



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI
TROPICAL CYCLONE ADVISORY**

DEMS-RSMC SPECIAL TROPICAL CYCLONES NEW DELHI DATED 15.06.2023

FROM: RSMC –TROPICAL CYCLONES, NEW DELHI

**TO: STORM WARNING CENTRE, NAYPYI TAW (MYANMAR)
STORM WARNING CENTRE, BANGKOK (THAILAND)
STORM WARNING CENTRE, COLOMBO (SRILANKA)
STORM WARNING CENTRE, DHAKA (BANGLADESH)
STORM WARNING CENTRE, KARACHI (PAKISTAN)
METEOROLOGICAL OFFICE, MALE (MALDIVES)
OMAN METEOROLOGICAL DEPARTMENT, MUSCAT (THROUGH RTH JEDDAH)
YEMEN METEOROLOGICAL SERVICES, REPUBLIC OF YEMEN (THROUGH RTH JEDDAH)
NATIONAL CENTRE FOR METEOROLOGY, UAE (THROUGH RTH JEDDAH)
PRESIDENCY OF METEOROLOGY AND ENVIRONMENT, SAUDI ARABIA (THROUGH RTH JEDDAH)
IRAN METEOROLOGICAL ORGANISATION, (THROUGH RTH JEDDAH)
QATAR METEOROLOGICAL DEPARTMENT (THROUGH RTH JEDDAH)**

TROPICAL CYCLONE ADVISORY NO. 76 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 48 HOURS ISSUED AT 2230 UTC OF 15.06.2023 BASED ON 2100 UTC OF 15.06.2023

SUB: SEVERE CYCLONIC STORM “BIPARJOY” (PRONOUNCED AS “BIPORJOY”) OVER SAURASHTRA & KUTCH (LAND AREA OF INDIA)

THE SEVERE CYCLONIC STORM “BIPARJOY” (PRONOUNCED AS “BIPORJOY”) OVER SAURASHTRA & KUTCH MOVED NORTHEASTWARDS WITH A SPEED OF 13 KMPH DURING PAST 6-HOURS AND LAY CENTERED AT 2100 UTC OF 16TH JUNE, 2023 OVER THE SAME REGION NEAR LATITUDE 23.5°N AND LONGITUDE 68.9°E, ABOUT 40 KM NORTHEAST OF JAKHAU PORT (GUJARAT) AND 30 KM NORTH OF NALIYA.

IT IS VERY LIKELY TO MOVE NEARLY NORTHEASTWARDS ACROSS NORTH GUJARAT AND WEAKEN GRADUALLY INTO A CYCLONIC STORM OVER SAURASHTRA & KUTCH BY 0000UTC OF 16TH JUNE AND SUBSEQUENTLY INTO A DEPRESSION OVER SOUTH RAJASTHAN BY 1200UTC OF THE SAME DAY.

FORECAST TRACK AND INTENSITY ARE GIVEN BELOW:

DATE/TIME(IST)	POSITION LAT. °N/ LONG. °E	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
16.06.23/0230	23.5/68.9	90-100 GUSTING TO 110	SEVERE CYCLONIC STORM
16.06.23/0530	23.8/69.4	75-85 GUSTING TO 95	CYCLONIC STORM
16.06.23/1130	24.3/70.2	50-60 GUSTING TO 70	DEEP DEPRESSION
16.06.23/1730	25.0/71.2	35-45 GUSTING TO 55	DEPRESSION

Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION):NIL: 0%, LOW: 1-33%, , MODERATE: 34-66% AND HIGH: 67-100%
This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bulletins

AS PER INSAT 3D IMAGERY, VORTEX (BIPARJOY) OVER KUTCH REGION & NEIGHBOURHOOD NOW LAY CENTERED NEAR 23.6°N / 68.9°E OVER LAND. CENTER IS POORLY DEFINED IN IR IMAGERY. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION OVER NORTH ARSEA BET LAT 21.5N TO 24.5N LONG 66.5E TO 70.0E WEST GUJARAT GULF OF KUTCH & MODERATE CONVECTION OVER SOUTHEAST PAKISTAN. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 90°C.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED (MSW) IS 50 KNOTS GUSTING TO 60 KNOTS. THE ESTIMATED CENTRAL **PRESSURE IS 980 HPA**. SEA CONDITION IS LIKELY TO BE VERY HIGH TO HIGH OVER NORTHEAST ARABIAN SEA AND ROUGH TO VERY ROUGH OVER ADJOINING EASTCENTRAL ARABIAN SEA.

REMARKS:

SEA SURFACE TEMPERATURE IS AROUND 29-30°C OVER NORTHEAST ARABIAN SEA. OCEAN HEAT CONTENT IS 20-30KJ/CM² AND OFF SAURASHTRA & KUTCH COASTS. TOTAL PRECIPITABLE WATER IMAGERY INDICATES CONTINUED COLD AIR INCURSION INTO THE CORE OF SYSTEM AND HIGH VALUES CAN BE SEEN ONLY OVER A SMALLER REGION NEAR THE SYSTEM CENTRE. THE GRADIENT WIND ANALYSIS INDICATES THAT DURING PAST 24 HOURS, RADIUS (MAGNITUDE) OF GRADIENT WIND INCREASED (DECREASED) AND TEMPERATURE ANOMALY AT 300 HPA HAS DECREASED.

THE LOW LEVEL VORTICITY IS THE SAME AND IS AROUND $200 \times 10^{-6} \text{S}^{-1}$ NEAR THE SYSTEM CENTRE. LOW LEVEL CONVERGENCE IS ABOUT $10 \times 10^{-5} \text{S}^{-1}$ NEAR THE SYSTEM CENTRE AND UPPER LEVEL HAS DECREASED AND IS ABOUT $20 \times 10^{-5} \text{S}^{-1}$ TO THE SOUTH OF SYSTEM CENTRE. VERTICAL WIND SHEAR HAS SLIGHTLY DECREASED AND IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE RIDGE RUNS ALONG 24.5°N. THE DEEP LAYER MEAN WINDS, INDICATE A WESTERLY TROUGH ALONG 65.5E TO THE WEST OF SYSTEM CENTRE. THE SYSTEM IS TRACKING NORTHEASTWARDS UNDER THE INFLUENCE OF SOUTHWESTERLY WINDS PREVAILING TO THE NORTH OF THE RIDGE AND THE WESTERLY TROUGH. THEREFORE THE SYSTEM WILL BE STEARED MOSTLY BY THE DEEP LAYER MEAN WESTERLY WINDS.

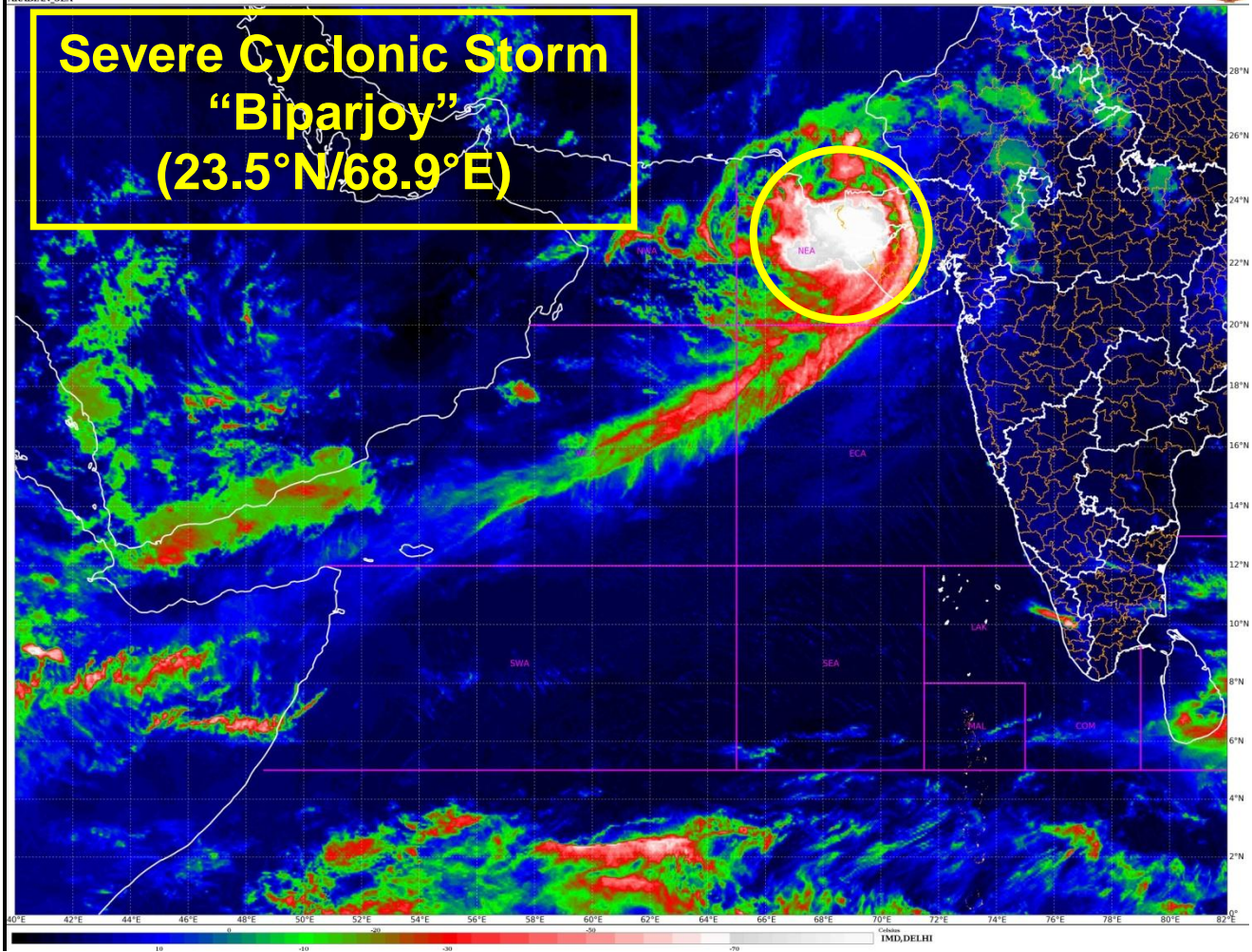
THE SYSTEM IS EXPERIENCING REDUCTION OF ITS INTENSITY DUE TO LAND INTERACTION AND DECREASE IN MIDDLE LEVEL HUMIDITY DUE TO DRY COLD AIR INTRUSION AND LAND INTERACTIONS. THEREFORE THE INTENSITY OF THE SYSTEM WEAKENED GRADUALLY AND IT WOULD BECOME A CYCLONIC STORM BY 0000 UTC OF 16TH JUNE.

BASED ON ENVIRONMENTAL CONDITIONS AND NWP MULTI-MODEL FORECASTS THE SYSTEM IS VERY LIKELY TO MOVE NEARLY NORTHEASTWARDS ACROSS NORTH GUJARAT AND WEAKEN GRADUALLY INTO A CYCLONIC STORM OVER SAURASHTRA & KUTCH BY 0000UTC OF 16TH JUNE AND SUBSEQUENTLY INTO A DEPRESSION OVER SOUTH RAJASTHAN BY 1200UTC OF THE SAME DAY.

**ARULALAN T
SCIENTIST C
RSMC NEW DELHI**

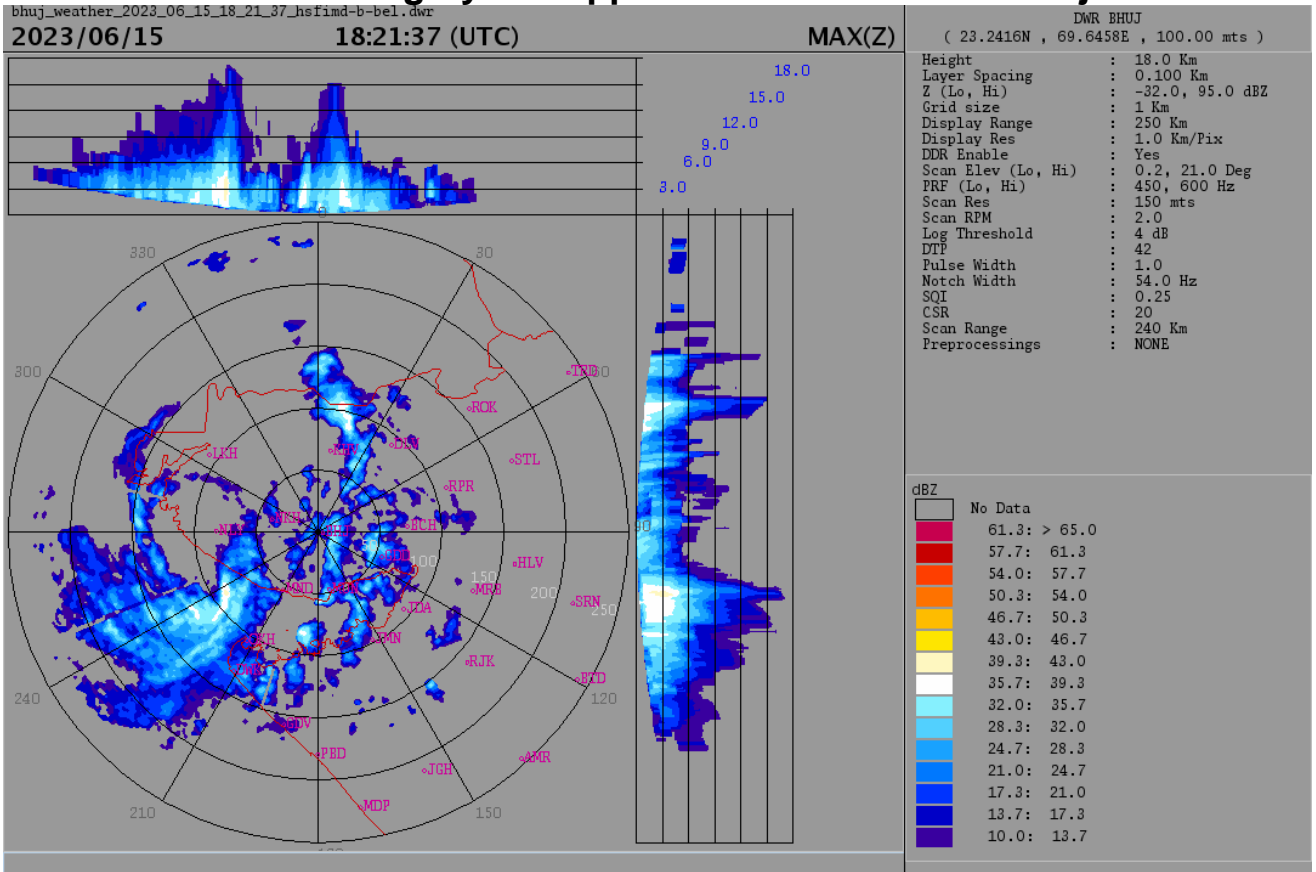


Severe Cyclonic Storm "Biparjoy" (23.5°N/68.9°E)



Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION):NIL: 0%, LOW: 1-33%, , MODERATE: 34-66% AND HIGH: 67-100%
This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bulletins

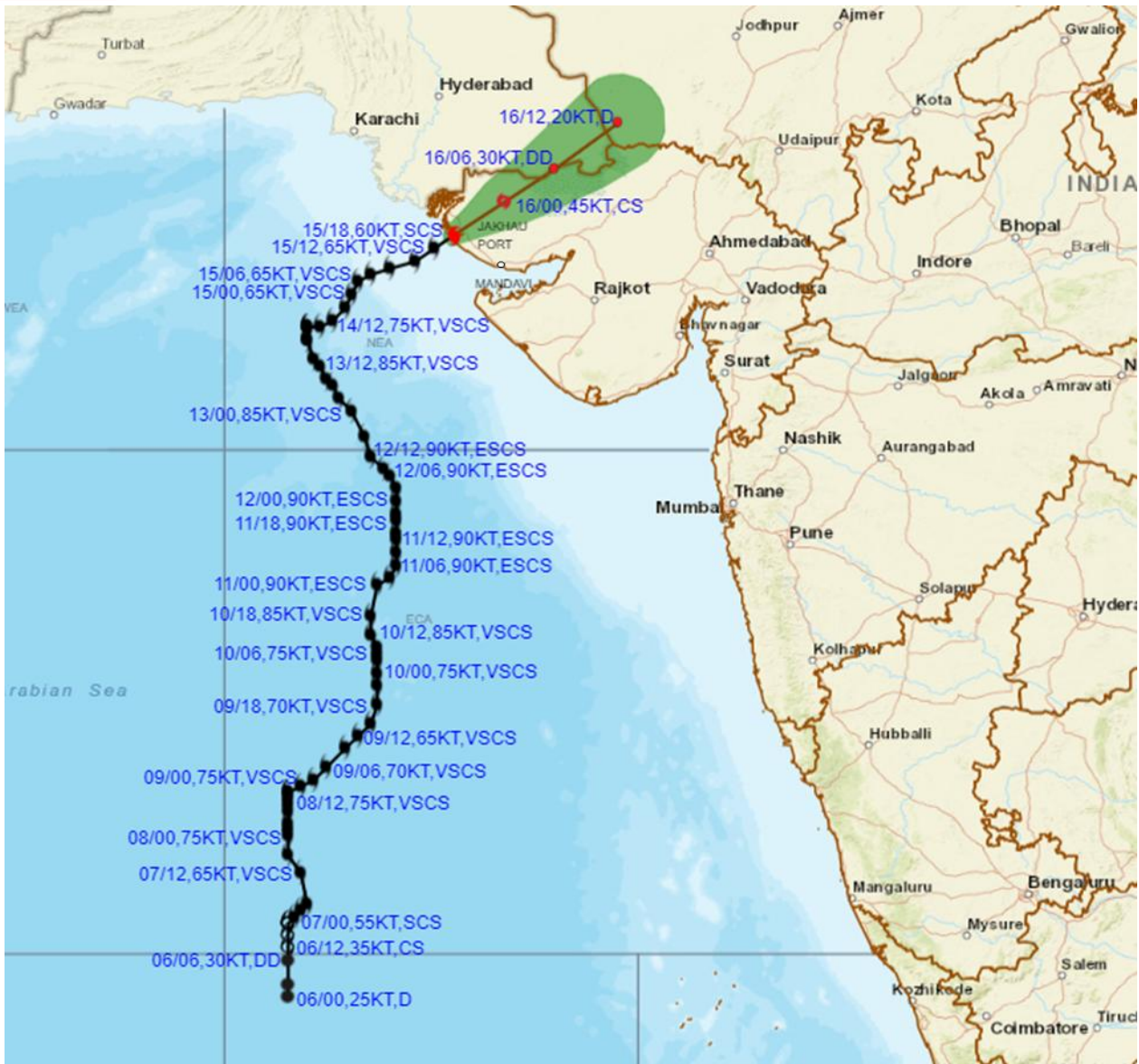
Radar Imagery of Doppler Weather Radar at Bhuj



Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C
 PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION):NIL: 0%, LOW: 1-33%, , MODERATE: 34-66% AND HIGH: 67-100%
 This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bulletins



OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY OF SEVERE CYCLONIC STORM "BIPARJOY" OVER SAURASHTRA & KUTCH BASED ON 1800 UTC (2330 IST) OF 15TH JUNE 2023.



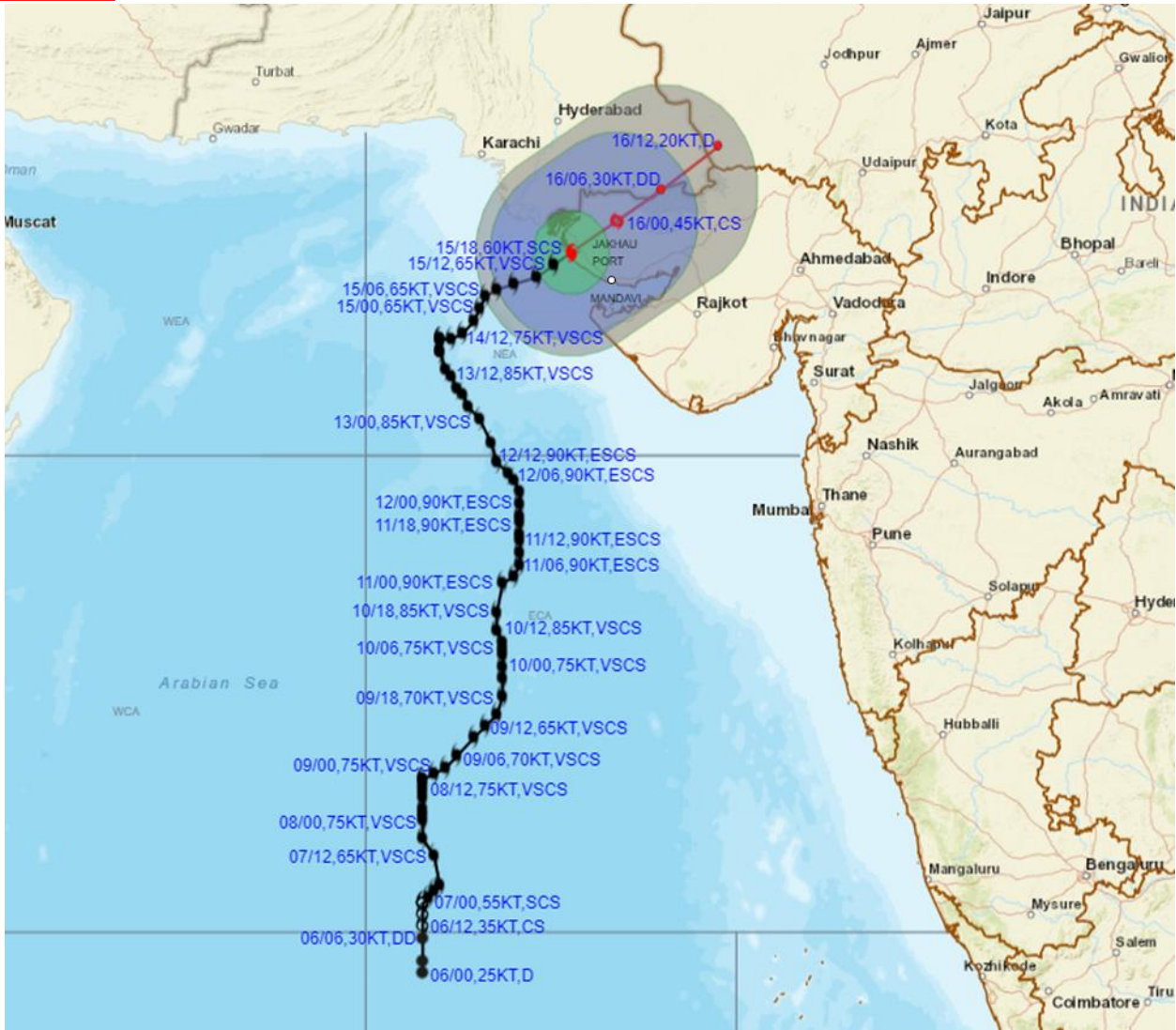
DATE/TIME IN UTC
 IST=UTC + 0530
 L: LOW PRESSURE AREA
 WML: WELL MARKED LOW PRESSURE AREA
 D: DEPRESSION (17-27 KT)
 DD: DEEP DEPRESSION (28-33 KT)
 CS: CYCLONIC STORM (34-47 KT)
 SCS: SEVERE CYCLONIC STORM (48-63KT)
 VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT)
 ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)
 SuCS: SUPER CYCLONIC STORM (\geq 120 KT)

- LESS THAN 34 KT
- 34-47 KT
- \geq 48 KT
- OBSERVED TRACK
- FORECAST TRACK
- CONE OF UNCERTAINTY

Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C
 PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION):NIL: 0%, LOW: 1-33%, , MODERATE: 34-66% AND HIGH: 67-100%
 This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bulletins



OBSERVED AND FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION OF SEVERE CYCLONIC STORM “BIPARJOY” OVER SAURASHTRA & KUTCH BASED ON 1800 UTC (2330 IST) OF 15TH JUNE 2023.



DATE/TIME IN UTC

IST=UTC + 0530

L: LOW PRESSURE AREA

WML: WELL MARKED LOW PRESSURE AREA

D: DEPRESSION (17-27 KT)

DD: DEEP DEPRESSION (28-33 KT)

CS: CYCLONIC STORM (34-47 KT)

SCS: SEVERE CYCLONIC STORM (48-63KT)

VSCS: VERY SEVERE CYCLONIC STORM (64-89 KT)

ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)

SuCS: SUPER CYCLONIC STORM (≥ 120 KT)

● LESS THAN 34 KT

○ 34-47 KT

○ ≥ 48 KT

— OBSERVED TRACK

— FORECAST TRACK

○ CONE OF UNCERTAINTY

AREA OF MAXIMUM SUSTAINED WIND SPEED:

— 28-33 KT (52-61 KMPH)

— 34-49 KT (62-91 KMPH)

— 50-63 KT (92-117 KMPH)

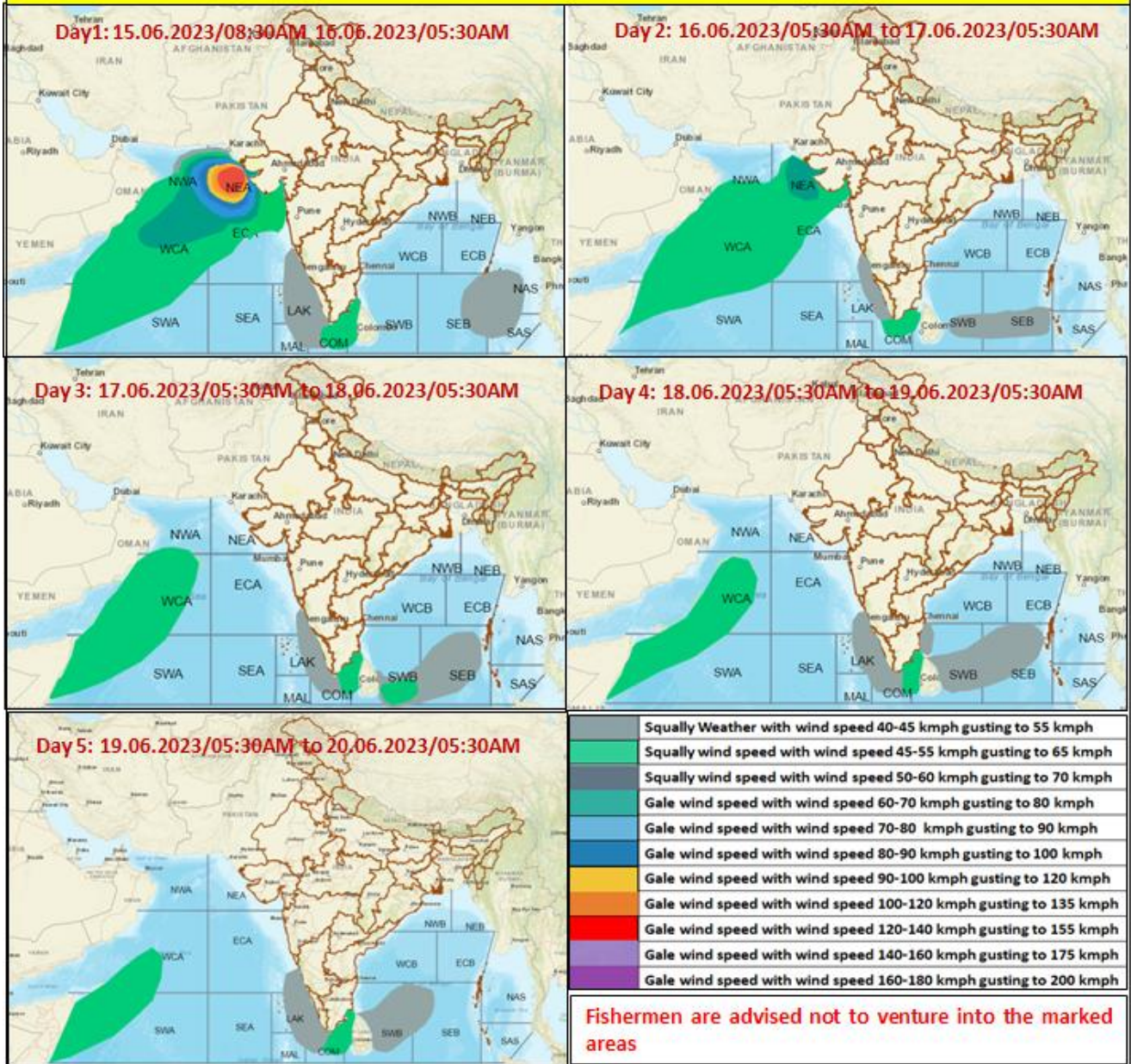
— ≥ 64 KT (≥118 KMPH)

IMPACT OVER THE SEA

MSW (knot/kmph)	Impact	Action
28-33 (52-61)	Very rough seas	Total suspension of fishing operations
34-49 (62-91)	High to very high seas	Total suspension of fishing operations
50-63 (92-117)	Very high seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION):NIL: 0%, LOW: 1-33%, , MODERATE: 34-66% AND HIGH: 67-100%
 This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bulletins

Fishermen warning graphics



Cloud distribution: (a) Isolated: <25%, Scattered:25-50%, Broken: 51-75%, Solid:>75%, Convection Intensity: (a) Weak: Cloud Top Temperature (CTT) >-25°C, (b) Moderate: CTT: - 25°C to -40°C, (c) Intense: CTT: - 41°C to -70°C and (d) Very Intense: : Less than -70°C
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION): NIL: 0%, LOW: 1-33%, , MODERATE: 34-66% AND HIGH: 67-100%
 This is a guidance Bulletin for WMO/ESCAP Panel Member countries. Visit respective National websites for Country specific Bulletins