

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

#### **I. Environmental features:**

As per ECMWF bias corrected ensemble prediction system (EPS) and most of the MJO Prediction EPS indicate that the Madden–Julian Oscillation (MJO) Index is currently in Phase 1 with amplitude less than 1. It would move across phases 2, 3 and 4 during remaining days of the week 1 with decreasing amplitude. Thereafter, it is likely to remain in phase 4 or 5 with gradually increasing amplitude but less than 1 during week 2. Hence MJO phase is supportive for enhancement of convective activity over the North Indian Ocean during the entire period of forecast. While the amplitude is not favourable during week 1 and likely to become gradually favourable during week 2. There is large spread among the members of different EPS, indicating a low confidence in the mean guidance of EPS.

NCICS based forecast for equatorial waves over the region indicates presence of weak easterly winds (1-3 mps) over South Bay of Bengal (BoB) & adjoining Equatorial Indian Ocean (EIO) during week 1 and westerly winds with Equatorial Rossby Waves (ERW) over North BoB. During week 2, weak easterlies are likely over south BoB. These features indicate weak monsoon condition over the BoB during next two weeks. Over the Arabian Sea (AS), it indicates presence of westerly winds (1-2 mps) over North AS, easterly inds (1-3 mps) over South AS alongwith ERW over southeast AS. During week 2, westerly winds (3-5 mps) alongwith MJO waves are likely over south AS. Thus, equatorial waves are not likely to support cyclogenesis over the AS and BoB during the entire forecast period.

#### **II. Model Guidance:**

IMD GFS and NCEP GFS are indicating a cyclonic circulation over the north BoB on 3<sup>rd</sup> September. NCUM is indicating development of a cyclonic circulation over northeast BoB on 2<sup>nd</sup> with north-northwestwards movement. The GPP is indicating a feeble potential zone for cyclogenesis over Northeast BoB during end of week 1 (around 31<sup>st</sup> August). The extended range model IMD CFS (V2) is indicating existing a fresh cyclonic circulation over North Bay of Bengal during first half of week 2 (around 3<sup>rd</sup> September).

**Legends:** 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, European Centre for Medium Range Weather Forecasting, GPP: Genesis Potential Parameter, National Centre for

Environment Prediction GFS, ECMM: ECMWF multi model, GEFS: GFS ensemble, NEPS: NCUM ensemble prediction system, CNCUM: Coupled NCUM, CPC: Climate Prediction Center, NWS: National Weather Service).

### III. Inference:

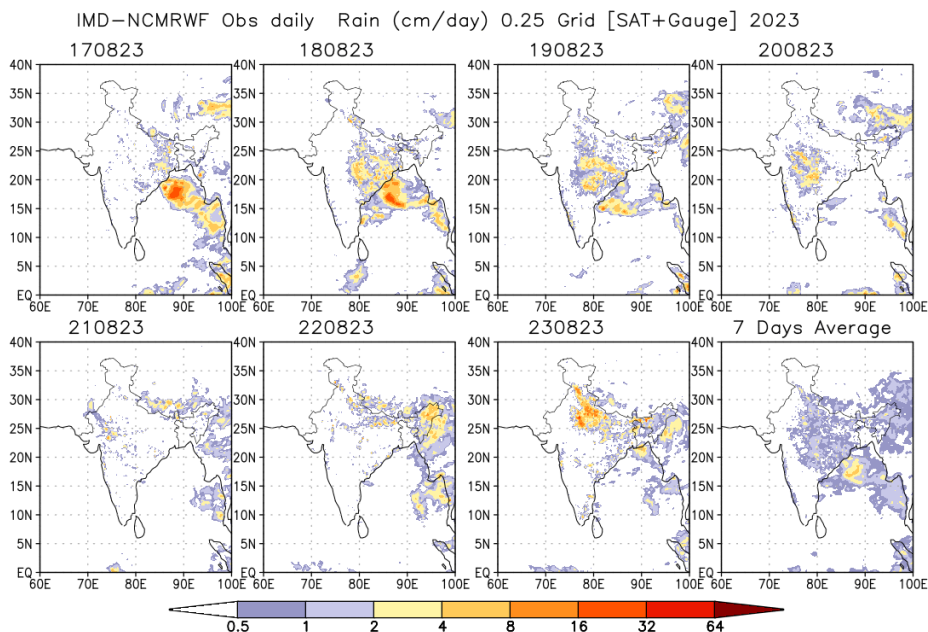
Considering all the above it is inferred that:

- (i) There is likelihood of development of a cyclonic circulation over North Bay of Bengal during first half of week 2.
- (ii) However, probability of cyclogenesis (formation of depression) may be treated as NIL over the North Indian Ocean during both the weeks (**Fig.1**).

### IV. Verification of forecast issued during last two weeks:

The forecast issued on 10<sup>rd</sup> August for week 2 (18.08.2023-24.08.2023) indicated moderate probability of formation of a fresh cyclonic circulation over Northwest Bay of Bengal off Gangetic West Bengal & Bangladesh in the beginning of week 2 (around 18<sup>th</sup> August) and likely development of a cyclonic circulation over northwest Bay of Bengal towards end of week 2 (around 23<sup>rd</sup> August). The forecast issued on 17<sup>th</sup> August for week 1 (18.08.2023-24.08.2023) indicated westnorthwestwards movement of the existing low pressure area over northwest Bay of Bengal across Odisha and Chhattisgarh during the first half of week 1. Actually, a low pressure area formed over northwest Bay of Bengal & neighbourhood on 18<sup>th</sup> and moved west-northwestwards across Odisha, Chhattisgarh. It became less marked and lay as a cyclonic circulation over Madhya Pradesh on 21<sup>st</sup> August. Thereafter, it moved towards Uttar Pradesh on 23<sup>rd</sup> August. Thus, the likely formation of low pressure area over North Bay of Bengal could be predicted correctly with some spatial and temporal displacements, two weeks in advance. Also, NIL cyclogenesis (formation of depression) was correctly predicted two weeks in advance.

The IMD-NCMRWF satellite-gauge merged data plots during 10<sup>th</sup> august-16<sup>th</sup> august are presented in **Fig. 2**.



**Fig.2: IMD-NCMRWF satellite-gauge merged data plots during 17<sup>th</sup> -23<sup>th</sup> August, 2023**