PRESS RELEASE

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INDIA METEOROLOGICAL DEPARTMENT

Long range forecast update for the 2008 Southwest monsoon rainfall

1. **Background**

India Meteorological Department (IMD) has been following a two-stage forecast strategy for the southwest monsoon rainfall over the country as a whole, in which the first forecast is issued in April and the forecast update is issued by end of June. Based on a 5-parameter ensemble statistical model, IMD issued the following forecast for the 2008 southwest monsoon rainfall over the country as a whole.

IMD's long range forecast for the 2008 south-west monsoon season (June to September) is that the rainfall for the country as a whole is likely to be Near Normal. Quantitatively, monsoon season rainfall is likely to be 99% of the long period average with a model error of ± 5%. The Long period average rainfall over the country as a whole for the period 1941-1990 is 89 cm.

2. Second Stage Forecasts

IMD has now prepared the following forecasts, which are being released now:

a) Forecast update for the 2008 southwest monsoon rainfall over the country as a whole using a 6-parameter ensemble statistical model with a model error of ± 4%.

b) Forecast for the rainfall over the country as a whole in the month of July based on a 6-parameter model, which has a model error of ± 9%.

c) Forecasts for the South-west Monsoon season (June-September) rainfall for the following four broad geographical regions of India with a model error of ± 8%:

Northwest India – Jammu and Kashmir, Himachal Pradesh, Punjab, Rajasthan, Haryana, Chandigarh, Delhi, Uttaranchal and Uttar Pradesh.

Northeast India – Arunachal Pradesh, Meghalaya, Assam, Nagaland, Manipur, Mizoram, Tripura, Sikkim, West Bengal, Bihar and Jharkhand.

Central India – Gujarat State, Madhya Pradesh, Chattisgarh, Maharashtra, Goa and Orissa.

South Peninsula – Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Lakshadweep and Andaman and Nicobar Islands.

The long period average and coefficient of variation of rainfall based on the 1941-1990 data are given below:

Area	Long period Average (mm)	Coefficient of variation (%)
All India (June to September)	890	10
All India (July)	293	13
NW India	612	19
Central India	994	14
NE India	1429	8
South Peninsula	725	15

3. Experimental Forecasts

IMD has also generated experimental forecast for the 2008 southwest monsoon rainfall based on the IMD's dynamical forecast system (Seasonal Forecast model of the Experimental Climate Prediction Centre (ECPC), USA). The forecast was generated using observed global sea surface temperature data of May.

In addition, IMD has taken into account the experimental forecasts prepared by national institutes like Indian Institute of Tropical Meteorology, Pune, National Centre for Medium Range Weather Forecast (NCMRWF), Noida, Indian Institute of Science (IISc), Bangalore, Space Applications Centre (SAC), Ahmedabad, National Aerospace Laboratory (NAL), Bangalore and Centre for Mathematical Modelling and Computer Simulation (CMMACS) Bangalore and operational forecasts prepared by international institutes like the National Centers for Environmental Prediction (NCEP), USA, International Research Institute for Climate and Society (IRI), USA, Meteorological Office, UK, the European Center for Medium Range Weather Forecasts(ECMWF), UK, the Tokyo Climate Centre (TCC), Japan and the Experimental Climate Prediction Center (ECPC), USA.

4. Onset and Advance of Monsoon 2008

The onset phase of monsoon was marked by early rains over most parts of the country. Southwest monsoon advanced over south Andaman Sea on 10 May, almost 10 days earlier than the normal date. In the press release issued on 14th May 2008, IMD had predicted that the monsoon onset over Kerala this year would take place on 29th May with a model error of ±4 days. Southwest Monsoon set in over Kerala on 31st May. It rapidly advanced into more parts of southern peninsula and northeast India by 2 June. On 7 June, it further advanced into most parts of Konkan and Goa and north interior Karnataka, some parts of Madhya Maharashtra, Rayalaseema, Telengana, and coastal Andhra Pradesh, sub-Himalayan west Bengal and entire Sikkim. Monsoon advanced into Mumbai city on 7 June, three days earlier than its normal date. By 11 June, monsoon advanced into Gujarat state, Marathawada, Vidarbha, Chattisgarh, and Jharkhand and on 12 June, it advanced into some parts of Madhya Pradesh and east Uttar Pradesh. On 15 June, monsoon advanced into some parts of Rajasthan and west Uttar Pradesh, entire west Madhya Pradesh, some parts of Haryana and entire Punjab. On 16 June, it covered the entire Uttar Pradesh and Haryana. As on 16 June, the northern limit of monsoon passed

through 25^0N/60^0 E, 25^0N/65^0E, Mount Abu, Jaipur, Churu and Sri Ganganagar. Monsoon arrived Delhi on 15 June, almost two weeks earlier than its normal date.

The accumulated seasonal rainfall over the country as a whole during the period 1-29 June was 121% of its long period average.

5. Conditions over the equatorial Pacific and Indian Oceans

Since October 2007, La Niña conditions prevailed over the equatorial Pacific with colder than normal sea surface temperatures. Between February and April 2008, a gradual weakening of the La Niña event occurred. During the recent weeks, a rapid decay of the cold water including both surface and sub-surface was observed, indicating a possible end of the La Nina event. Climate model forecasts now suggest near-neutral conditions (with sea surface temperatures close to normal) are most likely to prevail during the next 2-3 months. However, some model forecasts suggest that conditions favourable for El Niño may be starting to emerge around September.

It is important to note that other factors like sea surface temperatures over the Indian Ocean also influence Indian monsoon rainfall in addition to El Niño and La Niña. A few climate models suggest possibility of the development of a positive Indian Ocean Dipole (IOD) Recent research studies suggest positive IOD events are favourable for good performance of Indian monsoon, especially during September. IMD is carefully monitoring the equatorial Pacific conditions and the possible evolution of Indian Ocean Dipole structure.

6. Summary of the forecasts for 2008 southwest monsoon rainfall

i) South-West Monsoon Season Rainfall

IMD's long range forecast update for the 2008 south-west monsoon season (June to September) is that the rainfall for the country as a whole is likely to be Near Normal. Quantitatively, monsoon season rainfall is likely to be 100% of the long period average with a model error of ±4%. The Long period average rainfall over the country as a whole for the period 1941-1990 is 89 cm.

ii) July rainfall

Rainfall over the country as a whole in the month of July 2008 is likely to be 98% of its LPA with a model error of ± 9 %.

iii) Rainfall over broad geographical regions

Over the four broad geographical regions of the country, rainfall for the 2008 South-West Monsoon Season is likely to be 96% of its LPA over North-West India, 101% of its LPA over North-East India, 101% of its LPA over Central India and 98% of its LPA over South Peninsula, all with a model error of ± 8 %.