Forecasting and Validation of Rainfall for Barshi in Maharashtra Based on Astro-meteorological Principle of Rainfall Conception

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Abstract

Rainfall prediction has prime importance in an agrarian country like India, wherein the agricultural production is solely dependent on the monsoon rainfall. Among various astro-meteorological methods for rainfall forecasting, the Antariksha *method, which is based on sky observations, is most popular. The observations of rainfall conception based on 16 symptoms recorded for the period (approximately six months, i.e., 180 days) between* Ashwin Krishna Paksha *[dark half of* Ashwin *(October–November)] in 2003 and* Vaishakh Purnima *[full moon of* Vaishakh *(April–May)] in 2004 were used for daily prediction of rainfall during the ensuing monsoon season of 2004 for Barshi, Solapur district, Maharashtra. Similarly the predictions for the monsoon season of 2005, 2006, 2007, and 2008 were made from rainfall conception observations. The analysis was done to find out the most important rainfall conception symptoms responsible for rainfall delivery. The analysis revealed that on an average for five years, symptom number 1, i.e., observation of rainy clouds had the highest frequency of 79.6%, while the symptom number 4, i.e., squalls had the lowest frequency (22.5%). The rainfall conception period was maximum (65 days) during 2005, while it was minimum (35 days) during 2007 indicating lower number of rain events during monsoon season of 2007.*

The average skill scores for June, July, August, September, and October were 73.3, 79.2, 75.5, 79.3, and 86.4%, respectively. The yearly average skill scores were 75.2, 77.8, 87.6, 74.4, and 78.8% for 2004, 2005, 2006, 2007, and 2008, respectively. The overall average skill score for rainfall prediction was 78.8%. Thus, it can be concluded that rainfall conception observations can be used successfully for rainfall prediction for that locality. The rainfall prediction dates were published in the local newspapers in April–May and were used by the farming community in Barshi for crop planning and farm operations.