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Research Paper :

Probability analysis of monthly and seasonal rainfall at Solapur, Maharashtra

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ABSTRACT

The awareness of rainfall pattern, in terms of probability, helps in the planning of crops, different irrigation schemes and watershed management. Keeping it in view, the rainfall data of 22 years, from 1987 to 2008, were collected from the Dry Farming Research Station; Solapur were analyzed and discussed in this paper. Average annual rainfall was found to be 732.4 mm. Normal, surplus and drought months as well as seasons and years have been presented which may be useful for planning of agriculture and irrigation schemes. The per cent probability of *Zaid* and *Kharif* seasons to be normal is 81.82 % and 77.27 %, respectively. The probability for *Kharif* season to be drought is 4.55 % while that of *Zaid* season is 9.09 %. Total amount of rainwater available during the*Kharif*, *Rabi* and *Zaid* seasons was found to be in the range of 280.7 – 1100.3 mm, 0.0 – 128.7 mm and 63.7 – 452.5 mm, respectively. Thus the surplus amount of water during *Kharif* season may be stored in water harvesting structures, in order to provide supplemental irrigation for growing of wheat crop in *Rabi* season or in order to help in recharge of ground water.

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Rainfall analysis is not only important for agricultural production but also for other administrative purposes. The distribution pattern of rainfall rather than the total rainfall during the entire period of time is more important for studying the pattern of rainfall occurrence. Of all the facts, water is the most precious and limiting natural resource in the world. Economic developments of any country depend on the factors in which water is one of the outstanding factor. Rainfall which is the main source of available water, play an important role in designing soil conservation structures, water harvesting structures, crop planning as well as watershed management strategies made by state government time to time. The probability distribution analysis of normal and surplus rainfall values, and drought events (months, seasons and years) were carried out for Solapur district of Maharashtra. The rainfall data of 22 years, from 1987 to 2008, were collected from Dry Farming Research Station; Solapur. Not only the farmer but also the policy makers and funding agencies have to depend on the seasonal rainfall. For seasonal analysis, therefore, the whole year was divided into three seasons *i.e. Kharif* (July to October), *Rabi* (November to February) and zaid (March to June). These were also classified as wettest and driest seasons on the basis of seasonal rainfall above and below the average annual rainfall of this district.

Pimpale *et al.* (2000) analyzed the rainfall data of 29 years (1970 - 1998) for finding out drought, normality and abnormality probability for Akola, Maharashtra. Ali (2002) tested the most important drought indices in different agro-ecological region for monitoring and analysis of drought conditions in the country. Thokal *et al.* (2003) studied the rainfall data of 31 years (1972 – 2002) of Dapoli located in Konakan region of Maharashtra state, was statistically analyzed weekly data of rainfall was found to be more useful for crop planning as water management practices than monthly, seasonal and annual data.

As rainwater utilization technology has to be site specific, it is necessary to use frequency analysis methodology for working out a strategy. Use of data analysis for crop management in irrigated and rainfed agriculture has been reported by several researchers for different regions (Druvanarayana *et al.,* 1978; Sharma *et al.,* 1979; Patil and Patil, 1989). In view of these objectives, analyses of rainfall on all these aspects have been undertaken for Solapur region of Maharashtra.

METHODOLOGY

The daily rainfall data were collected from Dry