



# REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI TROPICAL WEATHER OUTLOOK

# **DEMS-RSMC SPECIAL TROPICAL CYCLONES NEW DELHI DATED 22.10.2023**

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. 16 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND THE ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0000 UTC OF 23.10.2023 BASED ON 2100 UTC OF 22.10.2023.

SUB: (A) EXTREMELY SEVERE CYCLONIC STORM "TEJ" (PRONOUNCED AS TEJ) OVER WESTCENTRAL ARABIAN SEA AND (B) DEEP DEPRESSION OVER WESTCENTRAL BAY OF BENGAL

# (A) EXTREMELY SEVERE CYCLONIC STORM "TEJ" (PRONOUNCED AS TEJ) OVER WESTCENTRAL ARABIAN SEA

THE EXTREMELY SEVERE CYCLONIC STORM "TEJ" (PRONOUNCED AS TEJ) OVER WESTCENTRAL ARABIAN SEA CONTINUED TO MOVE NORTHWESTWARDS WITH A SPEED OF 13 KMPH DURING PAST 6 HOURS AND LAY CENTERED AT 2100 UTC OF TODAY, THE 22ND OCTOBER OVER WESTCENTRAL ARABIAN SEA, NEAR LATITUDE 14.1°N AND LONGITUDE 53.6°E, ABOUT 170 KM NORTH-NORTHWEST OF SOCOTRA (YEMEN, 41494), 330 KM SOUTH OF SALALAH (OMAN, 41316) AND 270 KM SOUTHEAST OF AL GHAIDAH (YEMEN, 41398).

IT IS VERY LIKELY TO CONTINUE TO MOVE NORTHWESTWARDS AND CROSS YEMEN COAST CLOSE TO AL- GHAIDAH DURING 1800 – 2100 UTC OF 23RD OCTOBER AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED OF 125-135 KMPH GUSTING TO 150 KMPH.

#### FORECAST TRACK AND INTENSITY OF THE SYSTEM IS GIVEN BELOW:

DATE/TIME(UTC)	POSITION LAT. ºN/ LONG. ºE	MAXIMUM SUSTAINED SURFACE	CATEGORY OF CYCLONIC DISTURBANCE
		WIND SPEED (KMPH)	51616115711162
22.10.23/2100	14.1/53.6	170-180 GUSTING TO 200	EXTREMELY SEVERE
			CYCLONIC STORM
23.10.23/0000	14.5/53.3	165-175 GUSTING TO 195	EXTREMELY SEVERE
			CYCLONIC STORM
23.10.23/0600	15.0/52.9	150-160 GUSTING TO 175	VERY SEVERE CYCLONIC
			STORM
23.10.23/1200	15.5/52.5	135-145 GUSTING TO 160	VERY SEVERE CYCLONIC
			STORM
23.10.23/1800	15.7/52.3	130-140 GUSTING TO 155	VERY SEVERE CYCLONIC
			STORM
24.10.23/0600	16.2/51.8	80-90 GUSTING TO 100	CYCLONIC STORM
24.10.23/1800	16.6/51.2	40-50 GUSTING TO 60	DEPRESSION
25.10.23/0600	17.0/50.6	25-35 GUSTING TO 45	WELL MARKED LOW

AS PER INSAT 3D IMAGERY, INTENSITY OF THE SYSTEM IS CHARACTERISED AS T 4.5/5.0. ASSOCIATED BROKEN LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER WESTCENTRAL & SOUTHWEST ARABIAN SEA BETWEEN LATITUDE 12.5°N TO 16.5°N LONGITUDE 51.5°E TO 55.5°E. MINIMUM CLOUD TOP TEMPRATURE IS MINUS 83°C. IR IMAGERY SHOWS INTENSE CONVECTION ENCIRCLING THE SYTEM CENTRE. THE OUTERMOST OUTFLOW BANDS ARE SEEN OVER N SOMALIA EAST YEMEN AND SOUTH OMAN.

MULTISATELLITE WINDS INDICATE STRONGER WINDS IN THE EASTERN SECTOR. TOTAL PRECIPITABLE WATER IMAGERY INDICATES WARM MOIST AIR INCURSION INTO THE SYSTEM CORE. DRY AIR INCURSION IS EXPECTED FROM ARABIAN PENINSULA AS THE SYSTEM MOVES NEAR THE YEMEN-OMAN COASTS FROM  $23^{\rm RD}$  OCTOBER.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED IS 95 KNOTS GUSTING TO 105 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 964 HPA.

#### STORM SURGE GUIDANCE:

STORM SURGE OF ABOUT 2 METER HEIGHT ABOVE THE ASTRONOMICAL TIDE IS LIKELY TO INUNDATE LOW LYING AREAS BETWEEN AL GHAYDAH AND AL FAYDAMI NEAR THE LANDFALL POINT AT THE TIME OF LANDFALL.

# **SEA CONDITION:**

- SOUTHWEST ARABIAN SEA:
  - **PHENOMENAL** SEA CONDITION IS PREVAILING AND WILL CONTINUE TILL 0000 UTC OF  $23^{RD}$  OCTOBER. IT IS LIKELY TO IMPROVE GRADUALLY BECOMING **HIGH TO VERY ROUGH** TILL 1200 UTC OF  $23^{RD}$ , VERY ROUGH TO ROUGH TILL 1200 UTC OF  $24^{TH}$  OCTOBER AND WOULD IMPROVE THEREAFTER.
- WESTCENTRAL ARABIAN SEA:
  PHENOMENAL SEA CONDITION IS PREVAILING AND WILL CONTINUE TILL 1200

UTC OF  $23^{\rm RD}$  OCTOBER. IT WOULD IMPROVE GRADUALLY THEREAFTER BECOMING **HIGH TO VERY ROUGH** BY 2100 UTC OF  $23^{\rm RD}$  OCTOBER. THEREAFTER, IT WOULD IMPROVE GRADUALLY.

# (B) DEEP DEPRESSION OVER WESTCENTRAL BAY OF BENGAL.

THE DEEP DEPRESSION OVER WESTCENTRAL BAY OF BENGAL REMAINED PRACTICALLY STATIONARY DURING PAST 6 HOURS AND LAY CENTERED AT 2100 UTC OF TODAY, THE 22ND OCTOBER OVER WESTCENTRAL BAY OF BENGAL, NEAR LATITUDE 16.4°N AND LONGITUDE 86.4°E, ABOUT 430 KM SOUTH OF PARADIP (ODISHA, 42976), 590 KM SOUTH-SOUTHWEST OF DIGHA (WEST BENGAL, 42901), AND 740 KM SOUTH-SOUTHWEST OF KHEPUPARA (BANGLADESH, 41984).

IT IS LIKELY TO INTENSIFY FURTHER INTO A CYCLONIC STORM DURING NEXT 18 HOURS. IT IS VERY LIKELY TO CONTINUE TO MOVE NEARLY NORTHWARDS TILL 0000 UTC OF 23RD OCTOBER, THEN NORTH-NORTHEASTWARDS AND CROSS BANGLADESH COAST BETWEEN KHEPUPARA AND CHITTAGONG AROUND 1200 UTC OF 25TH OCTOBER AS A DEEP DEPRESSION.

AS PER INSAT 3D IMAGERY, INTENSITY OF THE SYSTEM IS CHARACTERISED AS T 2.0. SHEAR PATTERN IS SEEN IN CLOUD IMAGERY. CLOUDS ARE SHEARED IN NORTHEAST SECTOR. BANDING FEATURES ARE APPEARING IN CLOUD IMAGERY ALONGWITH INCREASE IN CONVECTIVE CLOUDS IN CORE AREA, INDICATING FURTHER INTENSIFICATION OF THE SYSTEM. ASSOCIATED SCATTERED TO BROKEN LOW AND MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LAY OVER CENTRAL AND ADJOINING NORTH BAY OF BENGAL BETWEEN LATITUDE 15.0°N TO 20.0N AND LONGITUDE 84.5°E TO 91.0°E. MINIMUM CLOUD TOP TEMPRATURE IS MINUS 93°C. MULTISATELLITE WINDS INDICATE STRONGER WINDS IN EASTERN SECTOR. TOTAL PRECIPITABLE WATER IMAGERY INDICATES WARM MOIST AIR INCURSION INTO THE SYSTEM CORE.

ASSOCIATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1003 HPA.

FORECAST TRACK AND INTENSITY OF THE SYSTEM IS GIVEN BELOW:

DATE/TIME(UTC)	POSITION LAT. <sup>0</sup> N/ LONG. <sup>0</sup> E	MAXIMUM SUSTAINED SURFACE	CATEGORY OF CYCLONIC DISTURBANCE
		WIND SPEED (KMPH)	5.6161.62
22.10.23/2100	16.4/86.4	50-60 GUSTING TO 70	DEEP DEPRESSION
23.10.23/0000	17.0/86.5	55-65 GUSTING TO 75	DEEP DEPRESSION
23.10.23/0600	17.7/86.6	55-65 GUSTING TO 75	DEEP DEPRESSION
23.10.23/1200	18.4/86.9	60-70 GUSTING TO 80	CYCLONIC STORM
23.10.23/1800	19.0/87.3	60-70 GUSTING TO 80	CYCLONIC STORM
24.10.23/0600	20.0/88.2	60-70 GUSTING TO 80	CYCLONIC STORM
24.10.23/1800	20.8/89.3	55-65 GUSTING TO 75	DEEP DEPRESSION
25.10.23/0600	21.5/90.1	50-60 GUSTING TO 70	DEEP DEPRESSION
25.10.23/1800	22.4/90.8	40-50 GUSTING TO 60	DEPRESSION
26.10.23/0600	23.3/91.3	25-35 GUSTING TO 45	WELL MARKED LOW

## WIND GUIDANCE (WARNING GRAPHICS ENCLOSED):

- WESTCENTRAL BAY OF BENGAL: SQUALLY WIND SPEED REACHING 50-60 KMPH GUSTING TO 70 KMPH IS PREVAILING AND LIKELY TO INCREASE BECOMING 55-65 KMPH GUSTING TO 75 KMPH FROM 1200 UTC 23<sup>RD</sup> TILL 0000 UTC OF 24<sup>TH</sup> OCTOBER. IT IS LIKELY TO DECREASE GRADUALLY THEREAFTER BECOMING SQUALLY WIND SPEED REACHING 40-50 KMPH GUSTING 60 KMPH BY 1200 UTC OF 24<sup>TH</sup>.
- ADJOINING EASTCENTRAL BAY OF BENGAL: SQUALLY WIND SPEED REACHING 40-50 KMPH GUSTING TO 60 KMPH IS LIKELY TO PREVAIL TILL 0000 UTC OF 23<sup>RD</sup> OCTOBER AND BECOMING 50-60 KMPH GUSTING TO 70 KMPH ON 24<sup>TH</sup> AND DECREASE FROM 25<sup>TH</sup> ONWARDS.
- NORTH BAY OF BENGAL:
  - SQUALLY WIND SPEED REACHING 40-50 KMPH GUSTING TO 60 KMPH IS LIKELY ON 22<sup>ND</sup> and likely to increase gradually becoming **Gale Wind** speed reaching 60-70 kmph gusting to 80 kmph on 24<sup>TH</sup> october.
- ALONG & OFF ODISHA, WEST BENGAL, BANGLADESH AND NORTH MYANMAR COASTS:

SQUALLY WIND SPEED REACHING 40-50 KMPH GUSTING TO 60 KMPH IS LIKELY FROM 1200 UTC OF 23<sup>RD</sup> TO 24<sup>TH</sup> ALONG & OFF ODISHA COAST. SQUALLY WIND SPEED REACHING 40-50 KMPH GUSTING TO 60 KMPH IS LIKELY TO COMMENCE ALONG & OFF WEST BENGAL, BANGLADESH AND NORTH MYANMAR COASTS FROM 0000 UTC OF 24<sup>TH</sup>. IT WOULD GRADUALLY INCREASE BECOMING 55-65 KMPH GUSTING TO 75 KMPH ALONG & OFF BANGLADESH COAST, 50-60 KMPH GUSTING TO 70 KMPH ALONG & OFF NORTH MYANMAR COAST AND 45-55 KMPH GUSTING TO 65 ALONG & OFF WEST BENGAL COAST ON 25<sup>TH</sup> OCTOBER.

### **SEA CONDITION**

- WESTCENTRAL BAY OF BENGAL: ROUGH TO VERY ROUGH SEA CONDITION IS PREVAILING AND WILL CONTINUE TILL 25<sup>TH</sup> OCTOBER. IT IS LIKELY TO IMPROVE GRADUALLY THEREAFTER.
- ADJOINING EASTCENTRAL BAY OF BENGAL: MODERATE TO ROUGH SEA CONDITION IS PREVAILING AND LIKELY TILL 24<sup>TH</sup> OCTOBER. IT IS LIKELY TO IMPROVE GRADUALLY THEREAFTER.
- ADJOINING SOUTHWEST BAY OF BENGAL: MODERATE TO ROUGH SEA CONDITION IS PREVAILING AND LIKELY TILL 1800 UTC OF 22ND OCTOBER. IT IS LIKELY TO IMPROVE GRADUALLY THEREAFTER.
- NORTH BAY OF BENGAL:
  - ROUGH SEA CONDITION IS LIKELY ON  $23^{RD}$  AND BECOMING VERY ROUGH TO HIGH FROM  $24^{TH}$  AND VERY ROUGH ON  $25^{TH}$  OCTOBER.
- ALONG & OFF ODISHA, WEST BENGAL, BANGLADESH AND NORTH MYANMAR COASTS: ROUGH SEA CONDITION IS LIKELY ON 23<sup>RD</sup> AND BECOMING ROUGH TO VERY ROUGH SEA CONDITION FROM 24<sup>TH</sup> TO 25<sup>TH</sup> OCTOBER.

## **REMARKS:**

#### **ARABIAN SEA:**

MADDEN JULIAN OSCILLATION INDEX IS IN PHASE 8 WITH AMPLITUDE LESS THAN 1. IT WOULD CONTINUE IN SAME PHASE DURING NEXT 4 DAYS. SEA SURFACE TEMPERATURE IS 28-30°C OVER WESTCENTRAL ARABIAN SEA. THE TROPICAL

CYCLONE HEAT POTENTIAL IS AROUND 20-30 KJ/CM<sup>2</sup> OVER WESTCENTRAL ARABIAN SEA NEAR THE SYSTEM LOCATION AND ALSO ALONG & OFF OMAN-YEMEN COASTS. THE LOW LEVEL POSITIVE VORTICITY IS AROUND 200 X10<sup>-6</sup>S<sup>-1</sup> TO THE SOUTH OF THE SYSTEM CENTER WITH VERTICAL EXTENSION UPTO 200 HPA LEVEL. THE POSITIVE LOW LEVEL CONVERGENCE IS ABOUT 20X10<sup>-5</sup>S<sup>-1</sup> TO THE SOUTH OF SYSTEM CENTER. POSITIVE UPPER LEVEL DIVERGENCE IS ABOUT 30 X10<sup>-5</sup> S<sup>-1</sup> AROUND THE SYSTEM CENTRE. WIND SHEAR IS LOW TO MODERATE (10-15 KNOTS) OVER SYSTEM AREA AND ALONG THE EXPECTED TRACK.

EXISTING FEATURES INDICATE THAT THE SYSTEM IS IN FAVOURABLE ENVIRONMENT AND HENCE IT IS LIKELY TO MAINTAIN ITS INTENSITY TILL  $23^{\rm RD}/0000$  UTC. THEREAFTER, IT WOULD ENTER AN AREA OF LOW OCEAN THERMAL ENERGY AND DRY COLD AIR INCURSION INTO THE CORE FROM ARABIAN PENINSULAR REGION.

MOST OF THE MODELS ARE INDICATING THE SYSTEM TO CROSS YEMEN (EXCEPT IMD GEFS). IMD MULTI MODEL GUIDANCE IS ALSO INDICATING LANDFALL OVER YEMEN. MOST OF THE MODELS ARE INDICATING WEAKENING PRIOR TO LANDFALL. THIS IS SUPPORTED BY DECREASING OCEAN THERMAL ENERGY AND INCREASING WIND SHEAR AND COLD DRY AIR ENTRAINMENT WHEN SYSTEM WILL APPROACH COAST.

IN VIEW OF ABOVE, THE EXTREMELY SEVERE CYCLONIC STORM "TEJ" (PRONOUNCED AS TEJ) IS VERY LIKELY TO MOVE NORTHWESTWARDS AND CROSS YEMEN COAST CLOSE TO AL GHAIDAH (YEMEN) DURING 1800 – 2100 UTC OF 23<sup>RD</sup> OCTOBER AS A VERY SEVERE CYCLONIC STORM WITH WIND SPEED OF 125-135 KMPH GUSTING TO 150 KMPH (70 KNOTS GUSTING 80 KNOTS).

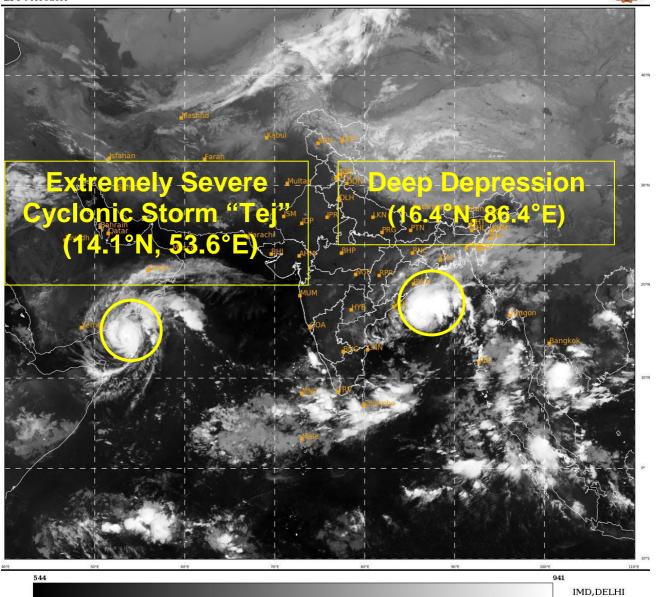
#### **BAY OF BENGAL:**

MJO IS NOT SUPPORTIVE FOR CYCLOGENESIS OVER BOB. HOWEVER, WARM SST AND LOW TO MODERATE VERTICAL WIND SHEAR OVER SOUTH & CENTRAL BOB ARE LIKELY TO SUPPORT THE DEVELOPMENT OF DEEP DEPRESSION OVER BOB. THE GLOBAL MODELS ARE IN AGREEMENT THAT THE DEEP DEPRESSION OVER WESTCENTRAL BAY OF BENGAL IS LIKELY TO INTENSIFY INTO A CYCLONIC STORM AROUND 1200 UTC OF 23<sup>RD</sup> OCTOBER 2023. THERE IS CONSENSUS AMONG VARIOUS MODELS WRT MOVEMENT TOWARDS BANGLADESH.

CONSIDERING ALL THESE, THE DEEP DEPRESSION OVER WESTCENTRAL BAY OF BENGAL IS VERY LIKELY TO INTENSIFY FURTHER INTO A CYCLONIC STORM DURING NEXT 24 HOURS. IT IS LIKELY TO MOVE NEARLY NORTHWARDS TILL 0000 UTC OF  $23^{\rm RD}$  OCTOBER, THEN NORTH-NORTHEASTWARDS AND CROSS BANGLADESH COAST BETWEEN KHEPUPARA AND CHITTAGONG AROUND 1200 UTC OF  $25^{\rm TH}$  OCTOBER AS A DEEP DEPRESSION.

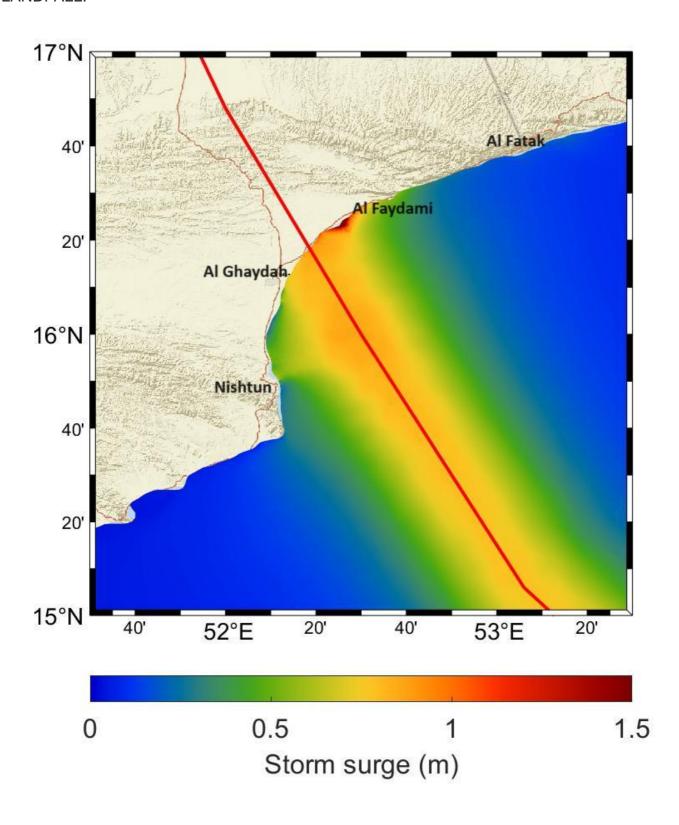
(AMIT BHARDWAJ) SCIENTIST-C RSMC, NEW DELHI





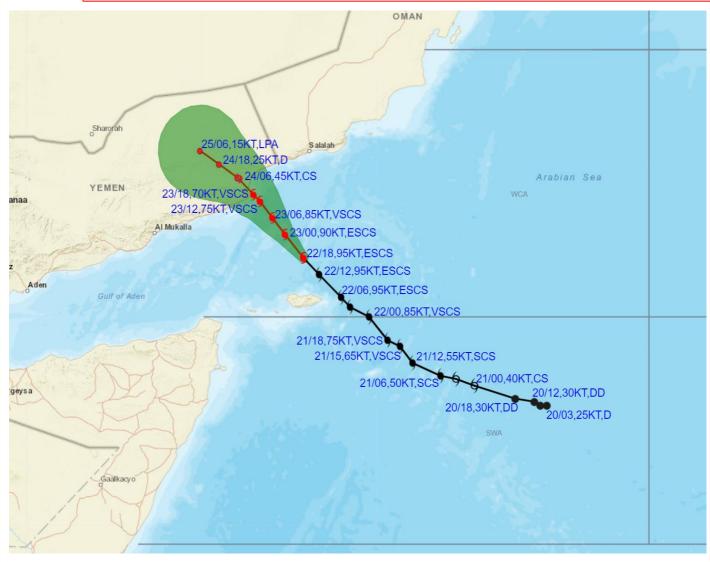
#### STORM SURGE GUIDANCE:

STORM SURGE OF ABOUT 2 METER HEIGHT ABOVE THE ASTRONOMICAL TIDE IS LIKELY TO INUNDATE LOW LYING AREAS BETWEEN AL GHAYDAH AND AL FAYDAMI NEAR THE LANDFALL POINT AT THE TIME OF LANDFALL.





OBSERVED AND FORECAST TRACK ALONGWITH CONE UNCERTAINITY OF EXTREMELY SEVERE CYCLONIC STORM "TEJ" OVER WESTCENTRAL ARABIAN SEA BASED ON 1800 UTC OF 22ND OCTOBER 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)

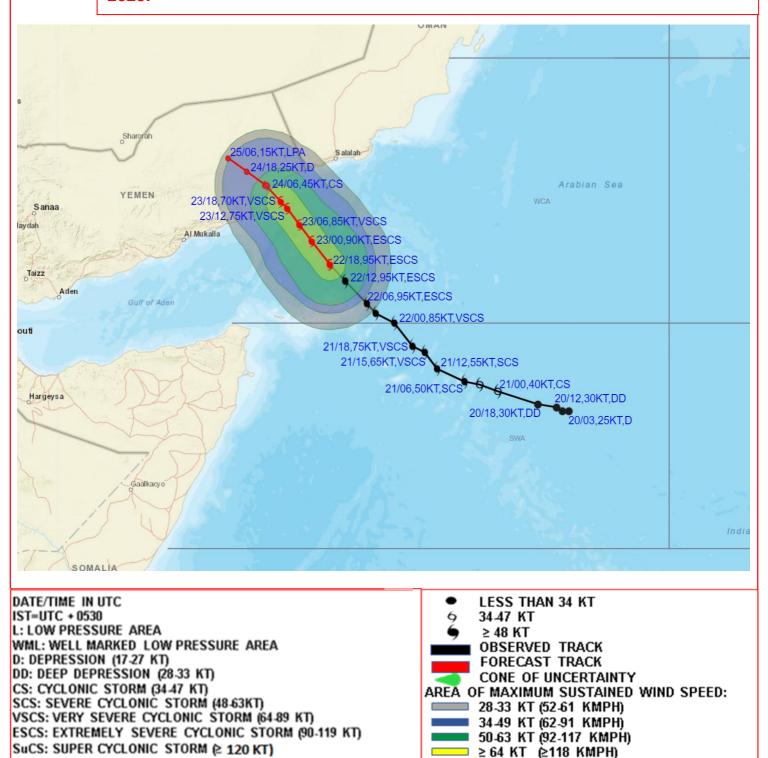
ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)

Sucs: SUPER CYCLONIC STORM ≥ 120 KT)

•	LESS THAN 34 KT
9	34-47 KT
9	≥ 48 KT
	OBSERVED TRACK
	FORECAST TRACK
	CONE OF UNCERTAINTY

Forecast	DISTANCE(KM) AND DIRECTION FROM STATIONS			
Date and Time	SOCOTRA	SALALAH	AL-GHAIDAH	
23.10.23/1800	390, NNW	250, SW	50, SSE	
24.10.23/1800	530, NNW	310, W	110, WNW	

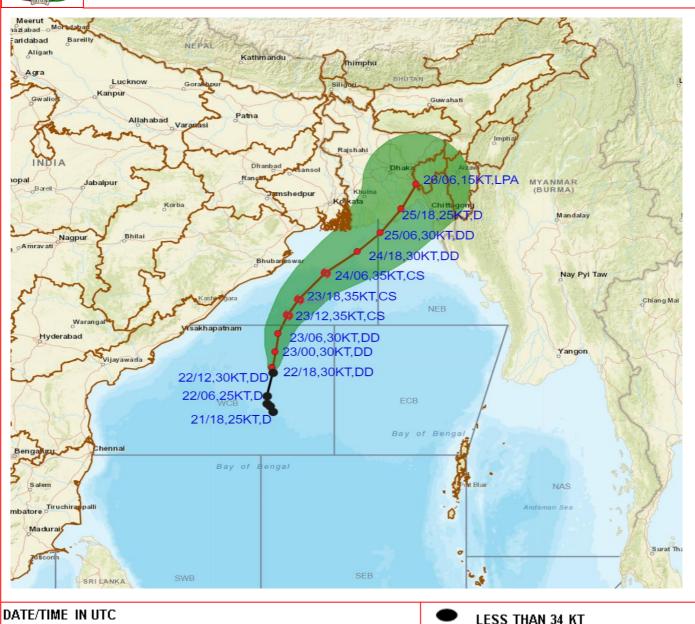
OBSERVED AND FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION OF EXTREMELY SEVERE CYCLONIC STORM "TEJ" OVER WESTCENTRAL ARABIAN SEA BASED ON 1800 UTC OF  $22^{ND}$  OCTOBER 2023.



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		



# OBSERVED AND FORECAST TRACK ALONGWITH CONE OF UNCERTAINITY OF DEEP DEPRESSION OVER WESTCENTRAL BAY OF BENGAL BASED ON 1800 UTC OF 22<sup>ND</sup> OCTOBER 2023.



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)

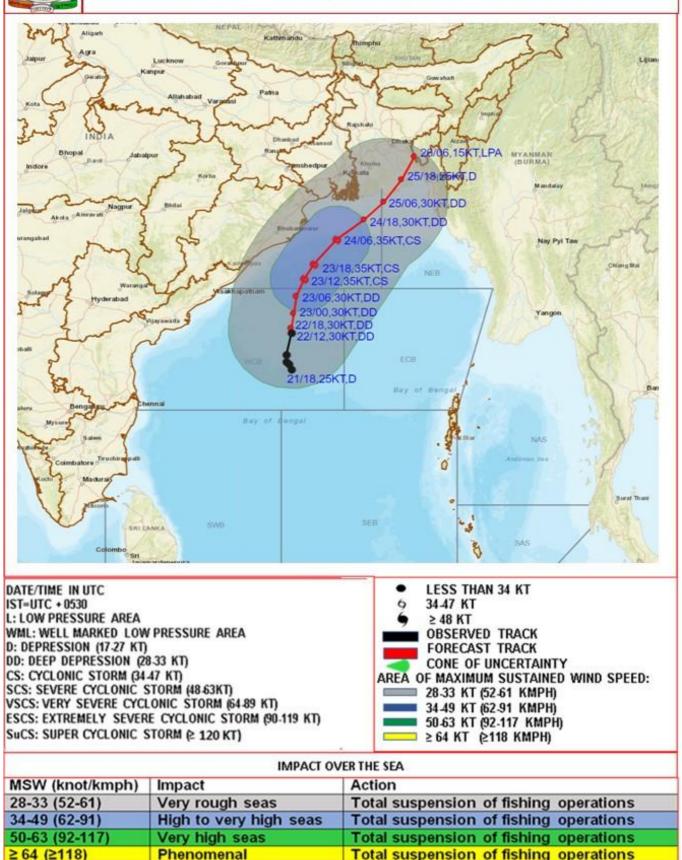
ESCS: EXTREMELY SEVERE CYCLONIC STORM (90-119 KT)

SuCS: SUPER CYCLONIC STORM € 120 KT)





OBSERVED AND FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION OF DEEP DEPRESSION OVER WESTCENTRAL BAY OF BENGAL BASED ON 1800 UTC (2330 IST) OF 22<sup>ND</sup> OCTOBER 2023.



#### **FISHERMEN WARNING GRAPHICS**

