

Rainfall and drought characteristics for crop planning in Palamau region of Jharkhand

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(Received 19 September 2012, Modified 21 November 2012)

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सार – इस शोध पत्र में झारखंड के पलामू जिले के विगत 56 वर्षों (1956–2011) की दैनिक वर्षा के आँकड़ों की लम्बी अवधि के औसत एवं इसके साप्ताहिक, मासिक, मौसमी एवं वार्षिक उतार चढ़ाव के विश्लेषण के लिए प्रयुक्त किया गया है। पलामू जिले की औसत वार्षिक वर्षा 34 प्रतिशत की परिवर्तनशीलता के साथ 1138 मिलीमीटर पाई गई है जो यह दर्शाता है कि इन वर्षों में वर्षा की मात्रा स्थिर नहीं रही। मानसून के जुलाई माह में यहाँ सर्वाधिक औसत वर्षा 332 मिलीमीटर तथा अगस्त माह में 310 मिलीमीटर होती है। पिछले 56 वर्षों की वर्षा के रुझान का विश्लेषण यह दर्शाता है कि वर्षा की मात्रा में वार्षिक तौर पर 8.33 मिलीमीटर एवं खरीफ मौसम (जून से सितम्बर माह) में 7.04 मिलीमीटर की कमी हुई है। सूखा मुख्यतः खरीफ मौसम की शुरुआत में (जून माह का अंतिम पखवाड़ा) एवं अंतिम चरणों में देखा गया। इस क्षेत्र के लिए वर्षा के पैटर्न के अनुकूल कम अवधि एवं कम पानी की आवश्यकता वाली परंतु उच्च मूल्य की फसलें जैसे मकई, दलहन, तेलहन एवं कुछ सब्जियों की खेती की जा सकती है।

ABSTRACT. Daily rainfall data of 56 years (1956-2011) of Palamau district of Jharkhand have been considered to analyse the long term average and its temporal variability on weekly, monthly, seasonal and annual basis. The average annual rainfall at Palamau was 1138 mm with 34 per cent coefficient of variation indicating thereby that the rainfall was not much stable over the years. July was the highest rainfall recipient month (332 mm) followed by August (310 mm) during the monsoon period. Trend analysis on rainfall of past 56 years exhibited a decreasing pattern of 8.33 mm and 7.04 mm per year in annual and kharif season rainfall, respectively. Agricultural drought was most frequently observed in early (23-26 SMW) as well as late (37-40 SMW) stages of kharif crops. Meteorological droughts of different intensities, viz., mild, moderate and severe over the observed periods showed that station is prone to mild-moderate type of drought. Short duration, low water requiring but high value crops like maize, pulses, oilseeds and some vegetables can be opted for this region to minimize the production risk.

Key words – Rainfall variability, Initial and conditional probability, Meteorological and agricultural drought, Crop planning.

1. Introduction

Rainfall being a nature's blessing and drought a curse for the whole living world are decisive weather phenomenon for ensuring or threatening our food security. Characterisation of these weather events would certainly be helpful in framing out the strategies to minimise the risk toward sustainable production. Interpretation of rainfall records in relation to the local agricultural practice that are followed is necessary to bring out the implications of rainfall variability in agricultural planning and management. Palamau, located in the Western Plateau sub-zone (zone V) of Jharkhand state, is a unique district to have a typical monsoon climate which often becomes a rain-shadow area. The region is classified as dry sub-humid zone of Jharkhand. Frequent occurrence of drought with uneven spatial and temporal distribution of rainfall

has been affecting the sustainable development of society and economy of the district. Climatological data of a location is of utmost importance towards minimising production risk (Vairavan *et al.*, 2002). In this context, the concept of estimating probabilities with respect to a given amount of rainfall is extremely useful for planning appropriate agricultural operations/activities. The Markov chain model has been extensively used to study the probabilities of rainfall occurrence (Gaberial and Newman, 1962; Victor and Sastry, 1979; Kar 2002; Singh *et al.*, 2008). In a given crop growing season, many a times, decisions have to be taken based on the probability of receiving certain amount of rainfall during a given week. Agriculture is mainly rainfed and rice is the main crop of the region. Knowledge of frequency and intensity of drought is essential for crop selection, their management and over all agricultural planning of a region.