International Journal of Agricultural Engineering, Vol. 2 No. 1 : 103-106 (April to September 2009)

Study of ITK rainfall analysis in drought prone areas

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Accepted : ***February, 2009***

ABSTRACT

The Nakshtrawise analysis (ITK) for Drought Prone Areas of Maharashtra was carried out during the year 1947-2005. The rainfall data as per the availability was analysed for study. In southern part, the initial probability of getting >50% rainfall was in Mrugashira nakshtra at Mohol in *kharif* season only. While, it was in Uttara and Hasta nakshtra at Jeur and Padegaon, Purva, Uttara and Hasta nakshtra at Mohol and Solapur and Purva and Hasta nakshtra at Pandharpur indicating that *rabi* cropping can be under taken in these nakshtras. Further, it is interesting to note that the mid season correction or contingent crop planning can be under taken in Pushya and Aashlesha nakshtra at Solapur. In northern part at Dhule, >50 mm rainfall was received in Mrugashira to Magha nakshtra with less variability (CV. <100). In central part, the rainfall in Mrugashira nakshtra at Kopergaon and Rahuri and Aaridra nakshtra at Kopergaon have less variability (CV. < 100) in *kharif* season. Whereas, Purva, Uttara and Hasta nakshtra in *rabi* season has less variability at Rahuri and Chas (CV. < 100). In southern part, at all the selected places the Mrugashira nakshtra has less variability (CV. <100 %). Whereas, Punarvasu and Pushya nakshtra at Mohol, Aaridra nakshtra at Pandharpur, Aaridra, Punarvasu and Aashelsha at Padegaon and Aaridra to Pushya nakshtra at Solapur has less variability. In norhtern part at Dhule, Mrugashira to Purva nakshtras have the highest probability (>50%) while, Purva nakshtra has the highest initial probability (73%).In central part, the highest initial probability (>50%) of rainfall in Mrugashira nakshtra was only at Rahuri, whereas the probability of rainfall in Purva to Hasta nakshtra at Rahuri and Chas indicated *rabi* cropping can be under taken at Rahuri and Chas.

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Key words : Variability, Probability, Nakshatra, Rainfall

The available information on climatic parameters *i.e.* rainfall is essential to analyze the potential of particular parameter which affect the crop production, crop distribution. Suitability of a crop to a place is generally referred in context to the annual rainfall and its distribution during the crop growth or crop growing season is a far more important.

In Scarcity Zone, year to year rainfall fluctuations are varied. Low or delay in rainfall is either in *kharif* or *rabi* or during both the seasons. (Patil *et al*., 1989)The common feature of the region is characterized by inadequate, ill distributed and undependable rainfall. The annual precipitation is less than 750 mm in 30 to 45 rainy days (Thawal *et al*., 1997). Two peaks of rainfall are generally observed, first during June-July and second during September with high intensity resulting in bi-modal pattern of rainfall distribution (Gaikwad *et al.*, 1996).

Moisture is the most limiting factor for crop production in semi-arid region, the greatest risk to crop yields in Indian agriculture is attributed to the variability of seasonal rainfall and the uncertainty in the amount and distribution of rainfall for a given season (Virmani *et al.*, 1991).

Hence, the rainfall normal of the various 9 places in the Scarcity Zone for nakshtra period was worked out and presented in this paper.

METHODOLOGY

Rainfall data for last 40 to 49 years as per availability for the period of 1947 to 2005 was collected from India Meteorological Department, Pune (M.S.) and used for analysis of this study. The Nakshatrawise rainfall probability and variability analysis was carried out by using Markov chain model as suggested by Mavi, 1994; Ramana Rao *et al*., 1994. However, dryspell and wetspell was calculated by using the formula given by Ramdas, 1950.

RESULTS AND DISCUSSION

Nakshtrawise rainfall probability :

The initial probability of getting rainfall >20mm and 40 mm per nakshtra at selected places was worked out and presented in Table 1.

In southern part, the initial probability of getting >50% rainfall was in Mrugashira nakshtra at Mohol in *kharif* season only. While, it was in Uttara and Hasta nakshtra at Jeur and Padegaon, Purva, Uttara and Hasta nakshtra at Mohol and Solapur and Purva and Hasta nakshtra at Pandharpur indicating that *rabi* cropping can be under taken in these nakshtras.