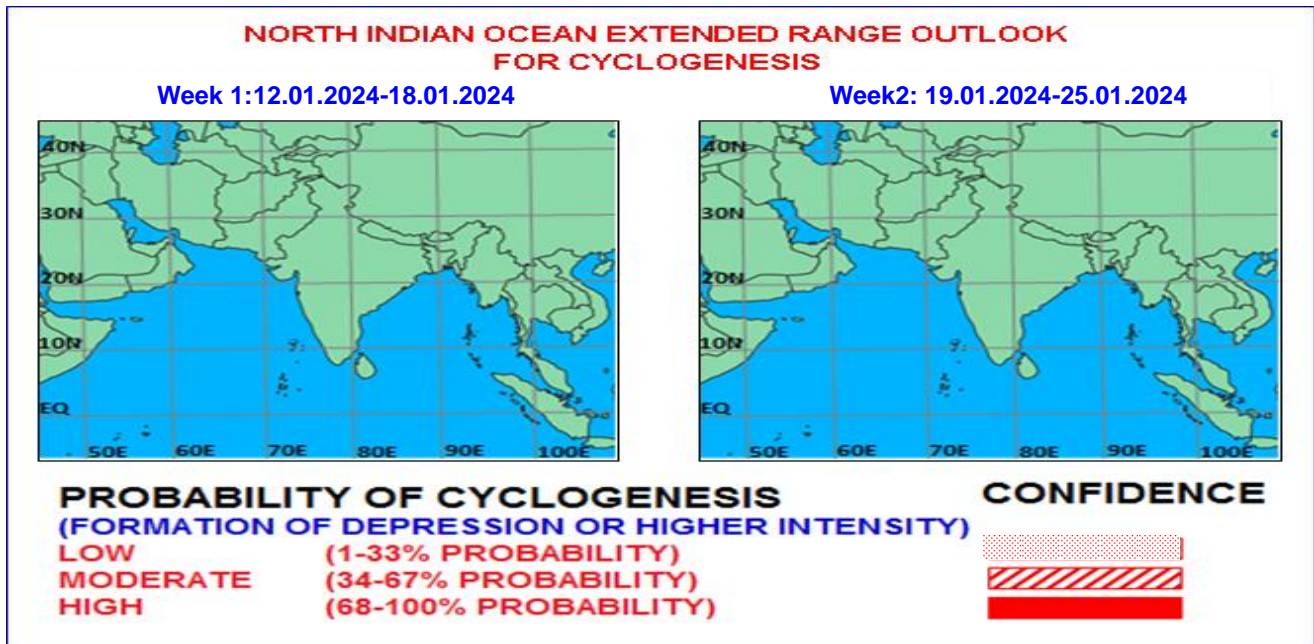




Issued on 11.01.2024



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

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

Madden Julian Oscillation (MJO) index is currently again in phase 3 (Indian Ocean) with amplitude greater than 1 after a short looping over phase 2. The GEFS and ECMWF both forecasts are in agreement NS suggest that MJO index is likely to remain in phase 3 during next 2-3 days. Thereafter, it is likely to enter into phase 4 with gradually increasing amplitude and would remain in the same phase during the rest part of first week. Both the models are showing slight variation in the MJO forecast for second week. GEFS forecast indicated slow eastward propagation and entering phase 5 in the second half for the week 2. Whereas ECMWF forecast suggests a rather faster eastward propagation reaching phase 6 moving across phase 5 at the end of second week. As, GEFS model has larger spread amongst members compared to ECMWF model there is a high probability for the MJO to migrate from phase 4 to phase 6 during the second week. Considering the forecast scenario, MJO is likely to support the convection over Bay of Bengal (BoB) during the first half of the week and likely to be neutral over BoB after first half of week 1 and over Arabian Sea (AS) during entire forecast period.

NCICS based forecast for equatorial waves indicates easterly winds (3 - 9 mps) over south BoB during initial 3 days of first week. The easterly winds are also likely over entire AS during the same period. The strong easterly winds is likely to disappear gradually from northern parts of BoB during the end of week 1 and from entire BOB during week 2. In the forecast, easterly winds are not indicated over eastern part of AS during week 2 whereas weak easterly winds are likely to prevail over western side of AS. During first week, Equatorial Rossby Wave (ERW) activity is likely over entire BoB. ERW is likely to fade from the region in the second week when it is likely to shift towards Equatorial Indian Ocean (EIO) of southern hemisphere. Kelvin Waves are likely to be absent over the region nearly throughout the entire forecast period and make an entry over southwest & westcentral AS at the later part of

second week. The wind pattern along with wave activity is likely to favour convective activity over BoB during first week only.

## **II. Model Guidance:**

IMD GFS, GEFS, NCUM, ECMWF and NCEP GFS models are not indicating prominent convective activity over Both the basins during next 10 days. Light to moderate rainfall activity is likely due to the feeble easterly waves over the region during the first week. Light to moderate rainfall activity is likely over north BoB and adjoining coastal areas due to the induced effects (formation of trough and upper air cyclonic circulation) of eastward propagating upper level trough in westerlies. All models are indicating that due to the presence of anticyclone in the lower tropospheric levels over Jharkhand & Odisha and adjoining areas of East India, easterly/northeasterly winds would prevail over westcentral, southwest BoB and adjoining Andhra Pradesh and Tamil Nadu coasts during first half of week 1. Thereafter, the anticyclone is likely to shift over BoB region and trough in easterlies is likely to have impact over peninsular region during later part of the week 1.

Both the mean wind field in extended range (CFS V2) forecast of IMD indicated nearly similar circulation pattern over the region during next two weeks. An anticyclone is likely to persist over central India and easterly flow over south AS and BoB. Only in the second week, the anticyclone is likely to shift towards east which is likely to establish a north-south trough along over coastal region of south Gujarat and coastal Maharashtra. Anomaly wind field of week 1 indicated a cyclonic circulation over northeast BoB off Myanmar coast and an anticyclone over AS with westerly flow over South BoB and easterly over south AS. During week 2, the wind anomaly portrayed a cyclonic circulation over Odisha and adjoining east India along with an associated trough extending upto another cyclonic circulation over Gujarat coast. The wind anomaly depicted a wind reversal from easterly to westerly over south AS. The model is indicating a low to moderate (20-40%) probability of cyclogenesis over south AS and adjoining west EIO but no significant probability over BoB region during first week. The model did not indicate any probability of cyclogenesis over entire NIO during week 2. Extended range forecasts of ECMWF did not indicate any probability of cyclogenesis over North Indian Ocean region during the entire forecast period.

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

## **III. Inference:**

Considering all the environmental conditions and model guidance, it is inferred that there is no probability of cyclogenesis over the North Indian Ocean during the entire forecast period.

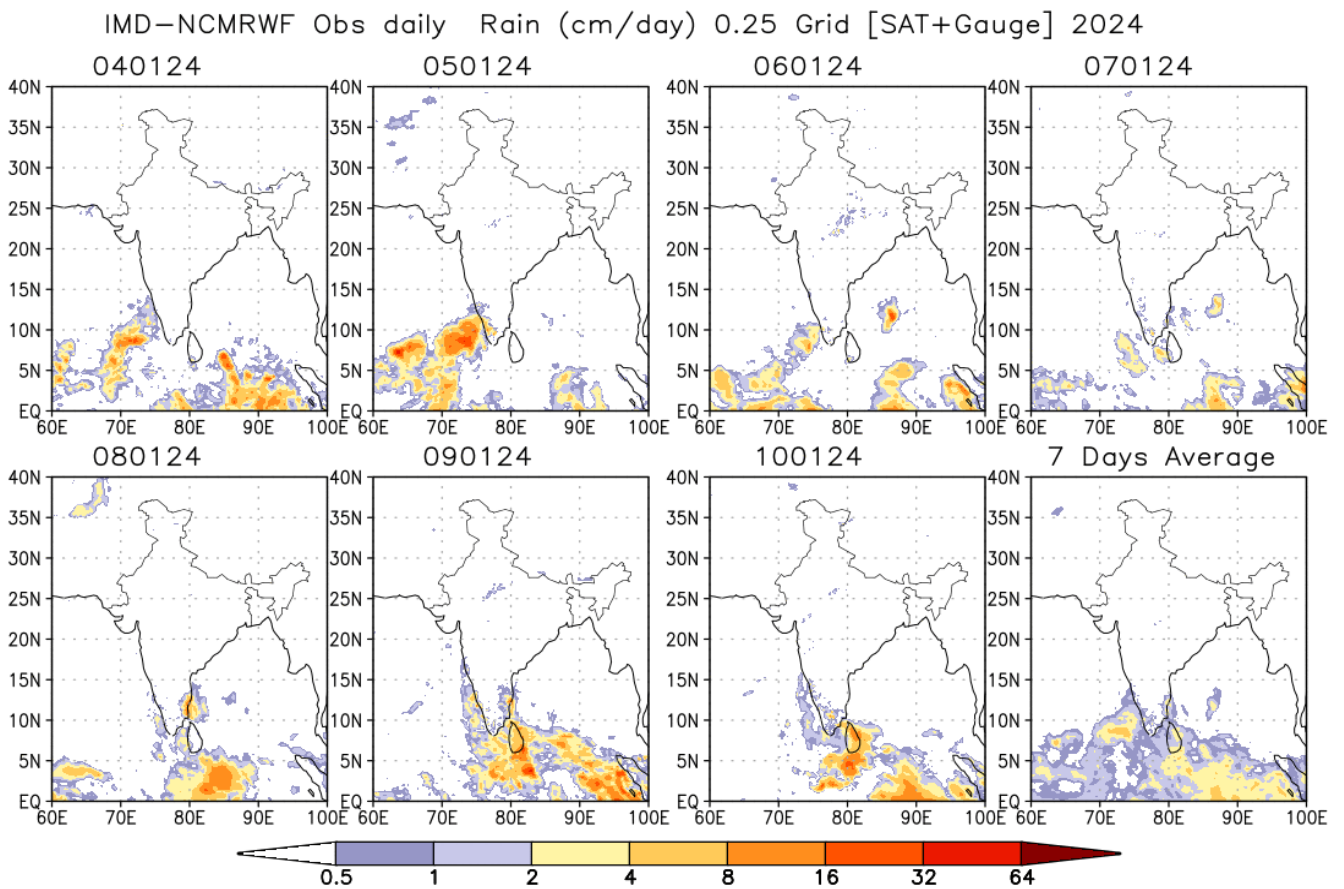
## **IV. Verification of forecast issued during last two weeks:**

Forecast issued on 28<sup>th</sup> December for week 2 (05.01.2024-11.01.2024) indicated cyclonic circulation/low pressure area over south Bay of Bengal and Equatorial Indian Ocean in the end of week1/ beginning of week 2 which was likely to move westwards.

and forecast issued on 04th January for week 1 (05.01.2024-11.01.2024) predicted likelihood of formation of a cyclonic circulation/low pressure area over southeast Arabian Sea and adjoining west Equatorial Indian Ocean during week 1.

Actually, an upper air cyclonic circulation was lay over Southeast Arabian Sea & adjoining Lakshadweep Area at 0300 UTC of 06th January 2024. It became less marked on 11<sup>th</sup> January 2024 near Kerala coast. Therefore, the formation of cyclonic circulation/low pressure area over Southeast Arabian Sea was correctly predicted in the extended range forecast.

NCMRWF-IMD satellite gauge merged data plots of 24 hours accumulated realized rainfall during 04th January, 2024 to 10th January, 2024 are presented in Fig.2.



**Fig.2: NCMRWF-IMD satellite gauge merged data plots of 24 hours accumulated realized rainfall during 04<sup>th</sup> January, 2024 to 10<sup>th</sup> January, 2024.**

**Next update: 18.01.2024**