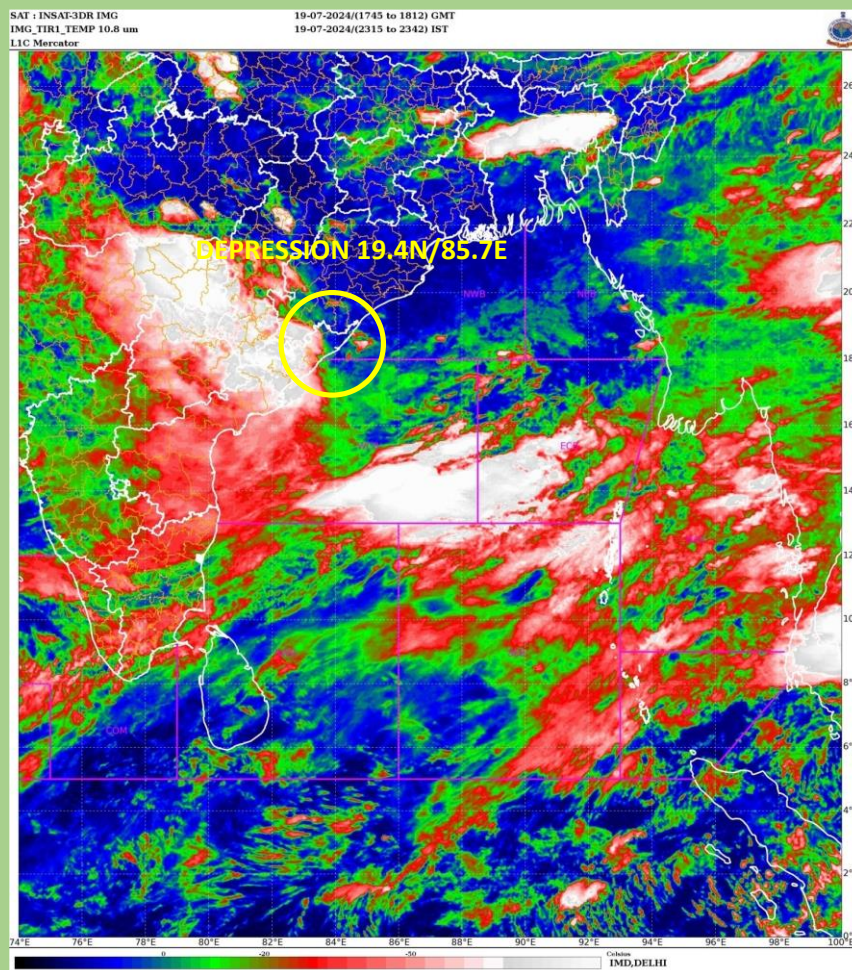




**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
INDIA METEOROLOGICAL DEPARTMENT**

**Depression over Northwest and adjoining Westcentral Bay of Bengal off
Odisha and adjoining North Andhra Pradesh coasts: A Report**

**INSAT-3D Satellite imagery of Depression over Northeast & adjoining Westcentral Bay of Bengal
at 1800 UTC of 19th July, 2024**



**Cyclone Warning Division
India Meteorological Department
New Delhi
July, 2024**

Depression over Northwest and adjoining Westcentral Bay of Bengal off Odisha and adjoining North Andhra Pradesh coasts during 19th July-20th July 2024

1. Introduction

- A low-pressure area formed over central and adjoining north Bay of Bengal (BoB) with associated cyclonic circulation extending upto mid-tropospheric levels tilting southwestwards with height in the morning (0830 hours IST) of 18th July, 2024.
- It lay as a well marked low pressure area over central and adjoining north BoB in the evening (1730 hours IST/1200 UTC) of 18th July, 2024.
- It moved northwestwards and concentrated into a depression over northwest and adjoining westcentral BoB off Odisha and adjoining north Andhra Pradesh coasts in the morning (0830 hours IST) of 19th July, 2024. Continuing to move further northwestwards, it lay centered at 1130 hours IST of 19th July, 2024 over the same region near latitude 19.3°N and longitude 86.1°E, about 60 km south-southeast of Puri (Odisha), 130 km East of Gopalpur (Odisha), 130 km south-southwest of Paradip (Odisha) and 230 km east-northeast of Kalingapatnam (Andhra Pradesh).
- Depression further moved west-northwestwards and lay centered at 0830 hours IST of 20th July, 2024 over the same region at latitude 19.6°N and longitude 85.4°E, about 40 km south-southwest of Puri (Odisha) and 70 km East-Northeast of Gopalpur (Odisha). It moved northwestwards, crossed Odisha coast near Chilika during 0830-0930 IST and weakened into a well-marked low pressure area over coastal Odisha in the same evening (1730 hours IST/1200 UTC of 20th July, 2024). It further moved northwestwards and lay over Odisha and adjoining Chhattisgarh in the morning (0830 hours IST/0300 UTC) of 21st July 2024.
- The observed track of the system is presented in Fig. 1. The best track parameters of the system are presented in Table 1.

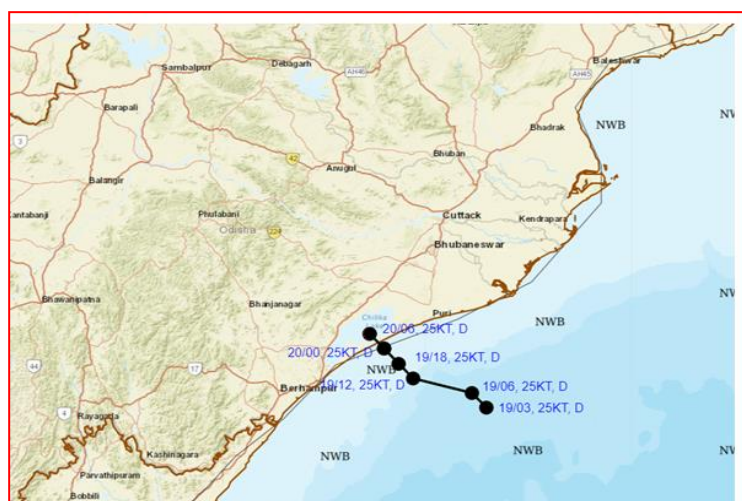


Fig. 1: Observed track of Depression over Northwest and adjoining Westcentral Bay of Bengal during 19th July-20th July 2024

Table1: Best track positions and other parameters of the Depression over Northwest and adjoining Westcentral Bay of Bengal during 19th July-20th July 2024

| Date | Time (UTC) | lat | lon | CI No | ECP | MSW (kt) | Category |
|----------|------------|--|------|-------|-----|----------|----------|
| 19.07.24 | 0300 | 19.1 | 86.2 | 1.5 | 992 | 25 | D |
| | 0600 | 19.2 | 86.0 | 1.5 | 992 | 25 | D |
| | 1200 | 19.4 | 85.7 | 1.5 | 990 | 25 | D |
| | 1800 | 19.5 | 85.6 | 1.5 | 990 | 25 | D |
| 20.07.24 | 0000 | 19.6 | 85.5 | 1.5 | 991 | 25 | D |
| | 0300 | 19.6 | 85.5 | 1.5 | 992 | 25 | D |
| | | Crossed Odisha coast near Chilika during 0830-0930 IST | | | | | |
| | 0600 | 19.7 | 85.4 | 1.5 | 992 | 25 | D |
| | 1200 | Depression weakened into a Well Marked Low Pressure Area over Coastal Odisha | | | | | |

KT: Knots (nautical mile per hour), 1 KT=1.85 kmph, D: Depression, DD: Deep Depression

2. Salient features of the system

- The life period of the system was 1 day and 9 hours which is below normal for depressions over BoB during monsoon season.
- First depression of monsoon season
- Climatologically about two depressions form over the BoB in July

3. Brief life history - Genesis Intensification and movement

3.1 Genesis

A low-pressure area formed over central and adjoining north Bay of Bengal (BoB) with associated cyclonic circulation extending upto mid-tropospheric levels tilting southwestwards in the morning (0830 hours IST/0300 UTC) of 18th July, 2024.

It lay as a well-marked low-pressure area over central and adjoining north Bay of Bengal in the evening (1730 hours IST) of 18th July, 2024.

It moved northwestwards and concentrated into a depression over northwest and adjoining westcentral BoB off Odisha and adjoining north Andhra Pradesh coasts in the morning (0830 hours IST/0300 UTC) of 19th July, 2024.

The Madden Julian Oscillation (MJO) index was located in phase 5 with amplitude more than 1 and remained in same phase for next 2 days. Thus, MJO phase and its amplitude was favourable for enhancement of convective activity over the north BoB. The NCICS based forecasts for zonal winds indicate strong easterly winds (~ 3 to 7 mps) over north BoB and adjoining central India and strong westerly winds (~ 3 to 7

mps) over the southern and adjoining eastcentral part of BoB. Additionally, there existed an Equatorial Rossby Wave (ERW). Thus, zonal winds and equatorial waves contributed to formation of depression over north BoB on 19th July. Low level vorticity was about $120 \times 10^{-6} \text{S}^{-1}$ around the system centre over westcentral & adjoining northeastcentral BoB with vertical extension upto 700 hpa levels. Low level convergence was east-west oriented and was about $10\text{-}15 \times 10^{-6} \text{S}^{-1}$ to the west of the system center. Upper level divergence is also east-west oriented and is about $10\text{-}20 \times 10^{-6} \text{S}^{-1}$ around the system center. Vertical wind shear (VWS) was low to moderate (10-15 kt) near the system center.

3.2 Intensification and movement

At 0300 UTC of 20th July, the depression has moved northwestwards lay over the same region.

The low-level vorticity has decreased approximately to $75 \times 10^{-6} \text{S}^{-1}$ over the northwest and adjoining west central Bay of Bengal, and over the east of the system center. The vertical extension was up to 200 hPa level, the low-level convergence is circular, measuring about $20 \times 10^{-6} \text{S}^{-1}$ around the system center. Moreover, upper-level divergence was about $10 \times 10^{-6} \text{s}^{-1}$ to the southwest of the system center. It has to be noted that the VWS was very high, ranging from 40-50 KT over the area. Under these circumstances, it did not intensify further and crossed coast as a depression.

4. Monitoring

India Meteorological Department (IMD) maintained round the clock watch over the north Indian Ocean (NIO) and the system was monitored well in advance since 15th July. The system was monitored with the help of available satellite observations from INSAT 3D and 3DR, polar orbiting satellites, available ships & buoy observations in the region and coastal observations on the day of landfall. Various numerical weather prediction models run by Ministry of Earth Sciences (MoES) institutions, global models and dynamical-statistical models were utilized to predict the genesis, track, landfall and intensity of the system. A digitized forecasting system of IMD was utilized for analysis and comparison of various models' guidance, decision making process and warning products generation.

4.1. Features observed through satellite

Satellite monitoring of the system was mainly done by using half hourly INSAT-3D and 3DR imageries. Satellite imageries of other international geostationary satellites, high resolution polar orbiting satellites and scatterometer imageries from ASCAT were also considered for monitoring of the system. Typical INSAT-3D enhanced colored imageries, visible/ IR, brightness temperature and water vapour imageries are presented in **Fig.2 (a) to 2 (d)**. During the entire life cycle, the clouds were

organized in shear pattern. The detailed features from the satellite pictures are discussed in this section.

At 0300 UTC of 19th July, based on INSAT-3D imagery, the convection has organized, and the intensity of the system was C.I.1.5. There were scattered to broken low and medium clouds with embedded intense to very intense convection over the northwest and adjoining west central Bay of Bengal, as well as the north coastal Andhra Pradesh and south Odisha. The minimum cloud top temperature is -93.0°C.

At 1200 UTC of 19th July, based on INSAT-3D imagery, the convection has further organized. The intensity of the system was C.I.1.5. Scattered to broken low and medium clouds with embedded intense to very intense convection were observed over northwest and adjoining west-central Bay of Bengal, as well as north coastal Andhra Pradesh and Odisha. The minimum cloud top temperature is -93.0°C.

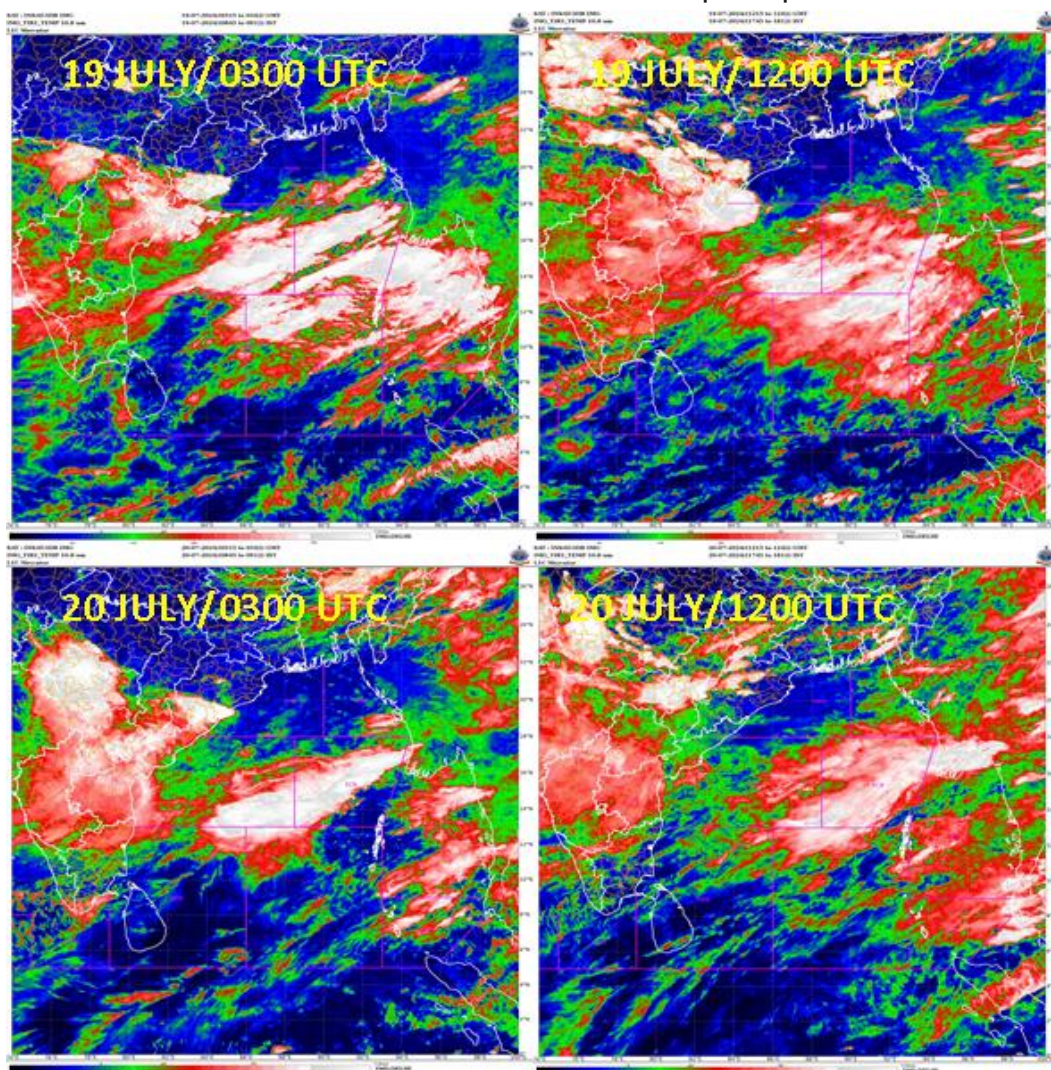


Fig.2(a): INSAT-3D enhanced colored imageries during life cycle of Depression over Northwest and adjoining Westcentral Bay of Bengal during 19th July-20th July 2024

At 0300 UTC of 20th July, based on INSAT-3D visible imagery, the system's intensity was C.I.1.5. Scattered to broken low and medium clouds with embedded intense to very intense convection were observed over west-central and adjoining northwest Bay of Bengal, off south Odisha and adjoining north Andhra Pradesh coasts, as well as south Odisha and north coastal Andhra Pradesh. The minimum cloud top temperature was -93.0°C.

At 1200 UTC of 20th July, based on INSAT-3D imagery, the system was positioned over the south Odisha coast as a vortex. Associated scattered to broken low and medium clouds with embedded intense to very intense convection were observed over south Chhattisgarh and northwest Odisha, with moderate to intense convection over north Chhattisgarh and Jharkhand. The minimum cloud top temperature was -93.0°C.

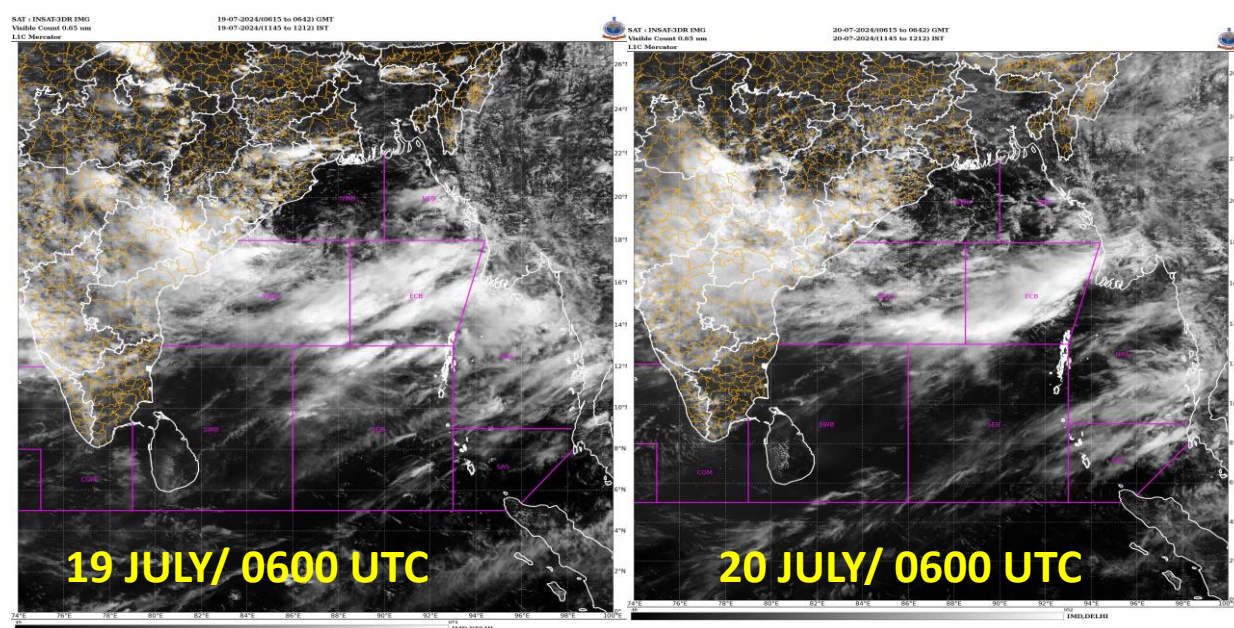


Fig.2 (b): INSAT-3D Visible imageries during life cycle of Depression over Northwest and adjoining Westcentral Bay of Bengal during 19th July-20th July 2024

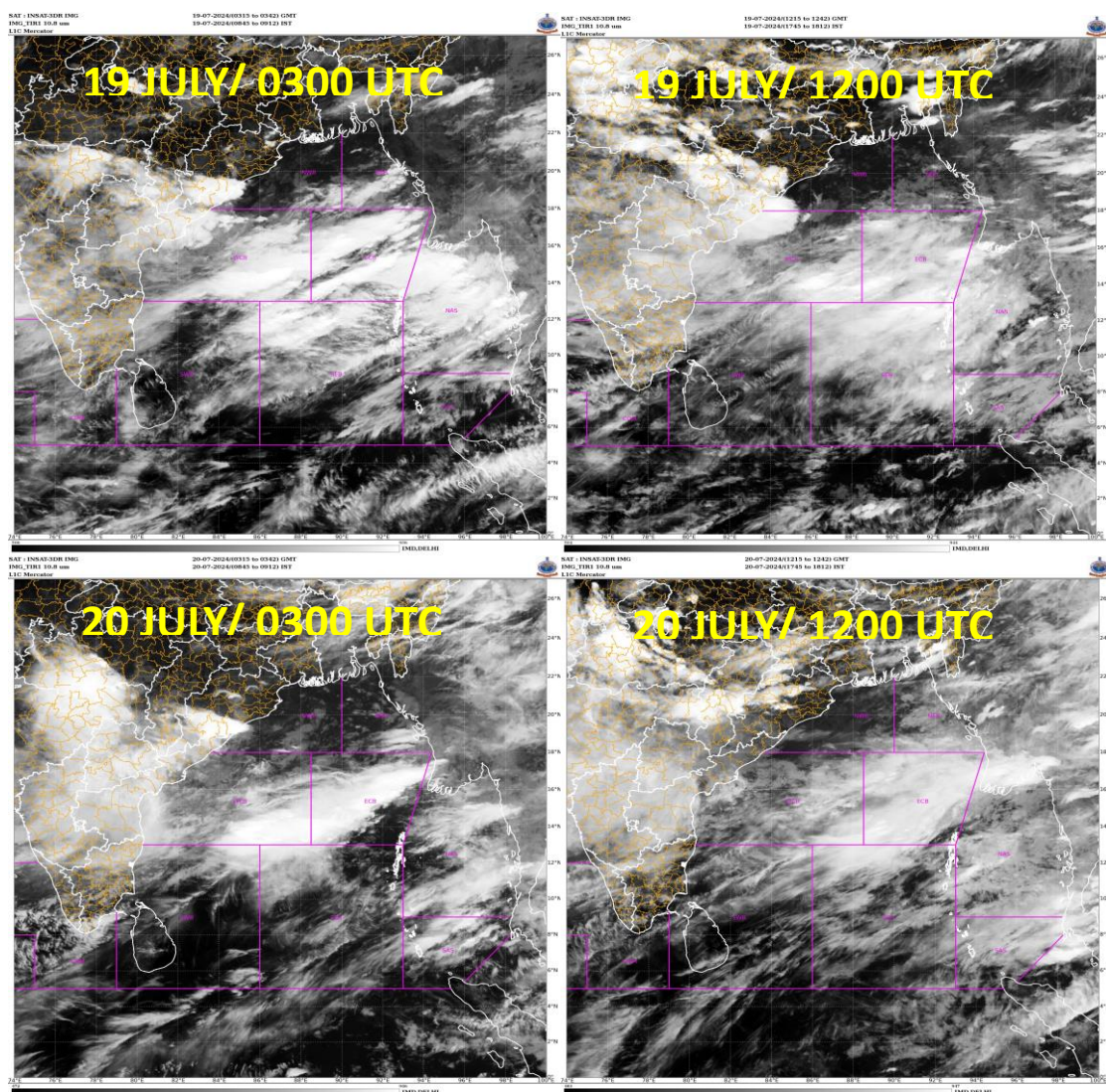


Fig.2(c): INSAT-3D IR imageries during life cycle of Depression over Northwest and adjoining Westcentral Bay of Bengal during 19th July-20th July 2024

ASCAT winds in figure 3, clearly indicated that the circulation associated with the depression over northwest and adjoining westcentral BoB on 19th and along the Odisha coast on 20th July 2024.

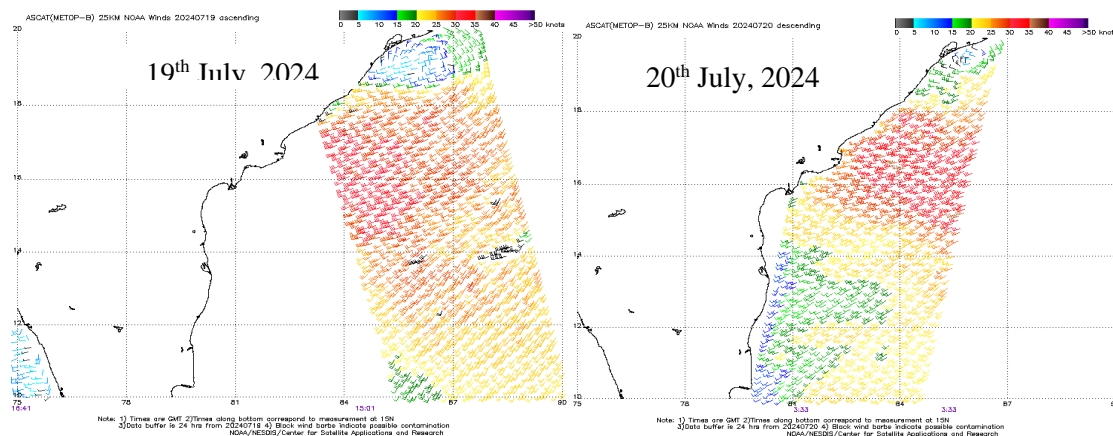


Fig. 3: ASCAT winds on 19th and 20th July 2024.

5. Dynamical Features

IMD GFS (T1534) daily analyses at 0000 UTC of mean sea level pressure (MSLP), winds at various pressure levels from 19th July to 20th July are presented in **Fig. 4(a) to 4(b)** respectively.

The MSLP analysis field on 19th July indicated that the system was over northwest BoB near 19.5°N/86.0°E. Actually, based on the best track the system was located near 19.1°N/86.2°E at 0300 UTC. Thus, GFS well captured the initial conditions on 19th July.

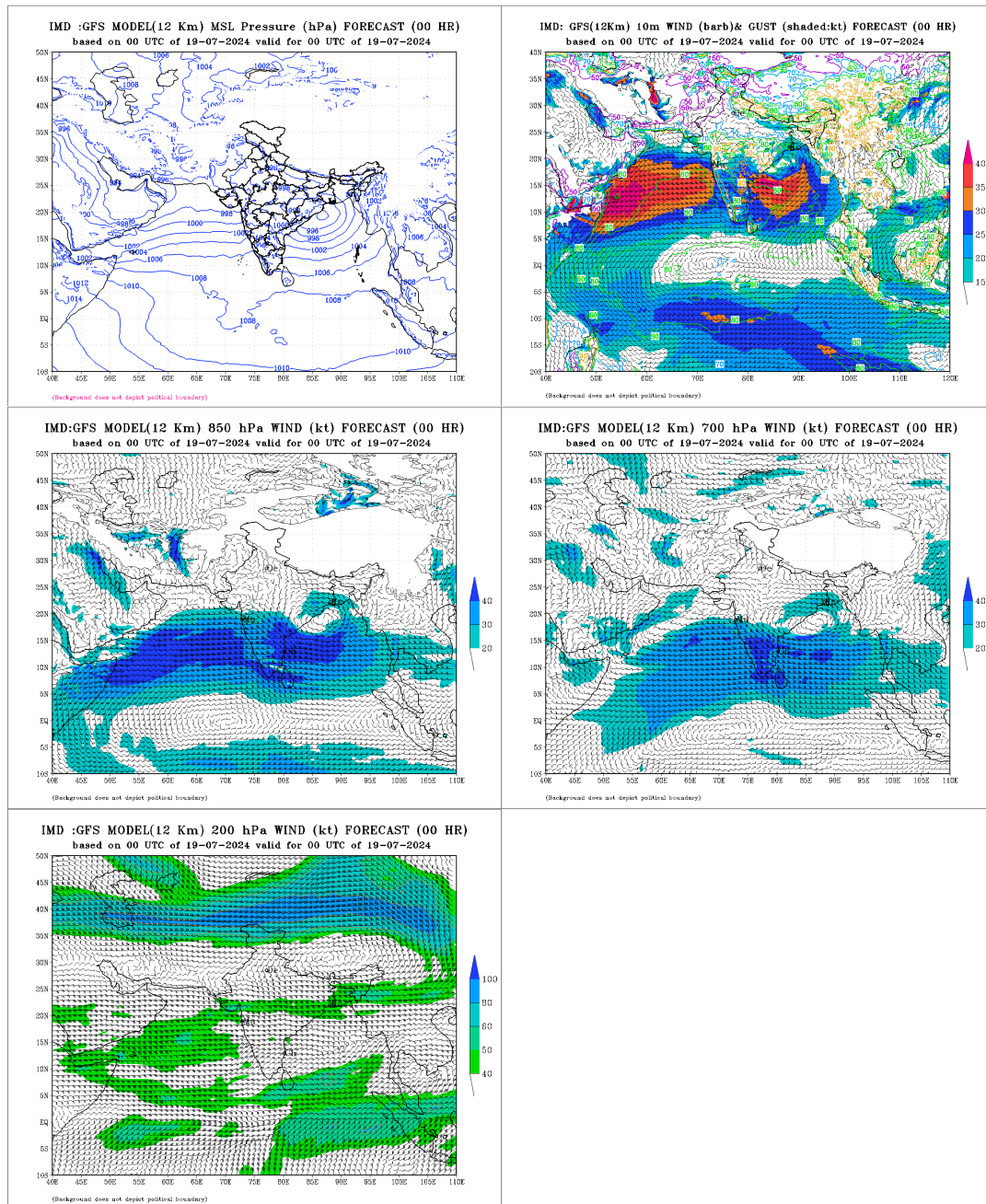


Fig. 4(a): IMD GFS (T1534) mean sea level pressure (MSLP), winds at 10m, 850, 500 and 200 hPa levels based on 0000 UTC of 19th July 2024

The MSLP analysis field on 20th July indicated that the system touched the Odisha coast and lay centered at 19.8°N/86.0°E. Actually, based on the best track the system was located at 19.6°N/85.5°E at 0000 UTC of 20th July. Thus, GFS reasonably captured the initial conditions on 19th July. It also indicated that the system vertically extended up to 500 hPa level.

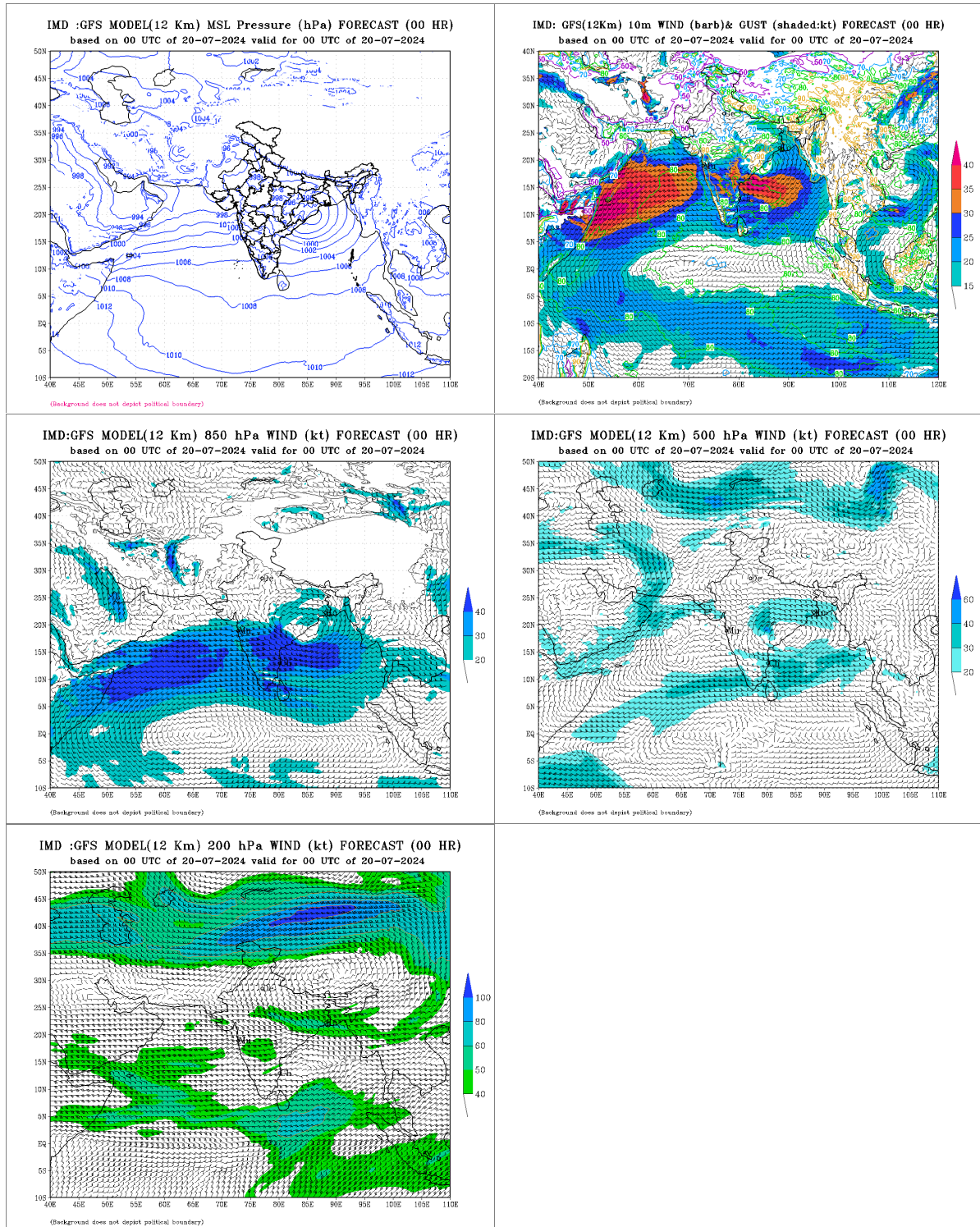


Fig. 4(b): IMD GFS (T1534) mean sea level pressure (MSLP), winds at 10m, 850, 500 and 200 hPa levels based on 0000 UTC of 20th July 2024

6. Realized Weather

Rainfall associated with the deep depression based on IMD-NCMRWF satellite gauge merged data are depicted in Fig 5. It is seen that heavy to very heavy rainfall occurred at isolated places over coastal Andhra Pradesh and coastal Odisha on 19th July & heavy to very heavy rainfall at isolated places over costal Odisha, costal Andhra Pradesh on 20th July.

Light to moderate rainfall at a few places with heavy to very heavy rainfall at isolated places occurred over Madhya Pradesh, Jharkhand, Chhattisgarh and Odisha on 20th July.

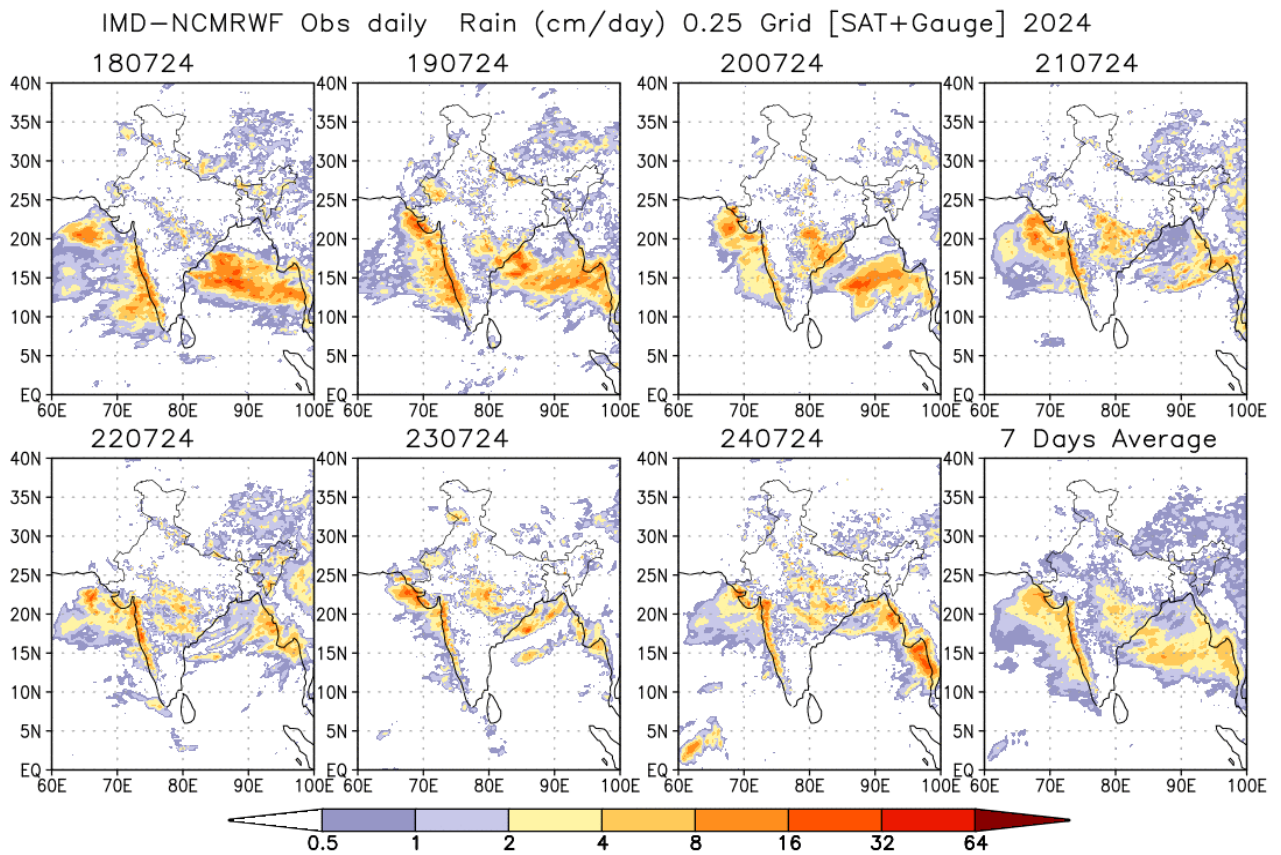


Fig. 5: NCMRWF-IMD satellite gauge merged data plots of realized 24 hours accumulated rainfall from 18th to 24th July, 2024.

5.1 Rainfall forecast verification

The forecast for heavy to extremely heavy rainfall episodes in association with the system are verified with the 24 hours accumulated rainfall realized at various stations. The details of the day-wise verification are given in Table -2.

Table 2: Day wise daily 24 hours cumulative rainfall forecast verification with station observations

| Date/Base Time of observation | 24 hr Heavy rainfall warning ending at 0300 UTC of next day | Realised 24-hour heavy rainfall (≥ 7 cm) ending at 0300 UTC of date |
|--------------------------------------|--|--|
| 19.07.2024 / 0830 | <p>Odisha:</p> <ul style="list-style-type: none"> ❖ South Odisha: Heavy to very heavy rainfall at a few places is very likely over South Odisha on 19th and 20th July and extremely heavy rainfall at isolated places on 19th July. ❖ North Odisha: Heavy to very heavy rainfall at isolated places on 19th and 20th July. <p>Gangetic West Bengal: Light to moderate rainfall is very likely at most places on 19th and 20th July.</p> <p>Andhra Pradesh:</p> <ul style="list-style-type: none"> ❖ North Coastal Andhra Pradesh: Heavy to very heavy rainfall at a few places is most likely on 19th & 20th July and extremely heavy rainfall at isolated places on 19th July. ❖ South Coastal Andhra Pradesh: Heavy rainfall at isolated places is likely over South Coastal Andhra Pradesh on 19th and 20th July. <p>Jharkhand: Heavy rainfall at isolated places is very likely on 20th July.</p> <p>Chattisgarh: Heavy to very</p> | <p>Odisha</p> <p>Chitrakunda K Guma (Malkangiri) & Korukunda (Malkangiri) – 22 each, Malkangiri (Malkangiri) - 18, Mathili (Malkangiri) & Kotpad (Koraput) - 16 each, Padia (Malkangiri) - 13, Nandahandi (Nawarangpur), Tentulikhunti (Nawarangpur) & Papadahandi (Nawarangpur) - 11 each, Aska (Ganjam) & Kosagumda (Nawarangpur) - 10 each, Nawarangpur (Nawarangpur), Nawarangpur Pto (Nawarangpur), Jeypore (Koraput), Nandapur (Koraput) & Th Rampur (Kalahandi) - 9 each, Purushottampur (Ganjam) & Lamataput (Koraput) - 8 each, Berhampur (Ganjam), Similiguda (Koraput), Rangeilunda (Ganjam), Ganjam (Ganjam), Pottangi (Koraput) & Dharakote (Ganjam) - 7 each.</p> <p>Coastal A.P. & Yanam</p> <p>Chintur (Alluri Sitharamaraju) - 21, Anakapalle (Anakapalli) - 13, Nuzvid (Eluru) - 10, Paderu (Alluri Sitharamaraju), Vararamachandrapur (Alluri Sitharamaraju) & Narsipatnam (Anakapalli) - 9 each, Araku Valley (Alluri Sitharamaraju) & Kukunoor (Eluru) – 8 each, Vishakhapatnam Ap (Vishakhapatnam), Therlam (Vizianagaram), Bondapalle (Vizianagaram),</p> |

| | | |
|-------------------|--|---|
| | <p>heavy rainfall at isolated places is very likely on 19th and 20th July and extremely heavy rainfall at isolated places on 19th July.</p> <p>Telangana & Vidarbha: Heavy to very heavy rainfall at a few places and extremely heavy rainfall at isolated places is very likely on 19th July. Heavy to extremely heavy rainfall at isolated places is very likely on 20th July.</p> | <p>Kurupam(Parvathipuram Manyam), Tekkali(Srikakulam), Kunavaram (Alluri Sitharamaraju) & Chodavaram (Anakapalli) – 7 each</p> <p><u>Rayalaseema</u></p> <p>Rudravaram (Nandyal) & Dornipadu (Nandyal) – 7 each,</p> <p><u>Telangana</u></p> <p>Venkatapuram (Mulugu) – 8, Bayyaram (Mahabubabad), Julurpad (Kothagudem) & Manuguru (B. Kothagudem) – 7 each</p> <p><u>Chhattisgarh</u></p> |
| 20.07.2024 / 0830 | <p>Gangetic West Bengal: Light to moderate rainfall is very likely at most places on 20th July.</p> <p>Odisha:</p> <ul style="list-style-type: none"> ❖ South Odisha: Heavy to very heavy rainfall at a few places is very likely over South Odisha on 20th July ❖ North Odisha: Heavy rainfall at isolated places on 20th July. <p>Chattisgarh:</p> <ul style="list-style-type: none"> ❖ South Chattisgarh: Heavy to extremely heavy rainfall at isolated places is very likely on 20th and isolated heavy to very heavy rainfall on 21st July. ❖ North Chattisgarh: Heavy to very heavy rainfall at isolated places is very likely on 20th and isolated heavy rainfall on 21st July. <p>Andhra Pradesh:</p> | <p>Bhairamgarh (Bijapur) - 25, Aundhi (Mohala Manpur Chowki), Durgkondal (Kanker) & Bhanupratappur (Kanker) - 17 each, Konta (Sukma), Sukma (Sukma) & Dornapal (Sukma) – 15 each, Gadiras (Sukma) - 14, Doundi (Balod), Tongpaal (Sukma), Kutaru (Bijapur), Chhindgarh (Sukma), Jagargunda (Sukma) & Nangur (Bastar) - 13 each, Antagarh (Kanker), Narayanpur (Narayanpur), Bijapur (Bijapur) & Lal Bahadur Nagar (Rajnandgaon) - 12 each, Kohkameta (Narayanpur), Gangalur (Bijapur), Bastanar (Bastar), Chhuria (Rajnandgaon) & Katekalyan (Dantewada) - 11 each, Kuakonda (Dantewada), Gidam (Dantewada), Manpur (Mohala Manpur Chowki), Gurur (Balod), Bhanpuri (Bastar) & Pakhanjur (Kanker) - 10 each, Kondagaon (Kondagaon), Darbha (Bastar), Chhotedongar (Narayanpur), Lohandiguda (Bastar), Dantewara (Dantewada), Orcha (Narayanpur), Balod (Balod),</p> |

| | | |
|--|---|---|
| | <p>❖ North Coastal Andhra Pradesh: Heavy to very heavy rainfall at isolated places is very likely on 20th July and heavy rainfall at isolated places is likely on 21st July.</p> <p>❖ South Coastal Andhra Pradesh: Heavy rainfall at isolated places is likely over South Coastal Andhra Pradesh on 20th July.</p> <p>Vidarbha: Heavy to very heavy rainfall at a few places on 20th & 21st July and extremely heavy rainfall at isolated places on 20th July.</p> <p>Telangana: Heavy to very heavy rainfall at isolated places is very likely on 20th July and heavy rainfall at isolated places is likely on 21st July.</p> | <p>Khadgaon (Mohala Manpur Chowki), Bade Bacheli (Dantewada), Jagdalpur (Bastar), Dongargarh (Rajnandgaon) & Ambagarh Chowki (Mohala Manpur Chowki) - 9 each, Charama (Kanker), Usoor (Bijapur), Kukrel (Dhamtari), Baderajpur (Kondagaon), Mohla (Mohala Manpur Chowki), Dhanora (Kondagaon), Pharasgaon (Kondagaon) & Bastar (Bastar) - 8 each, Dongargaon (Rajnandgaon), Makadi (Kondagaon), Kanker (Kanker), Barsur (Dantewada), Dondilohara (Balod) & Gundardehi (Balod) - 7 each</p> <p><u>Vidharbha</u></p> <p>Lakhandur (Bhandara) - 24, Pauni (Bhandara) - 20, Bramhapuri (Chandrapur) - 19, Arjuni Morgaon (Gondia) - 15, Desaiganj (Gadchiroli), Bhiwapur (Nagpur) - 14 each, Deori (Gondia), Armori (Gadchiroli), Nagbhir (Chandrapur) & Umrer (Nagpur) - 12 each, Kurkheda (Gadchiroli), Korchi (Gadchiroli), Chimur (Chandrapur) & Bhandara (Bhandara) - 11 each, Kuhi (Nagpur), Sakoli (Bhandara), Sindewahi (Chandrapur), Kamptee (Nagpur), Dhanora (Gadchiroli) & Lakhani (Bhandara) - 10 each, Bhamragad (Gadchiroli), Selu (Wardha), Nagpur Aerodrome (Nagpur), Agriculture College (Nagpur) & Nagpur (Nagpur) - 9 each, Gadchiroli (Gadchiroli), Sadakarjuni (Gondia) & Salekasa (Gondia) - 8 each, Mauda (Nagpur), Wardha (Wardha), Tirora (Gondia), Sakoli (Bhandara),</p> |
|--|---|---|

| | | |
|--|--|---|
| | | <p>Tiroda(Gondia), Saoli (Chandrapur), Samudrapur (Wardha), Hinganghat (Wardha), Etapalli (Gadchiroli) & Mul (Chandrapur) - 7 each,</p> <p><u>21st July:</u></p> <p>Vidarbha: Nagpur Aerodrome & Gadchiroli-16 each, Gadchiroli-15, Sindewahi & Chandrapur-14 each, Pombhurna, Perseoni, Hingna & Bhamragad-11 each, Bhadravati & Mauda-10 each, Chamorshi, Deoli, Kamptee, Warora, Samudrapur & Ramtek-9 each, Selu, Sironcha, Chimur, Armori, Wani, Saoner, Zarizamni, Tumsar & Wardha-8 each, Amgaon, Hinganghat, Maregaon, Umrer, Ralegaon & Kalmeshwar-7 each</p> <p>Chhattisgarh: Bijapur-21, Gurur- 16, Kutaru & Rajnandgaon-14 each, Marri Bangla Deori, Arjunda, Gangalur & Balod-12 each, Gundardehi-11, Bhopalpatnam-10, Lal Bahadur Nagar, Bhairamgarh, Usoor, Dhamtari & Dongargarh-9 each, Nerharpur & Sarona-8 each, Dongargaon, Gidam, Bade Bacheli & Narayanpur-7 each</p> <p>Telangana: Mortad-14, Mallapur, Metpalle & Sarangapurnr-13 each, Laxmanchanda, Khanpur & Balkonda-12 each, Kammar Palle, Navipet, Bheemgal, Makloor & Nandipet-11 each, Velpur, Ranjal, Armur, Yeda Palle, Jannaram & Nirmal-10 each, Kathlapur, Regonda, Shayampet, Nizamabad, Atmakurwrgl & Jainoor-9 each,</p> |
|--|--|---|

| | | |
|--|--|--|
| | | <p>Bodhan, Parkal, Aswapuram, Venkatapuram, Asifabad, Chityal, Huzurabad, Gangadhara, Dandepalle & Jaipur-8 each, Sirpuru, Kataram, Manuguru & Dummagudem-7 each</p> <p>Odisha: Athmalik-15, Boden-14, Padampur, Padmapur, Sinapali & Dunguripalli-11 each, Nawapara & Bolangir-10 each, Bangamunda-9, Salebhatta, Gania, Patnagarh, Binika, Kantamal, Agalpur & Ullunda-8 each, Tarva, Mathili, Khariar, Boudhgarh, Barpalli, Gaisilet, Chitrakunda K Guma, Khairamal, Jaipatna & Komna-7 each</p> |
|--|--|--|

7. Damage due to the system

No damage was reported in association with this system.

8. Operational Forecast Performance

- Extended Range Outlook for Cyclogenesis dated 4th July indicated low probability for the formation of another low-pressure area over westcentral Bay of Bengal during later part of the second week.
- The daily Tropical Weather Outlook issued from 15st July indicated that a fresh low pressure area is likely to form over west central and adjoining northwest Bay of Bengal around 19th July 2024.
- The first bulletin issued on formation of depression on 19th July indicated that It moved northwestwards and concentrated into a depression and lay centered at 0300 UTC of 19th July, 2024 over northwest and adjoining westcentral Bay of Bengal off Odisha and adjoining north Andhra Pradesh coasts.
- Thus, it is seen that all parameters including the genesis, track, intensity and landfall point were well predicted by IMD/RSMC New Delhi.

9. Bulletins issued by IMD

- Track, intensity and landfall forecast: IMD continuously monitored, predicted and issued bulletins containing track & intensity forecast from the stage of depression till the system weakened into a low pressure area. The forecast of these parameters were issued from the
- Adverse weather warning bulletins: The depression forecasts along with expected adverse weather like heavy rain were issued with every six hourly update to central, state and district level disaster management agencies including MHA NDRF, NDMA for all Odisha, Uttar Pradesh, Chhattisgarh, Madhya Pradesh, Jharkhand, West Bengal and Bihar. The bulletins also contained the suggested action for disaster managers and general public in particular for fishermen. These bulletins were also issued to Defence including Indian Navy & Indian Air Force, NDRF, Indian Coast Guard, ports, Shipping, Fishery, Railways, Surface Transport & Aviation Authorities.
- Warning graphics: The graphical display of the observed and forecast track was disseminated by email and uploaded in the RSMC, New Delhi website (<http://rsmcnewdelhi.imd.gov.in/>) regularly. The adverse weather warnings related to heavy rain were also presented in graphics along with colour codes in the website.
- Warning and advisory for marine community: The six hourly bulletins under Global Maritime Distress Safety System (GMDSS) were issued by the Marine Weather Services Division at New Delhi and bulletins for maritime interest were issued by Area Cyclone Warning centre of IMD at Kolkata & Chennai and Cyclone Warning Centres at Visakhapatnam to ports, fishermen, coastal and high sea shipping community.
- Fishermen Warning: Regular warnings for fishermen for deep sea of BoB and the states of Andhra Pradesh, Orissa & West Bengal were issued since 14th July onwards.
- Warning and advisory through social media: Daily updates (every six hourly or whenever there was any significant change in intensity/track) were uploaded on facebook and tweeter regularly during the life period of the system from 19th morning onwards, updates were posted on facebook and tweeter.
- Diagnostic and prognostic features of Depression: The prognostics and diagnostics of the system were described in the RSMC bulletins.

Statistics of bulletins issued by RSMC New Delhi in association with this system are given in Table 3.

Table 3: Bulletins issued by Cyclone Warning Division, IMD, New Delhi

| SN | Bulletins | No. of Bulletins | Issued to |
|----|-------------------------------|------------------|---|
| 1 | National Bulletin | 8 | 1. IMD's website 2. FAX and e-mail to Control Room NDM, Ministry of Home affairs, Control Room NDMA, Cabinet Secretariat, Minister of Sc. & Tech, Secretary MoES, DST, HQ Integrated Defense Staff, DG Doordarshan, All India Radio, DG-NDRF, Director Indian Railways, Indian Navy, IAF, Chief Secretary: West Bengal, Odisha, Andhra Pradesh, Chhattisgarh, Jharkhand, Karnataka, Maharashtra, Gujarat and Telangana |
| 2 | RSMC Bulletin | 9 | 1. IMD's website 2. All WMO/ESCAP member countries including Bangladesh through GTS and E-mail. 3. Indian Navy, IAF by E-mail |
| 3 | GMDSS Bulletins | 3 | 1. IMD website, RSMC New Delhi website 2. Transmitted through WMO Information System (WIS) to Joint WMO/IOC Technical Commission for Ocean and Marine Meteorology (JCOMM) |
| 4 | Warnings through SMS | Frequently | SMS to (i) disaster managers at national level and concerned states (every time when there was change in track, intensity and landfall characteristics) by IMD Headquarters, (ii) to General Public registered through RSMC website by IMD Headquarters and RMC Kolkata office (iii) to fishermen through INCOIS network. |
| 5 | Warnings through Social Media | Daily | Depression Warnings were uploaded on Social networking sites (Facebook and Twitter) since inception to weakening of system (every six hourly). |

10. Acknowledgement

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