the commencement of

rainy season in Sangamner tehsil is presumed from 18th of June to 8th July. Table No.1.

3.12 Onset and withdrawal of Monsoon for Shevgaon Tehsil

The assessment of 24 years of weekly data of precipitation (1998-2021) revealed that the 26 MW and 41 MW was the mean week of commencement and the mean week of departure respectively. Which gives 15 weeks (105 days) of length of rainy season. The inaugural and last weeks of the rainy season were 26 and 41 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 13 years. As a result, the commencement of rainy season in Shevgaon tehsil is presumed from 18th of June to 8th July. Table No.1.

3.13 Onset and withdrawal of Monsoon for Shrigonda Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 27 MW and 43 MW was the mean week of commencement and the mean week of departure respectively. Which gives 16 weeks (112 days) of length of rainy season. The inaugural and last weeks of the rainy season were 27 and 43 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 24 years. As a result, the commencement of rainy season in Shrigonda tehsil is presumed from 18th of June to 8th July. Table No.1.

3.14 Onset and withdrawal of Monsoon for Shrirampur Tehsil

The assessment of 61 years of weekly data of precipitation (1961-2021) revealed that the 27 MW and 41 MW was the mean week of commencement and the mean week of departure respectively. Which gives 15 weeks (105 days) of length of rainy season. The inaugural and last weeks of the rainy season were 27 and 41 Meteorological Week, respectively. nevertheless, after overall examination, the 25 MW and 27 MW provides the probability of the commencement of monsoon was about 50%, which was observed for 30 years. As a result, the commencement of rainy season in Shrirampur tehsil is presumed from 18th of June to 8th July. Table No.1.

Table 1: Mean week of Commencement and departure of monsoon in Ahmednagar district

Tehsil	Mean week of onset of monsoon	Mean week of withdrawal of monsoon
Ahmednagar	27	43
Akole	27	42
Jamkhed	26	42
Karjat	27	42
Kopergaon	27	41
Newasa	26	41
Parner	27	43
Pathardi	26	42
Rahata	26	41
Rahuri	27	42
Sangamner	27	43
Shevgaon	26	41
Shrigonda	27	43
Shrirampur	27	41

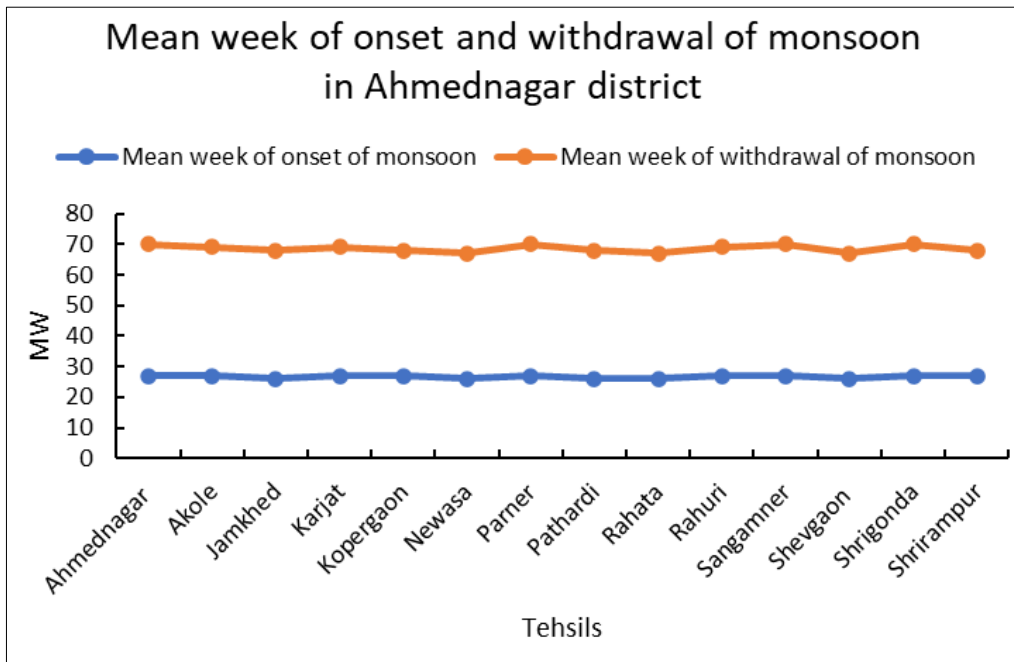


Fig 2: Mean week of Commencement and departure of monsoon in Ahmednagar district

Table 2: Mean period of rainy season in various tehsils of Ahmednagar district

Tehsils	Period (Week)
Ahmednagar	16
Akole	16
Jamkhed	16
Karjat	15
Kopergaon	14
Newasa	15
Parner	16
Pathardi	15
Rahata	15
Rahuri	15
Sangamner	15
Shevgaon	15
Shrigonda	16
Shrirampur	15

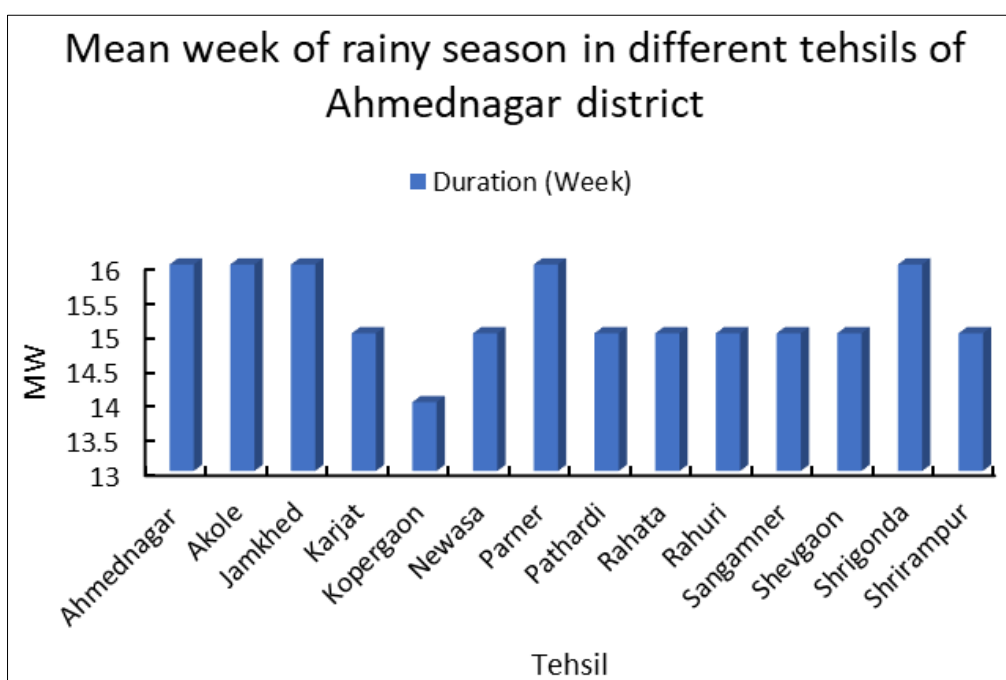


Fig 3: Mean Period of rainy season in different tehsils of Ahmednagar district

4. Conclusion

The Onset and withdrawal data was obtained from the analysis of weekly rainfall data for all tehsils in Ahmednagar district. which indicated that Tehsils *viz.* Jamkhed, Newasa, Pathardi, Rahata, Shevgaon have mean week of onset of monsoon was 26 MW and all other tehsils like Ahmednagar, Akole, Karjat, Kopergaon, Parner, Rahuri, Sangamner, Shrigonda, Shrirampur mean week of onset was 27 MW.

As per the data of onset and withdrawal, it was observed that for tehsils such as Kopergaon, Newasa, Rahata, Shevgaon and Rahuri, the mean week of departure was 41 MW. For tehsils such as Akole, Jamkhed, Karjat, Pathardi and Rahuri the mean week of departure was 42 MW, whereas 43 MW was observed to be the mean week of withdrawal for Ahmednagar, Parner, Sangamner and Shrigonda.

According to the data on the length of the rainy season, it was found that for tehsils *viz.* Karjat, Newasa, Pathardi, Rahata, Rahuri, Sangamner, Shevgaon and Shrirampur the mean period of the rainy season was found to be 15 weeks (105 days). Whereas Maximum mean period of rainy season 16 weeks (112 days) was observed for tehsils *viz.* Ahmednagar, Akole, Jamkhed, Parner and Shrigonda. The minimum period of the monsoon season was observed at Parner for 14 weeks (98 days). Based on this data of onset and withdrawal various cultural practices can be followed.

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