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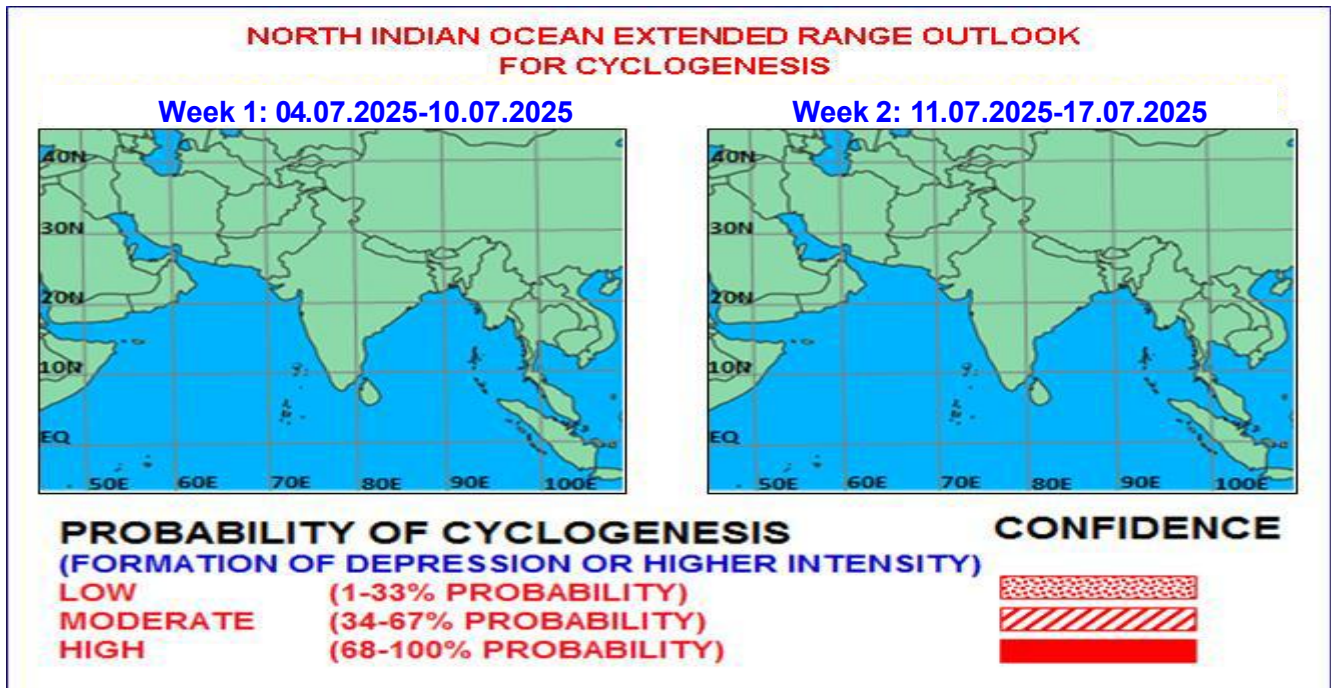


Fig. 1: Graphical Cyclogenesis over the north Indian Ocean during next two weeks

I. Environmental features:

The guidance from various models (ECMF, ECMM, NCEP, JMA) indicates that Madden-Julian Oscillation (MJO) is currently in phase 2 with an amplitude less than 1. The model forecasts indicate that the MJO is likely to make a loop in phase 2 during the first half of week 1, with the amplitude remaining less than 1. Thereafter, it is indicated to move eastwards across phases 3, 4, and 5 during the remaining days of the forecast period. The NCICS CFS model also indicates similar features. Hence, MJO is likely to contribute positively towards the enhancement of convective activity over the Bay of Bengal (BoB).

The guidance from the NCICS CFS model indicates the prevalence of westerly wind anomaly (5-7mps) over central & north Arabian Sea (AS), central India and north BoB along with easterly wind anomaly (5-7 mps) over northern parts of India and north Bay of Bengal during first half of week 1. During later half of week 1, there is a gradual decreasing trend in both easterly and westerly wind anomalies, and MJO is also indicated to progress eastwards. Thus, the conditions are favorable for the development of cyclonic circulation/ low pressure area over north BoB during the first half of week 1. During week 2, there is a significant decreasing trend in westerly wind anomaly over the region, indicating weakening of the lower-level monsoonal flow over the region.

II. Model Guidance:

The guidance from various Numerical models, including IMD GFS, NCEP-GFS, NCUM, ECMWF, and EC-AIFS indicates an existing upper-air cyclonic circulation over north Odisha adjoining Gangetic West Bengal (GWB). Although there are variations amongst model forecasts, as per consensus, the cyclonic circulation is likely to move slowly west-northwestwards across Jharkhand till 4th July, 2025, before it gets merged with the vertical extension of the seasonal monsoon trough. There is a likely development of another upper-air cyclonic circulation over the northwest BoB and adjoining West Bengal and Bangladesh around 6 July. According to a few model forecasts, under its influence, there is a likelihood for the formation of a low pressure area over the same region around 7th July. However, it is

likely to move west-northwestwards across GWB & adjoining north Odisha, Jharkhand and east Madhya Pradesh during the subsequent 3-4 days. If we consider the 10-day forecasts of the global model, there is no probability of cyclogenesis during the period over North Indian Ocean (NIO) region.

The 850 hPa mean wind field of IMD ERF Model indicates southwesterly winds over AS, central & south peninsular India and the entire BoB during both weeks. The model also indicates a seasonal monsoon trough in its normal position during week 1; however, the monsoon trough, especially its western end, is likely to shift towards the north during week 2. The 850 hPa wind anomaly field indicates anomalous cyclonic circulation over northwest AS with a north-south trough along the western part of AS during week 1. A weak cyclonic circulation over northwest BoB off Odisha coast is also indicated the wind anomaly field. There is a feeble east-west troughing developed across central AS during week 2. In the second week, the 850 hPa wind anomaly also indicates a cyclonic circulation over coastal Myanmar and the adjoining north Andaman Sea. The model is also indicating low to moderate (30-40 %) probability of cyclogenesis over the Gangetic plain in eastern parts of India during week 1. This is further reiterated by above normal rainfall activity over north BoB, central India, and northeast & adjoining central AS. However, there is no zone with a significant probability of cyclogenesis during week 2. The global ensemble model, as well as sub-seasonal forecasts of the ECMWF, do not suggest any significant probability of cyclogenesis during entire forecast period. Thus, guidance from various numerical models indicates likely formation of cyclonic circulation/ low pressure area over northwest BoB and adjoining areas of eastern parts of India, with good monsoon rainfall activity over India during week 1, and there is likely subdued monsoon activity over the Indian region.

III. Inference:

Considering various large-scale environmental features and model guidance, it is inferred that,

1. The existing upper-air cyclonic circulation over north Odisha adjoining Gangetic West Bengal is likely to persist for 24 hours with a slow west-northwestward movement.
2. There is a likelihood of the formation of another upper-air cyclonic circulation over North Bay of Bengal and adjoining coastal West Bengal & Bangladesh around 6th July. It is likely to move west-northwestwards across Gangetic West Bengal and adjoining north Odisha, Jharkhand, and east Madhya Pradesh during the subsequent 3-4 days. However, there is no likelihood of its further intensification.
3. There is no probability of cyclogenesis during week 2. However, there is a likely development of an upper-air cyclonic circulation over the north Bay of Bengal and adjoining coastal West Bengal-Odisha and Bangladesh during the week.

IV. Verification of forecast issued during the previous two weeks:

The forecast issued on 19th June for week 2 (27th June–03rd July) indicated that an upper-air cyclonic circulation over North BoB and adjoining West Bengal & Bangladesh towards end of week 1 (around 26th June). Under its influence, a low-pressure area was likely to form over the same region at the beginning of week 2 (around 27th June). However, it was not likely to intensify further into a depression.

The forecast issued on 26th June for the week 1 (27th June–03rd July) indicated that

1. The existing low-pressure area over northwest BoB and adjoining coastal areas of north Odisha and West Bengal was likely to move west-northwestwards across north Odisha & adjoining GWB during the next two days.
2. There was a likelihood of the formation of another low-pressure area over North Bay of Bengal and adjoining West Bengal & Bangladesh around 29th June. It was likely to move slowly west-northwestwards and become more marked by 30th June. There was a low probability for further intensification into a depression over GWB and neighborhood during the subsequent 24 hours.

Realized:

A low pressure area was formed over the coastal areas of north Odisha and West Bengal region at 0300 UTC on 26th June. It became less marked over north Odisha and adjoining GWB on 27th June 2025.

Another upper-air cyclonic circulation was formed over southwest Bangladesh & adjoining GWB on 28th June, 2025. Under its influence, a low-pressure area formed over Northwest BoB and adjoining West Bengal & Bangladesh coasts on 29th June. It moved inland over Jharkhand & neighborhood on 1st July and became less marked on 2nd July 2025.

Another upper air cyclonic circulation formed over Saurashtra & Kutch & adjoining northeast Arabian sea on 28th June and under its influence a low-pressure area formed over Kutch and neighborhood on the 28th June, 2025 and became less marked on 29th June, 2025.

Hence, the existing low-pressure area over northwest BoB and adjoining coastal areas of north Odisha moved over north Odisha and adjoining GWB on 27th June.

Likely formation of another low-pressure area over North BoB and adjoining West Bengal & Bangladesh was captured in week 1 forecast. However, it moved inland over Jharkhand & neighborhood on 1st July and became less marked on 02nd July 2025. It did not intensify further.

Therefore, the formation of an LPA was predicted well 2 weeks in advance.

NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from, 26th June to 02nd July, 2025 are presented in Fig. 2.

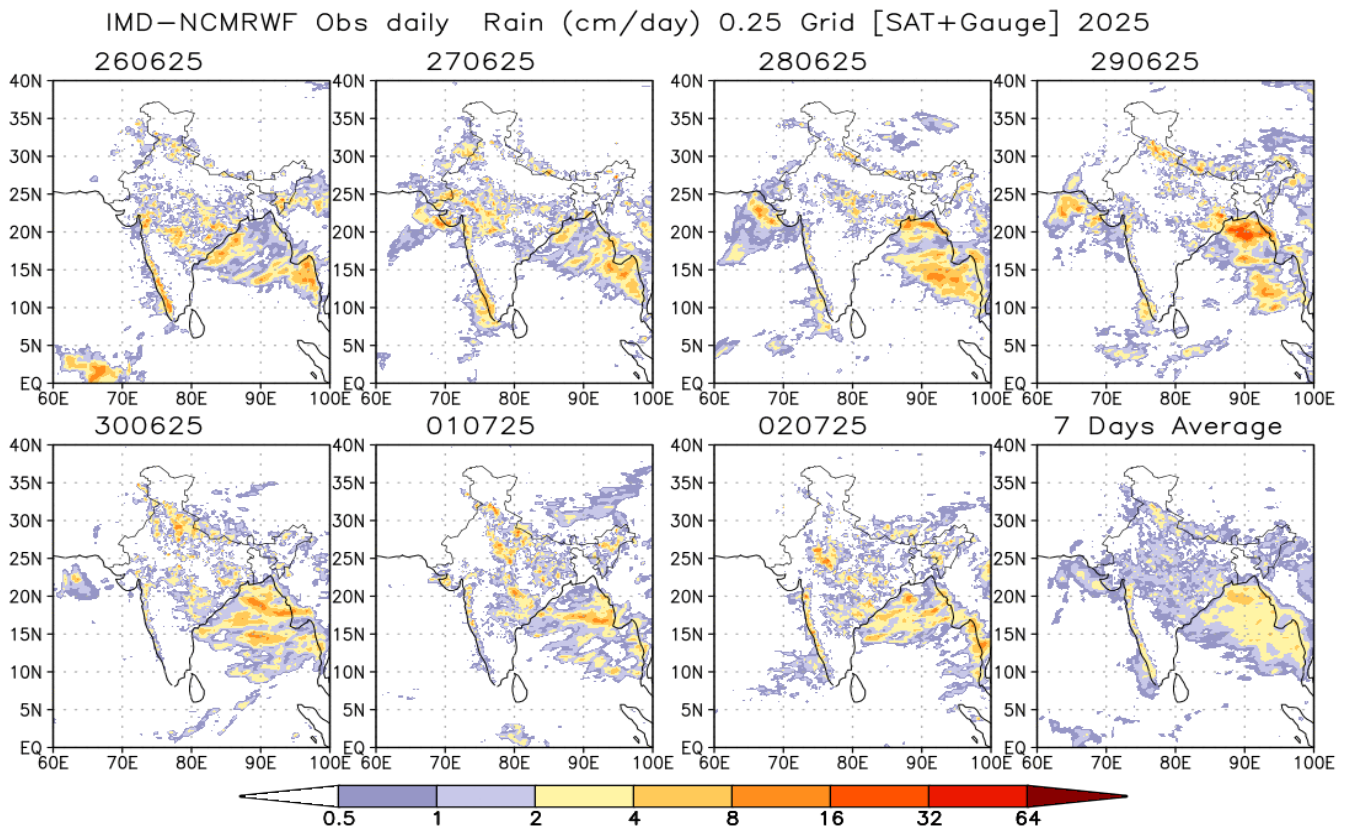


Fig.2: NCMRWF-IMD satellite gauge merged data plots of realized 24-hour accumulated rainfall from 26th June to 2nd July, 2025.

Legends: MJO: Madden Julian Oscillation, ERW: Equatorial Rossby Waves, KW: Kelvin Waves, NCICS: North Carolina Institute for Climate Studies (for Equatorial waves Forecast), IMD GFS: India Meteorological Department Global Forecast System, NCUM: National Centre for Medium-Range Weather Forecasting Centre (NCMRWF) Unified Model, ECMWF: European Centre for Medium-Range Weather Forecasting, EC-AIFS: ECMWF Artificial Intelligence Forecasting System, ECMM: ECMWF-Ensemble System Bias Corrected, GPP: Genesis Potential Parameter, NCEP GFS/GEFS/CFS: National Centre for Environment Prediction GFS/GEFSv12/CFSv2, CPC: Climate Prediction Center (for MJO update), IMD-GEFS: GFS ensemble forecast system of IMD, NEPS: NCUM ensemble prediction system, CNCUM: Coupled NCUM, CPC: Climate Prediction Centre, NWS: National Weather Service, INCOIS: Indian National Centre for Ocean Information Services.

Next update: 10.07.2025