India Meteorological Department
Ministry of Earth Sciences
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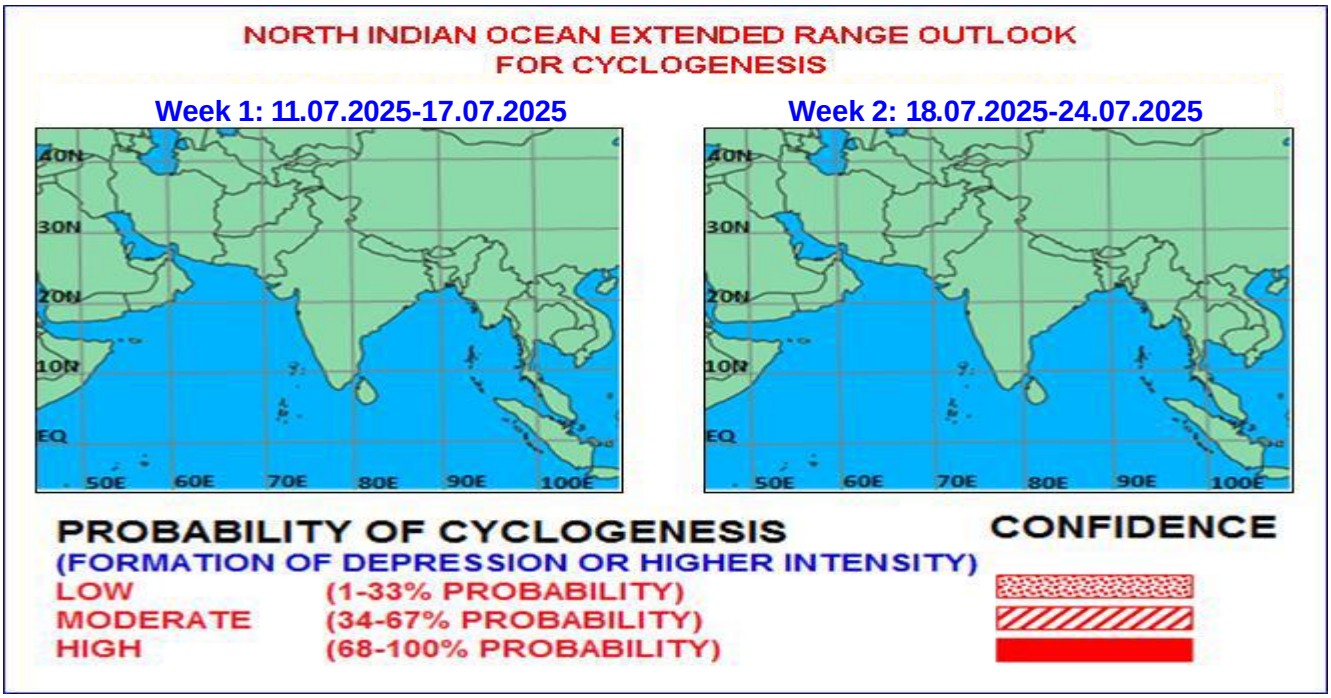

Fig. 1: Graphical Cyclogenesis over the north Indian Ocean during next two weeks

I. Environmental features:

The guidance from various models (ECMF, ECMM, EMON, NCEP, NCPE) indicates that Madden-Julian Oscillation (MJO) is currently in phase 4 with an amplitude greater than 1. Most of the model forecasts have a consensus and suggest that the MJO signal is likely to make a loop in phase 4 during the first half of week 1, with the amplitude remaining close to 1. Thereafter, it is likely to propagate eastwards across phases 5 and 6 with its amplitude greater than 1 during the remaining days of the forecast period. Hence, MJO is likely to support the enhancement of convective activity over the Bay of Bengal (BoB) region during the first week.

The guidance from the NCICS CFS model indicates the prevalence of weak westerly wind anomaly (1-3 mps) over the south and central Arabian Sea (AS) in the first half of week 1. It is likely to become stronger (5-7 mps) from the southern part of AS gradually towards central AS from the later part of the week. The strong westerly anomaly (5-7 mps) is likely to develop over the North equatorial Indian Ocean (NEIO) and adjoining south AS and gradually over south BoB during the second week. Easterly wind anomaly is likely to prevail over central BoB, extending up to the central & peninsular India during both weeks with gradual strengthening. The Equatorial Rossby Wave (ERW) is likely to be noticed over south BoB and adjoining NEIO during the first half the week 1. Thereafter, ERW is likely to propagate westwards across the south BoB and southeast AS during the remaining days. The low-frequency waves are likely to persist over southwest BoB and adjoining southeast AS and NEIO during the entire forecast period.

II. Model Guidance:

The guidance from various Numerical models, including IMD GFS, NCEP-GFS, NCUM, ECMWF, and EC-AIFS indicates an existing low pressure area over south Jharkhand & neighborhood, which is likely to remain nearly stationary over the same region before it is merged with the eastern end of the seasonal monsoon trough during the next 48 hours. Although there are variations amongst model

forecasts, as per consensus, the associated upper air cyclonic circulation is likely to merge with the vertical extension of the seasonal monsoon trough. As per IMD GFS and Bharat Forecast System (BFS) there is a likely development of another upper-air cyclonic circulation over the north BoB and adjoining West Bengal and Bangladesh around 18th July. But NCEP-GFS and ECMWF indicate the development of the upper air cyclonic circulation over northwest BoB off Odisha coast during the beginning of week 2. it is likely to move west-northwestwards across GWB & adjoining north Odisha, Jharkhand and east Madhya Pradesh during the later part of week 2. Thus, if we consider the 10-day forecasts of the global models, 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 cyclonic circulation over coastal areas of Odisha and West Bengal during week 1, which persists over the same regions during week 2. 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 the cyclonic circulation over the east-central AS along with northeasterly flow covering the rest of the AS. There is also a northeasterly wind anomaly over BoB as well. In the second week, the 850 hPa wind anomaly also indicates an east-west trough extending across the southern part of the Arabian Sea, south peninsular India up to the Andaman Sea. The north-easterly wind anomaly is likely to persist during the second week as well. This illustrates that the monsoon activity will be below normal over most parts of India except the central parts of India.

The model is also indicating a low to moderate probability of cyclogenesis over the land region covering east India and adjoining Gangetic plains during week 1. 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 except the low probability of cyclogenesis over north BoB at the end of week 2. Thus, guidance from various numerical models indicates that the existing low pressure area/ upper air cyclonic circulation is likely to persist over east India during next 2-days. Another fresh upper air cyclonic circulation is likely to develop over northwest BoB around 18th July.

III. Inference:

Considering various large-scale environmental features and model guidance, it is inferred that, there is no probability of cyclogenesis during week 1 & 2. However,

1. the existing low pressure area over south Jharkhand and neighbourhood is likely to remain over the same region during next 24 hours. However, the associated upper-air cyclonic circulation is likely to persist for subsequent 2 days.
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 18th July. It is likely to move slowly west-northwestwards across Gangetic West Bengal, north Odisha & adjoining Jharkhand, and south Chhattisgarh during the subsequent 2-3 days. However, there is no likelihood of its further intensification.

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

The forecast issued on 26th June for week 2 (04th -10th July) indicated that there is no probability of cyclogenesis over the North Indian Ocean region during week 2. However, an upper-air cyclonic circulation/low pressure area is likely to form over the north Bay of Bengal and move west-northwestwards during the week.

The forecast issued on 03rd July for the week 1 (04th -10th July) indicated 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.

Realized:

The existing upper-air cyclonic circulation over north Odisha & adjoining Gangetic West Bengal (GWB) moved slowly west-northwestward (WNW) and lay over northern parts of GWB at 0000 UTC of 04th July. Under its influence **a low-pressure area** formed over GWB & neighbourhood at 0300 UTC of 06th July. It persisted and lay over southwest GWB & neighborhood at 0300 UTC of 07th July. It further moved west-northwestwards and lay over GWB & adjoining Jharkhand at 0300 UTC of 09th July and over south Jharkhand & neighbourhood at 0300 UTC of today, the 10th July.

Hence, the development of an upper-air cyclonic circulation over north Odisha & adjoining GWB region was predicted well two weeks in advance. However, the formation of a low pressure area under the influence of the cyclonic circulation mentioned above was not suggested in the extended-range outlook.

NCMRWF-IMD satellite gauge merged data plots of realized 24-hour accumulated rainfall from, 03rd to 9th July, 2025 are presented in Fig. 2.

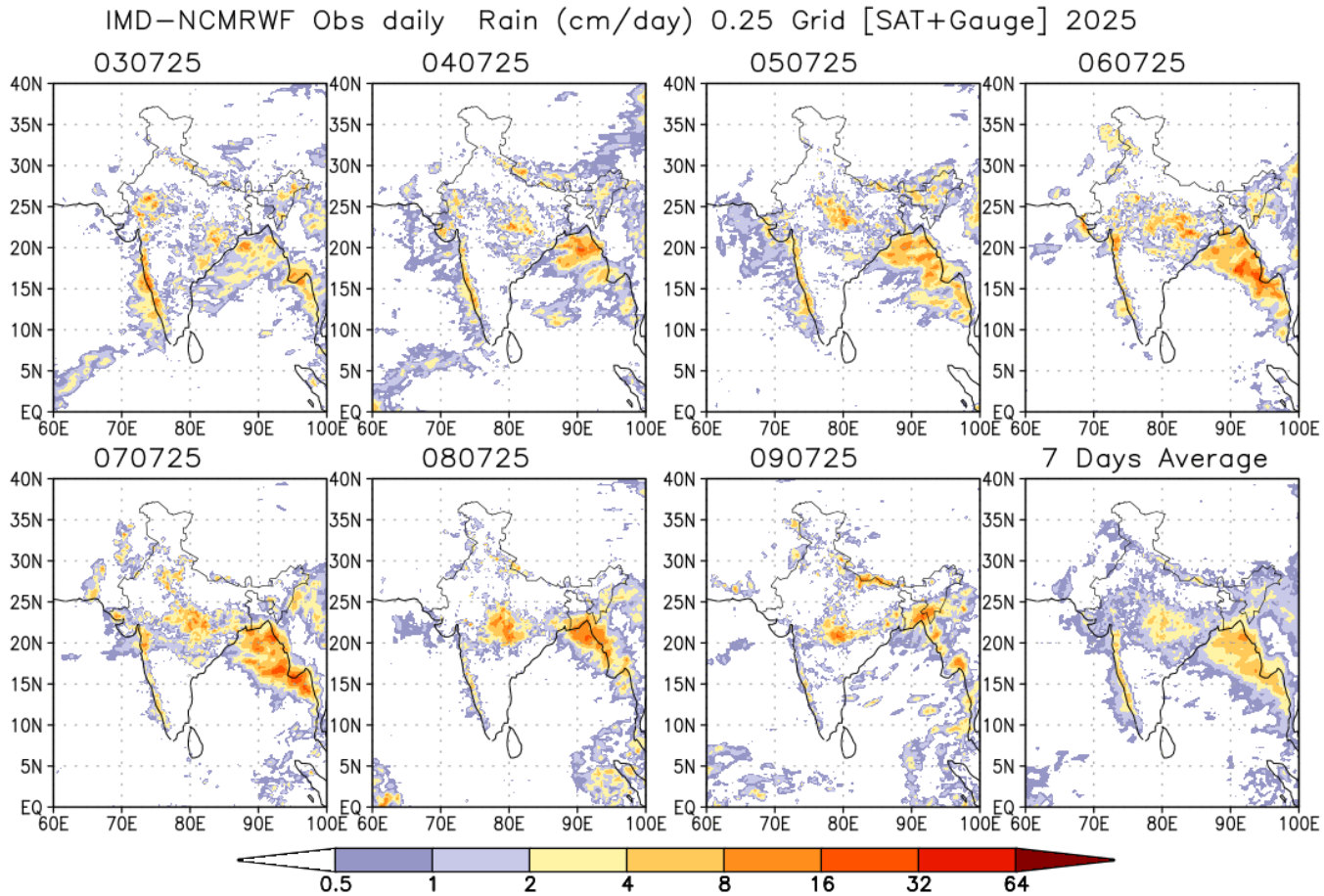

Fig.2: NCMRWF-IMD satellite gauge merged data plots of realized 24-hour accumulated rainfall from 3rd to 9th July, 2025.

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: 17.07.2025