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Earth System Science Organization (ESSO)
Ministry of Earth Sciences (MoES)
India Meteorological Department

Long Range Forecast Update for 2015 Southwest Monsoon Rainfall

HIGHLIGHTS

- Rainfall over the country as a whole for the 2015 southwest monsoon season (June to September) is likely to be deficient (<90% of LPA).
- Quantitatively, monsoon season rainfall for the country as a whole is likely to be 88% of the long period average with a model error of ±4%.
- Region wise, the season rainfall is likely to be 85% of LPA over North-West India, 90% of LPA over Central India, 92% of LPA over South Peninsula and 90% of LPA over North-East India all with a model error of ± 8 %.
- The monthly rainfall over the country as whole is likely to be 92% of its LPA during July and 90% of LPA during August both with a model error of ± 9 %.

1. Background

ESSO-India Meteorological Department (IMD) issues the operational long range forecasts for the southwest monsoon season (June-September) rainfall over the country as a whole in two stages; in April and in June. In June, in addition to the update for the forecast for the season rainfall over the country as a whole issued in April, forecasts for the monthly rainfall for July & August over the country as a whole, and forecast for the season rainfall for the 4 broad geographical regions of India (NW India, NE India, Central India and South Peninsula) are issued.

The update forecast for the southwest monsoon season (June-September) rainfall over the country as a whole is issued using a 6-parameter Ensemble Forecasting System. The 6 predictors used are: NE Pacific to NW Atlantic SST Anomaly Gradient (December + January), Southeast equatorial Indian Ocean Sea Surface Temperature (February), East Asia Mean Sea Level Pressure (February + March), Central Pacific (Nino 3.4) Sea Surface Temperature (March to May + tendency between March to May & December to February), North Atlantic Mean Sea Level Pressure (May) and Northcentral Pacific 850 zonal wind gradient (May).

2. Sea Surface Temperature Conditions in the Pacific & Indian Oceans

Since April, 2015 weak El Nino conditions are established over equatorial Pacific Ocean. Atmospheric conditions like weakened trade winds, negative Southern Oscillation Index (SOI) values etc. generally associated with El Nino conditions are also observed. The

latest forecast from IMD-IITM coupled model indicates El Nino conditions are likely to strengthen further and reach to moderate strength during the monsoon season. There is about 90% probability of El Nino conditions to continue during the southwest monsoon season. Over Indian Ocean, currently, slight basin wide warming along with neutral Indian Ocean Dipole (IOD) conditions is prevailing. The latest forecast from ESSO-IMD-IITM coupled model indicates about 50% probability of neutral IOD conditions to continue during the monsoon season.

3. Monsoon Mission Experimental Coupled Dynamical Model Forecast

The experimental forecast based on the ESSO-IMD-IITM coupled dynamical model suggest that the monsoon rainfall during the 2015 monsoon season (June to September) averaged over the country as a whole is likely to be 86% ± 5% of long period model average (LPMA). The experimental five category probability forecasts for the 2015 monsoon season rainfall over the country as a whole using the experimental dynamical prediction system are 61% (deficient), 24% (below normal), 13% (normal), 2% (above normal) and 0% (excess).

4. The second Stage Forecasts for 2015 Southwest Monsoon Rainfall

i) Seasonal (June-September) Rainfall over the country as a whole

Quantitatively, the season rainfall for the country as a whole is likely to be 88% of the long period average (LPA) with a model error of ±4%. The LPA rainfall over the country as a whole for the period 1951-2000 is 89 cm.

The 5 category probability forecasts for the Season (June to September) rainfall over the country as a whole is given below.

Category	Rainfall Range (% of LPA)	Forecast Probability (%)	Climatological Probability (%)
Deficient	< 90	**66**	16
Below Normal	90 - 96	**27**	17
Normal	96 -104	**7**	33
Above Normal	104 -110	**0**	16
Excess	> 110	**0**	17

ii) Season (June-September) Rainfall over Broad Geographical Regions

The season rainfall is likely to be 85% of LPA over North-West India, 90% of LPA over Central India, 92% of LPA over South Peninsula, and 90% of LPA over North-East India all with a model error of ± 8 %.

iii) Monthly (July & August) Rainfall over the country as a whole

The rainfall over the country as a whole is likely to be 92% of its LPA during July and 90% of LPA during August both with a model error of ± 9 %.