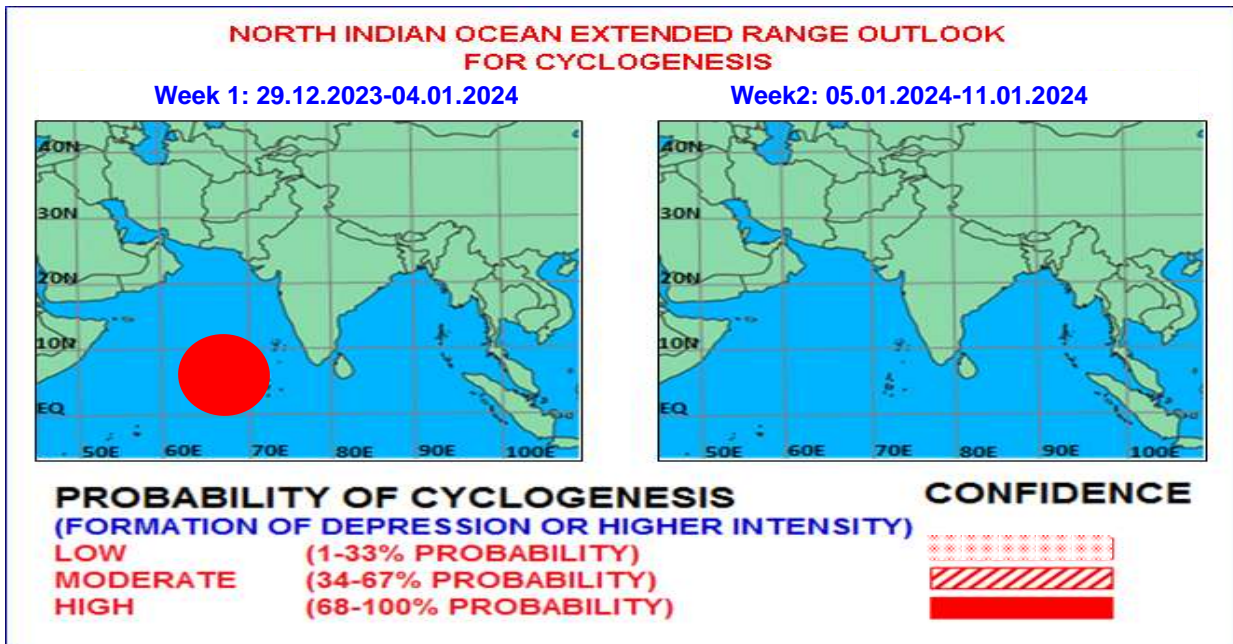




Issued on 28.12.2023



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

**I. Environmental features:**

Madden Julian Oscillation (MJO) index is currently in phase 1 with amplitude greater than 1. It would move into phase 2 from 29<sup>th</sup> December and phase 3 from 3<sup>rd</sup> January, 2024 with amplitude remaining more than 1. Thus, MJO would support enhancement of convective activity over the Arabian Sea (AS) during week 1 and over the Bay of Bengal (BoB) during week 2.

NCICS based forecast for equatorial waves indicates easterly winds (3-5 mps) over both the basins during first half of week 1. During 2<sup>nd</sup> half of week 1, strong westerly winds (9 mps) alongwith Kelvin Waves (KW), Equatorial Rossby Waves (ERW) and MJO waves over south AS and easterly winds (1-3 mps) over central AS are likely to prevail. Similar situation is likely to continue during first half of week 2. During later half of week 2, strong westerly winds (5-7 mps) alongwith MJO over south BoB and easterly winds (3-5 mps) over central BoB are likely to prevail. Thus, equatorial waves are likely to contribute to cyclogenesis over south Arabian Sea during later half of week 1 and beginning of week 2. Similarly, during later half of week 2, equatorial waves may contribute to cyclogenesis over south BoB.

**Model Guidance:**

IMD GFS, GEFS and NCEP GFS are indicating development of a cyclonic circulation over southeast Arabian Sea around 30<sup>th</sup> December, with gradual intensification into a low pressure area over southeast and adjoining southwest Arabian Sea around 1<sup>st</sup> January, 2024. These models are indicating the system to move over southeast and adjoining central Arabian Sea till 5<sup>th</sup> January and become less marked thereafter. ECMWF is indicating low pressure area over southeast Arabian Sea around 1<sup>st</sup> January. It is also indicating a low pressure area over southwest Bay of Bengal around 2<sup>nd</sup> January. However, no further intensification is indicated. NCUM is indicating a cyclonic circulation over southwest Arabian Sea on 2<sup>nd</sup> January with nearly westwards movement and no intensification. It is also indicating a cyclonic circulation over southwest Bay of Bengal & adjoining Equatorial Indian Ocean (EIO) on 4<sup>th</sup> December with gradual westwards movement. Most of the deterministic models

are indicating formation of cyclonic circulation over southeast Arabian Sea around 30<sup>th</sup> December with likely intensification into a low pressure area around 1<sup>st</sup> January. No further intensification is indicated. Some models are also indicating development of a cyclonic circulation over southwest Bay of Bengal & adjoining EIO around 3<sup>rd</sup> January with gradual westwards movement and no intensification further. The extended range model IMD CFS V2 is indicating cyclonic circulation over southeast Arabian Sea and adjoining equatorial Indian Ocean in week 1. It is also indicating 30-40% probability of cyclogenesis over southeast AS and adjoining EIO during week 1. It is also indicating 20-30% probability of cyclogenesis over South BoB during week 1 and 2.

**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.

**II. Inference:**

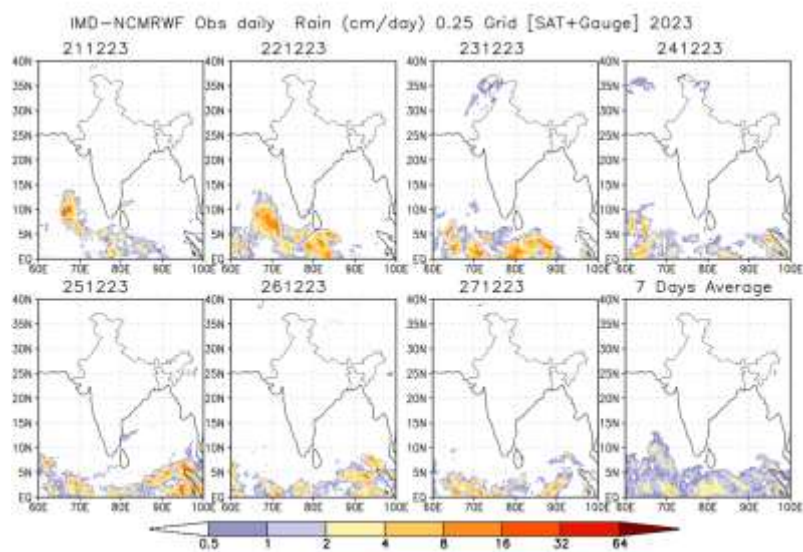
Considering all the environmental conditions and model guidance, it is inferred that there is

- (i) likelihood of formation of a cyclonic circulation over southeast Arabian Sea/low pressure area during middle of week 1. There is low probability of cyclogenesis over the south Arabian Sea during later half of week 1.
- (ii) likelihood of formation of a cyclonic circulation/low pressure area over south Bay of Bengal and Equatorial Indian Ocean in the end of week1/ beginning of week 2 which is likely to move westwards

**III. Verification of forecast issued during last two weeks:**

Forecast issued on 14<sup>th</sup> December for week 2 (22.12.2023-28.12.2023) and forecast issued on 21<sup>st</sup> December for week 1 (22.12.2023-28.12.2023) indicated no cyclogenesis over the North Indian Ocean during the period. No cyclogenesis occurred over the region during the week period.

NCMRWF-IMD satellite gauge merged data plots of 24 hours accumulated realized rainfall during 21<sup>st</sup> to 27<sup>th</sup> December, 2023 are presented in Fig.2.



**Fig.2: NCMRWF-IMD satellite gauge merged data plots of 24 hours accumulated realized rainfall during 21<sup>st</sup> to 27<sup>th</sup> December, 2023.**

**Next update: 04.01.2024**