



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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 02.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 02.12.2019 BASED ON 1200 UTC OF 02.12.2019.**

**SUB: (A) DEPRESSION OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN & (B) LOW PRESSURE AREA OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA.**

**(A) DEPRESSION OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN:**

LATEST SATELLITE IMAGERIES INDICATE THAT A DEPRESSION HAS FORMED OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN AND LAY CENTRED AT 1200 UTC OF TODAY, THE 02<sup>ND</sup> DECEMBER, 2019 NEAR LATITUDE 5.7°N AND LONGITUDE 56.6°E, ABOUT 820 KM SOUTH-SOUTHEAST OF SOCOTRA (41494), 1020 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY GRADUALLY INTO A CYCLONIC STORM DURING NEXT 48 HOURS. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 72 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
02.12.19/1200	5.7/56.6	40-50 GUSTING TO 60	DEPRESSION
02.12.19/1800	6.0/56.6	40-50 GUSTING TO 60	DEPRESSION
03.12.19/0000	6.1/56.6	50-60 GUSTING TO 70	DEEP DEPRESSION
03.12.19/0600	6.2/56.5	50-60 GUSTING TO 70	DEEP DEPRESSION
03.12.19/1200	6.4/56.4	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/0000	6.7/56.0	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/1200	7.0/55.7	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/0000	7.4/54.9	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/1200	7.7/53.3	70-80 GUSTING TO 90	CYCLONIC STORM

**(B) LOW PRESSURE AREA OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA.**

A LOW PRESSURE AREA LIES OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA. IT IS LIKELY TO BECOME MORE MARKED DURING NEXT 24 HOURS AND CONCENTRATE INTO A DEPRESSION DURING SUBSEQUENT 24 HOURS.

**REMARKS:**

(1) SATELLITE IMAGES INDICATE INCREASE IN CONVECTION AND INCREASED ORGANISATION OF CLOUDS AROUND THE SYSTEM CENTRE DURING PAST SIX HRS. AS PER THE SATELLITE IMAGERY OF 1200 UTC ON 02<sup>ND</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.5. CONVECTION IS MORE TO THE NORTHEAST SECTOR OF THE SYSTEM. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EQUATORIAL INDIAN OCEAN AND ADJOINING SOUTHWEST ARABIAN SEA BETWEEN LAT 4.0 °N TO 10.0 °N LONG 52.0 °E TO 60.0 °E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN THE PHASE 1 WITH AMPLITUDE CLOSE TO 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 4 DAYS AND MOVE TO PHASE 2 WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY INCREASED IN PAST 24 HOURS AND IS  $150 \times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10\text{-}20 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $12^\circ \text{ N}$ . SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS 28-  $29^\circ \text{C}$  AND IT DECREASES SLIGHTLY ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 40-60KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK . AS THE SYSTEM IS LYING IN A MARGINALLLY FAVOURABLE CONDITIONS IT IS LIKELY TO FURTHER INTENSIFY INTO A CYCLONIC STORM BY 1200 UTC OF 03<sup>RD</sup> DECEMBER.

AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALI COAST FOR THE NEXT 72 HOURS. MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECATING SYSTEM (GEFS) AGREE WITH THE ABOVE ANALYSIS.

(II) SATELLITE IMAGES INDICATE BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHEAST ARABIAN SEA AND ADJOINING LAKSHADWEEP AREA BETWEEN LAT  $8.5^\circ \text{N}$  TO  $13.0^\circ \text{N}$  LONG  $70.5^\circ \text{E}$  TO  $75.0^\circ \text{E}$  IN ASSOCIATION WITH A LOW LEVEL CIRCULATION (LLC) OVEER THE AREA.

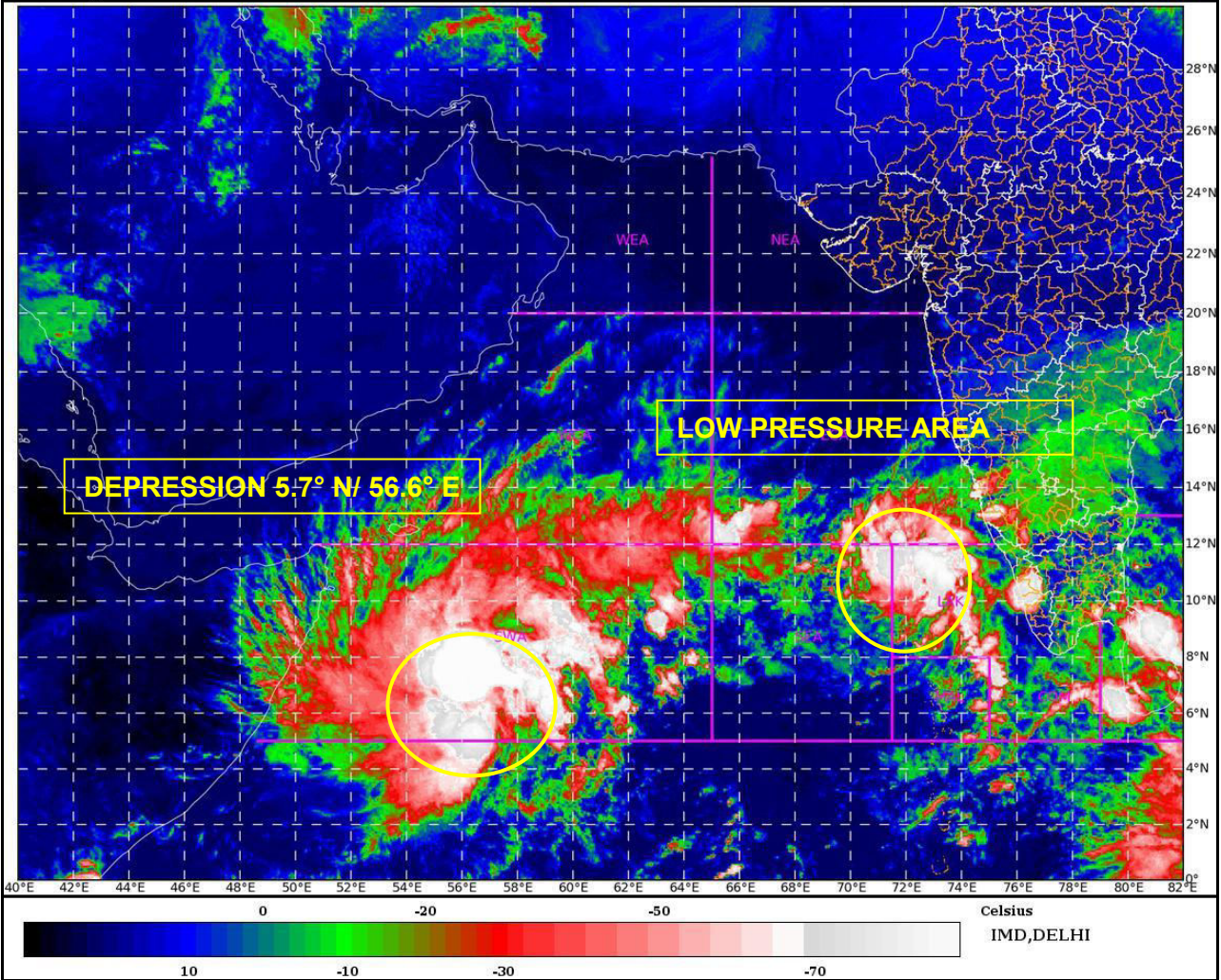
THE LOW LEVEL RELATIVE VORTICITY IS  $50\text{-}60 \times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM AREA. POSITIVE VORTICITY IS EXTENDING UPTO 500 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10\text{-}20 \times 10^{-5} \text{S}^{-1}$  OVER LAKSHDWEEP AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  . THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $18^\circ \text{ N}$ . TROPICAL CYCLONE HEAT POTENTIAL IS 90-110 KJ/CM2 OVER THE REGION THEREBY FAVORING INTENSIFICATION OF THE LOW PRESSURE AREA.

(NEETHA K GOPAL)  
SCIENTIST-E, RSMC, NEW DELHI

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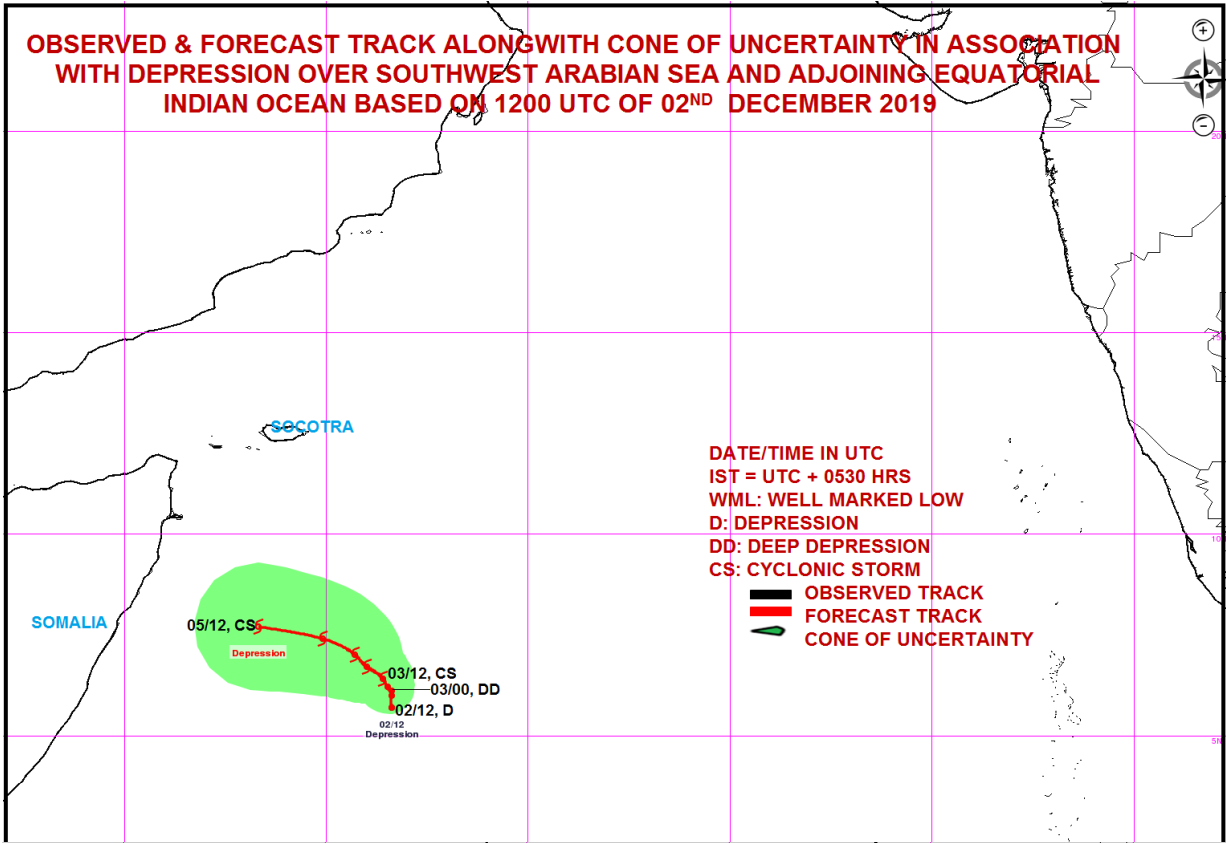
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

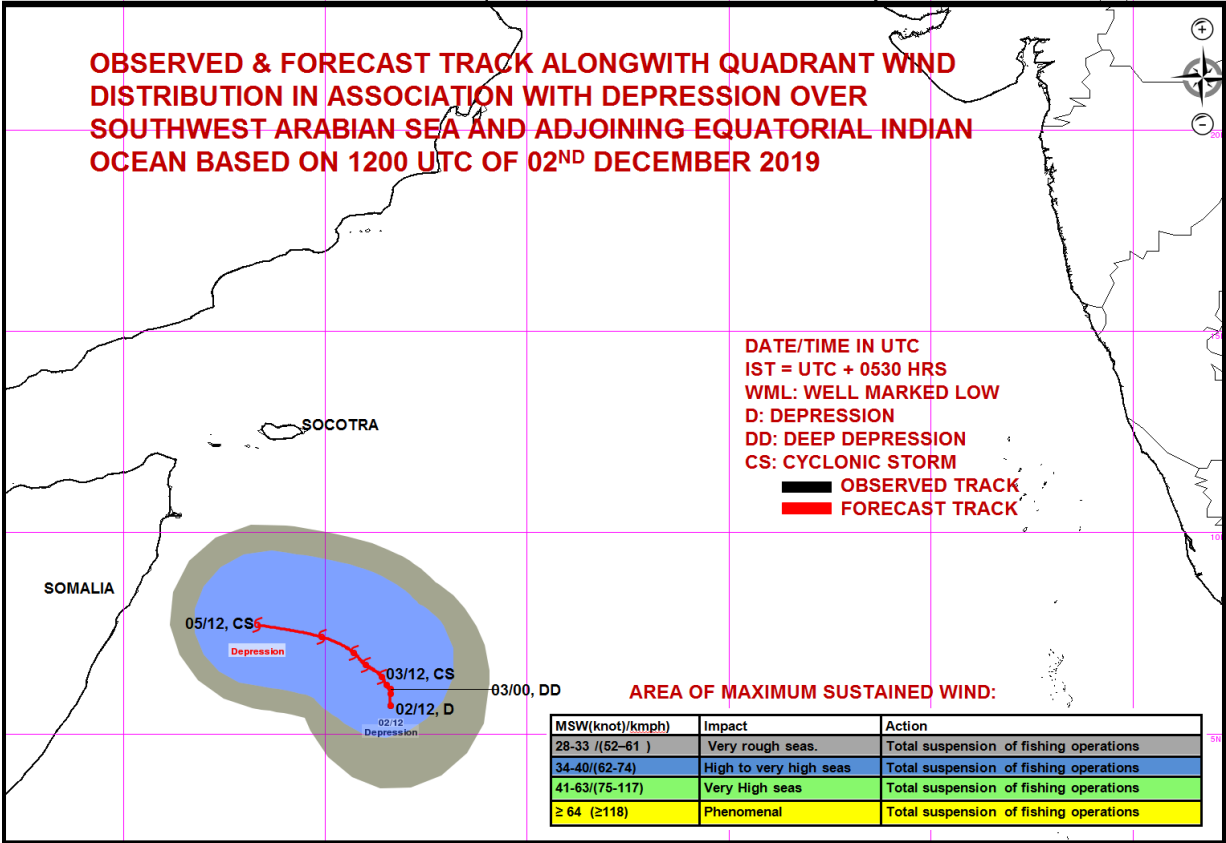


**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH DEPRESSION OVER SOUTHWEST ARABIAN SEA AND ADJOINING EQUATORIAL INDIAN OCEAN BASED ON 1200 UTC OF 02<sup>ND</sup> DECEMBER 2019**



**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH DEPRESSION OVER SOUTHWEST ARABIAN SEA AND ADJOINING EQUATORIAL INDIAN OCEAN BASED ON 1200 UTC OF 02<sup>ND</sup> DECEMBER 2019**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 02.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2000 UTC OF 02.12.2019 BASED ON 1800 UTC OF 02.12.2019.**

**SUB: (A) DEPRESSION OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN & (B) LOW PRESSURE AREA OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA.**

**(A) DEPRESSION OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN:**

THE DEPRESSION OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 07 KMPH DURING THE PAST 06 HOURS AND LAY CENTRED AT 1800 UTC OF 02<sup>ND</sup> DECEMBER, 2019 NEAR LATITUDE 6.1°N AND LONGITUDE 56.5°E, ABOUT 780 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 990 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY GRADUALLY INTO A CYCLONIC STORM DURING NEXT 48 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS INITIALLY AND THEN WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 72 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
02.12.19/1800	6.1/56.5	40-50 GUSTING TO 60	DEPRESSION
03.12.19/0000	6.2/56.5	50-60 GUSTING TO 70	DEEP DEPRESSION
03.12.19/0600	6.3/56.5	50-60 GUSTING TO 70	DEEP DEPRESSION
03.12.19/1200	6.5/56.4	60-70 GUSTING TO 80	CYCLONIC STORM
03.12.19/1800	6.7/56.2	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/0600	6.9/55.9	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/1800	7.3/55.1	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/0600	7.7/53.5	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/1800	7.8/52.9	70-80 GUSTING TO 90	CYCLONIC STORM

**(B) LOW PRESSURE AREA OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA.**

A LOW PRESSURE AREA LIES OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA. IT IS LIKELY TO BECOME MORE MARKED DURING NEXT 24 HOURS AND CONCENTRATE INTO A DEPRESSION DURING SUBSEQUENT 24 HOURS.

**REMARKS:**

(1) AS PER THE SATELLITE IMAGERY OF 1800 UTC ON 02<sup>ND</sup> DECEMBERER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.5. ASSOCITAED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 5.0 °N TO 10.0 °N LONG 53.0 °E TO 60.0 °E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

AROUND THE SYSTEM CENTRE.

THE MJO LIES IN THE PHASE 1 WITH AMPLITUDE CLOSE TO 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 4 DAYS AND MOVE TO PHASE 2 WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY INCREASED IN PAST 24 HOURS AND IS  $150 \times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10-20 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $12^\circ \text{N}$ . SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS 28- 29°C AND IT DECREASES SLIGHTLY ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 40-60KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK . AS THE SYSTEM IS LYING IN A MARGINALLLY FAVOURABLE CONDITIONS IT IS LIKELY TO FURTHER INTENSIFY INTO A CYCLONIC STORM BY 1200 UTC OF 03<sup>RD</sup> DECEMBER.

AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALI COAST FOR THE NEXT 72 HOURS. MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECATING SYSTEM (GEFS) AGREE WITH THE ABOVE ANALYSIS.

(II) SATELLITE IMAGES INDICATE BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA BETWEEN LAT  $9.0^\circ \text{N}$  TO  $13.5^\circ \text{N}$  LONG  $70.0^\circ \text{E}$  TO  $75.0^\circ \text{E}$  IN ASSOCIATION WITH A LOW LEVEL CIRCULATION (LLC) OVEER THE AREA. MINIMUM CLOUDTOP TEMPERATURE IS MINUS 93 DEG C.

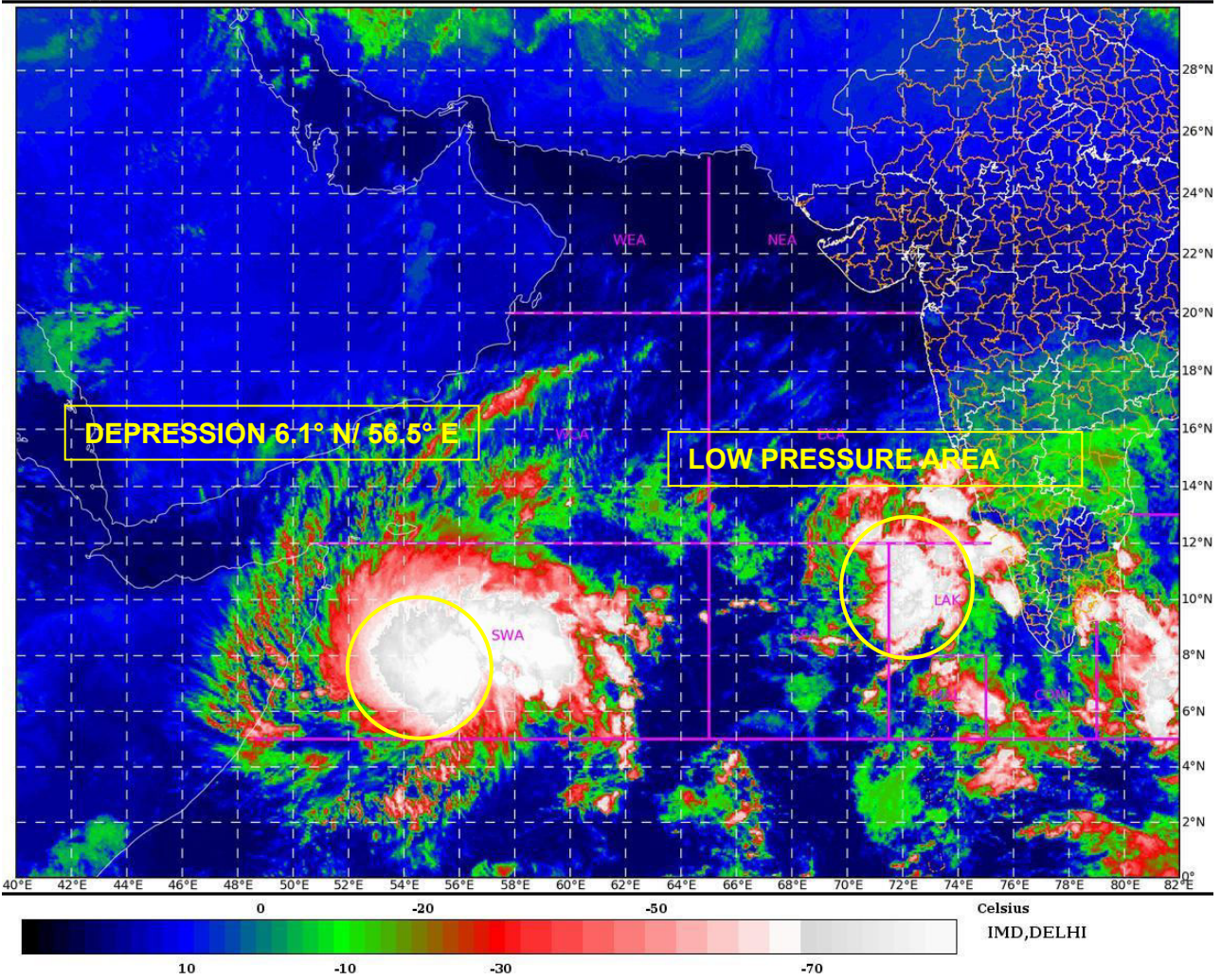
THE LOW LEVEL RELATIVE VORTICITY IS  $50-60 \times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM AREA. POSITIVE VORTICITY IS EXTENDING UPTO 500 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10-20 \times 10^{-5} \text{S}^{-1}$  OVER LAKSHDWEAP AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  . THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $18^\circ \text{N}$ . TROPICAL CYCLONE HEAT POTENTIAL IS 90-110 KJ/CM2 OVER THE REGION THEREBY FAVORING INTENSIFICATION OF THE LOW PRESSURE AREA.

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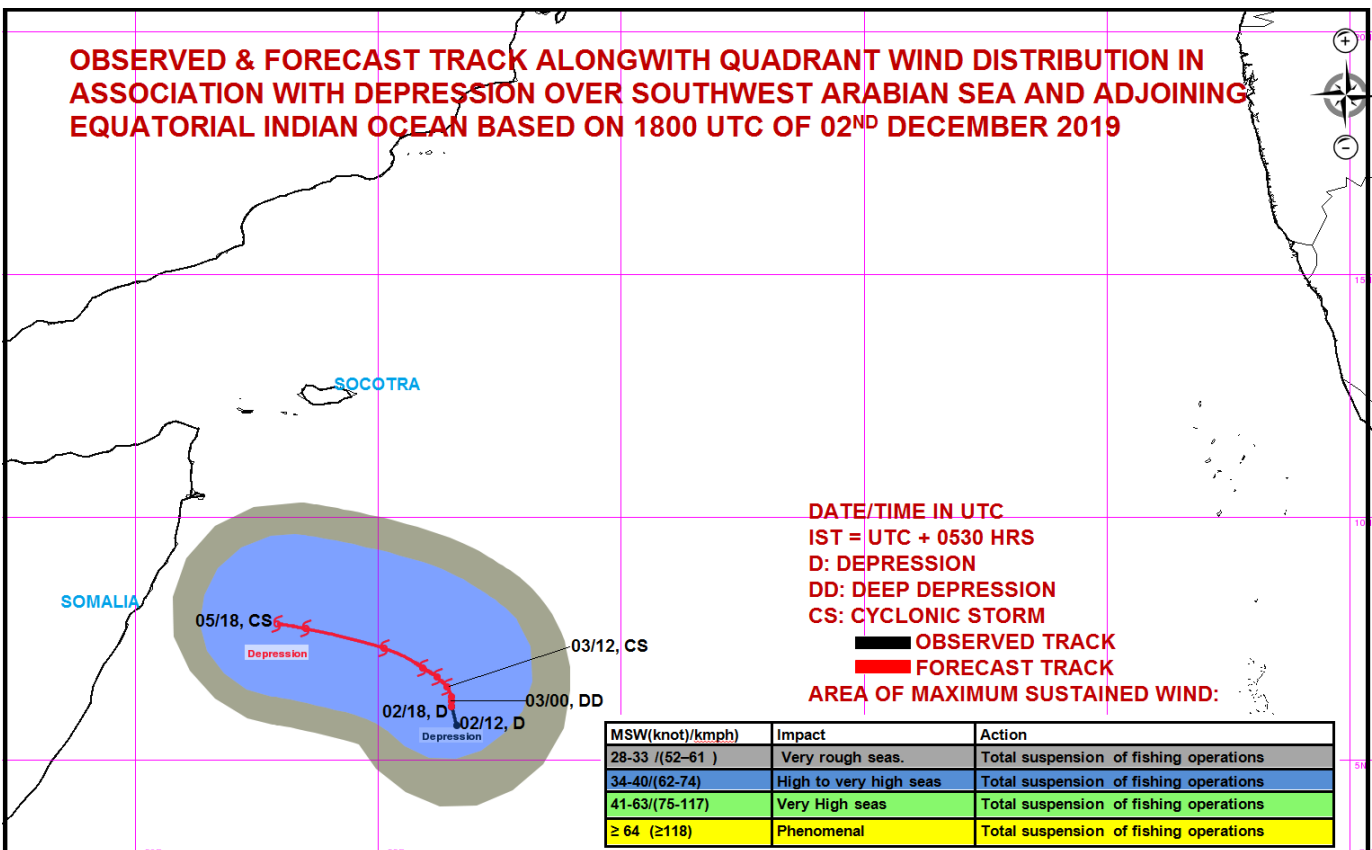
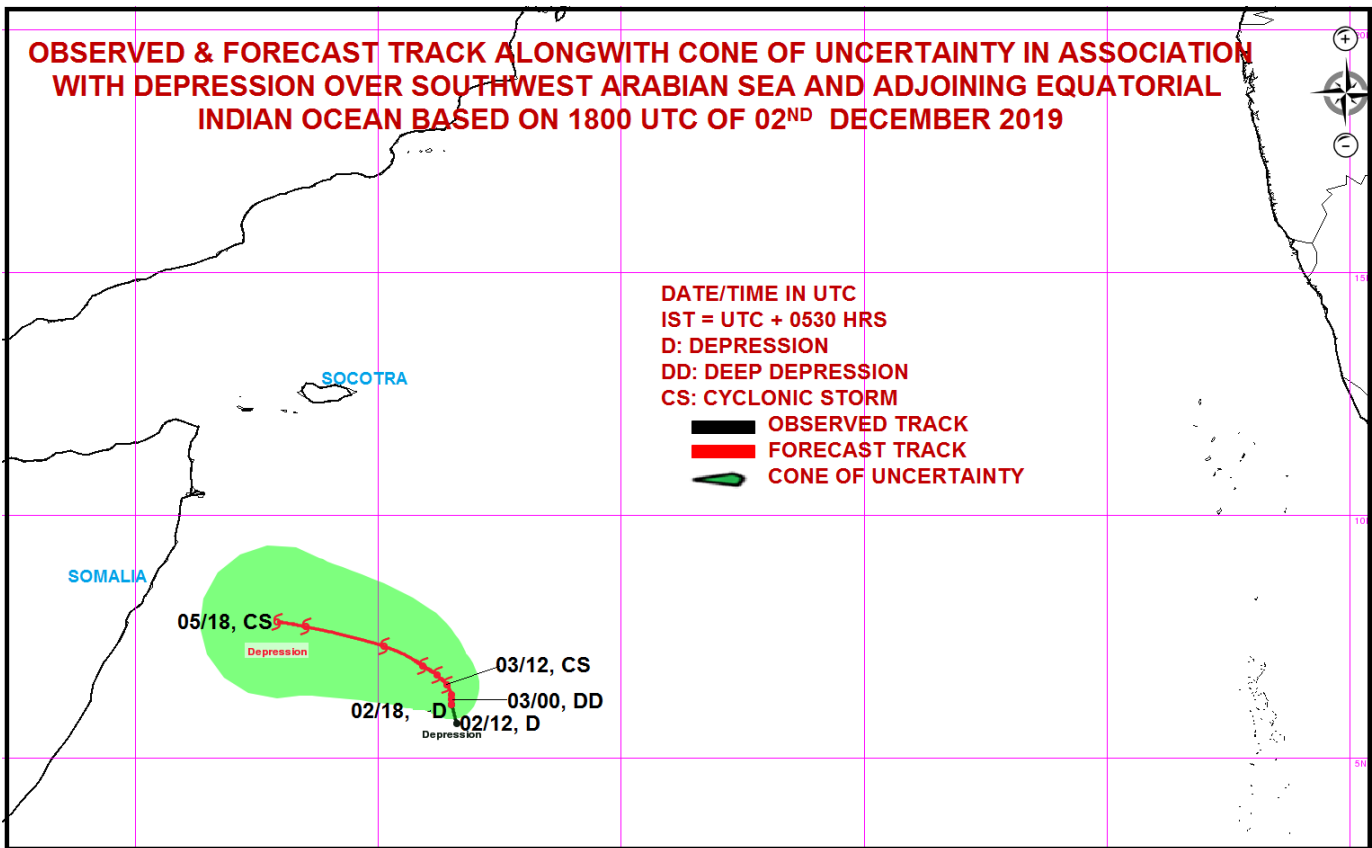
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**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**





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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 03.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0300 UTC OF 03.12.2019 BASED ON 0000 UTC OF 03.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN &  
(B) LOW PRESSURE AREA OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA.**

**(A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN:**

THE DEPRESSION OVER **SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN** MOVED NORTHWESTWARDS WITH A SPEED OF 07 KMPH DURING THE PAST 06 HOURS, INTENSIFIED INTO A DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN AND LAY CENTRED AT 0000 UTC OF TODAY, THE 03<sup>RD</sup> DECEMBER, 2019 NEAR LATITUDE 6.5°N AND LONGITUDE 56.5°E, ABOUT 740 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 960 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS INITIALLY AND THEN WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 4 DAYS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

<b>DATE/TIME(UTC)</b>	<b>POSITION (LAT. °N/ LONG. °E)</b>	<b>MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)</b>	<b>CATEGORY OF CYCLONIC DISTURBANCE</b>
03.12.19/0000	6.5/56.5	50-60 GUSTING TO 70	DEEP DEPRESSION
03.12.19/0600	6.5/56.5	55-65 GUSTING TO 75	DEEP DEPRESSION
03.12.19/1200	6.6/56.5	60-70 GUSTING TO 80	CYCLONIC STORM
03.12.19/1800	6.8/56.4	65-75 GUSTING TO 85	CYCLONIC STORM
04.12.19/0000	7.0/56.3	70-80 GUSTING TO 90	CYCLONIC STORM
04.12.19/1200	7.3/56.1	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/0000	7.9/55.3	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/1200	8.3/53.9	55-65 GUSTING TO 75	DEEP DEPRESSION
06.12.19/0000	7.5/51.7	40-50 GUSTING TO 60	DEPRESSION
06.12.19/1200	6.6/49.5	35-45 GUSTING TO 55	DEPRESSION

**(B) LOW PRESSURE AREA OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA.**

THE LOW PRESSURE AREA OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA PERSISTS. IT IS LIKELY TO BECOME MORE MARKED DURING NEXT 12 HOURS AND CONCENTRATE INTO A DEPRESSION DURING SUBSEQUENT 24 HOURS.

**REMARKS:**

(1) AS PER THE SATELLITE IMAGERY OF 0000 UTC ON 03<sup>RD</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 5.5°N TO 11.0°N LONG 53.0°E TO 60.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN THE PHASE 1 WITH AMPLITUDE CLOSE TO 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 4 DAYS AND MOVE TO PHASE 2 WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY INCREASED IN PAST 24 HOURS AND IS  $150 \times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10\text{-}20 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $12^\circ \text{N}$ . SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS  $28\text{-}29^\circ \text{C}$  AND IT DECREASES SLIGHTLY ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS  $40\text{-}60 \text{KJ}/\text{CM}^2$  OVER THE SYSTEM AREA AND DECREASES TO LESS THAN  $50 \text{KJ}/\text{CM}^2$  ALONG THE FORECAST TRACK . AS THE SYSTEM IS LYING IN A MARGINALLY FAVOURABLE CONDITIONS IT IS LIKELY TO FURTHER INTENSIFY INTO A CYCLONIC STORM BY 1200 UTC OF 03<sup>RD</sup> DECEMBER.

AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 04 DAYS. MAJORITY OF NUMERICAL MODELS INCLUDING ECMWF, NCMRWF UNIFIED MODELS (NCUM), NCMRWF ENSEMBLE PREDICTION SYSTEM (NEPS), IMD GLOBAL FORECAST SYSTEM (GFS), NCEP GFS, GLOBAL ENSEMBLE FORECASTING SYSTEM (GEFS) AGREE WITH THE ABOVE ANALYSIS.

(II) SATELLITE IMAGES INDICATE BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA BETWEEN  $9.0^\circ \text{N}$  TO  $13.5^\circ \text{N}$  LONG  $70.0^\circ \text{E}$  TO  $75.0^\circ \text{E}$  IN ASSOCIATION WITH A LOW LEVEL CIRCULATION (LLC) OVER THE AREA. MINIMUM CLOUD TOP TEMPERATURE IS MINUS  $93 \text{ DEG C}$ .

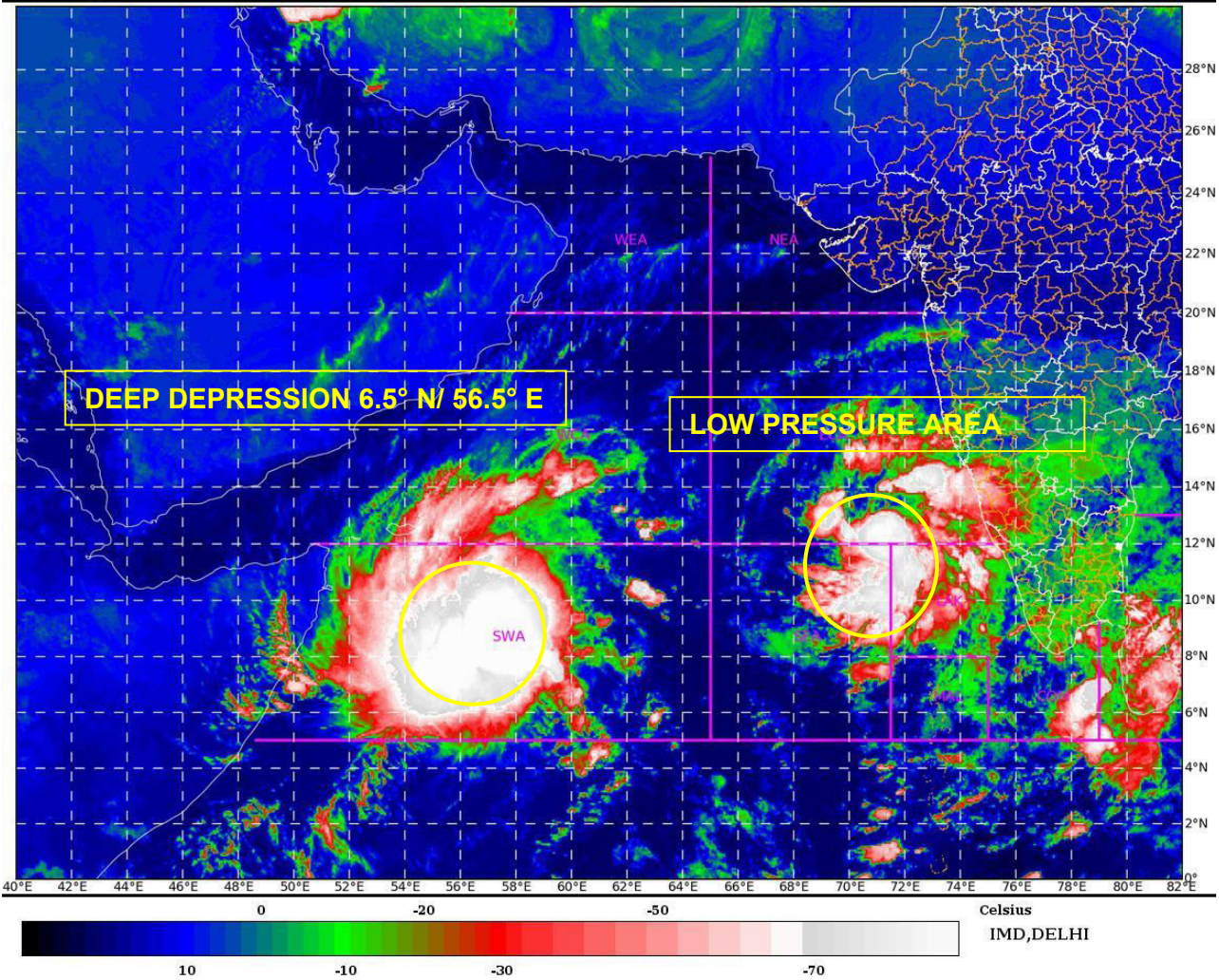
THE LOW LEVEL RELATIVE VORTICITY IS  $50\text{-}60 \times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM AREA. POSITIVE VORTICITY IS EXTENDING UPTO 500 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10\text{-}20 \times 10^{-5} \text{S}^{-1}$  OVER LAKSHADWEEP AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  . THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $18^\circ \text{N}$ . TROPICAL CYCLONE HEAT POTENTIAL IS  $90\text{-}110 \text{KJ}/\text{CM}^2$  OVER THE REGION THEREBY FAVORING INTENSIFICATION OF THE LOW PRESSURE AREA.

(SUNITHA DEVI. S)  
SCIENTIST-E, RSMC, NEW DELHI

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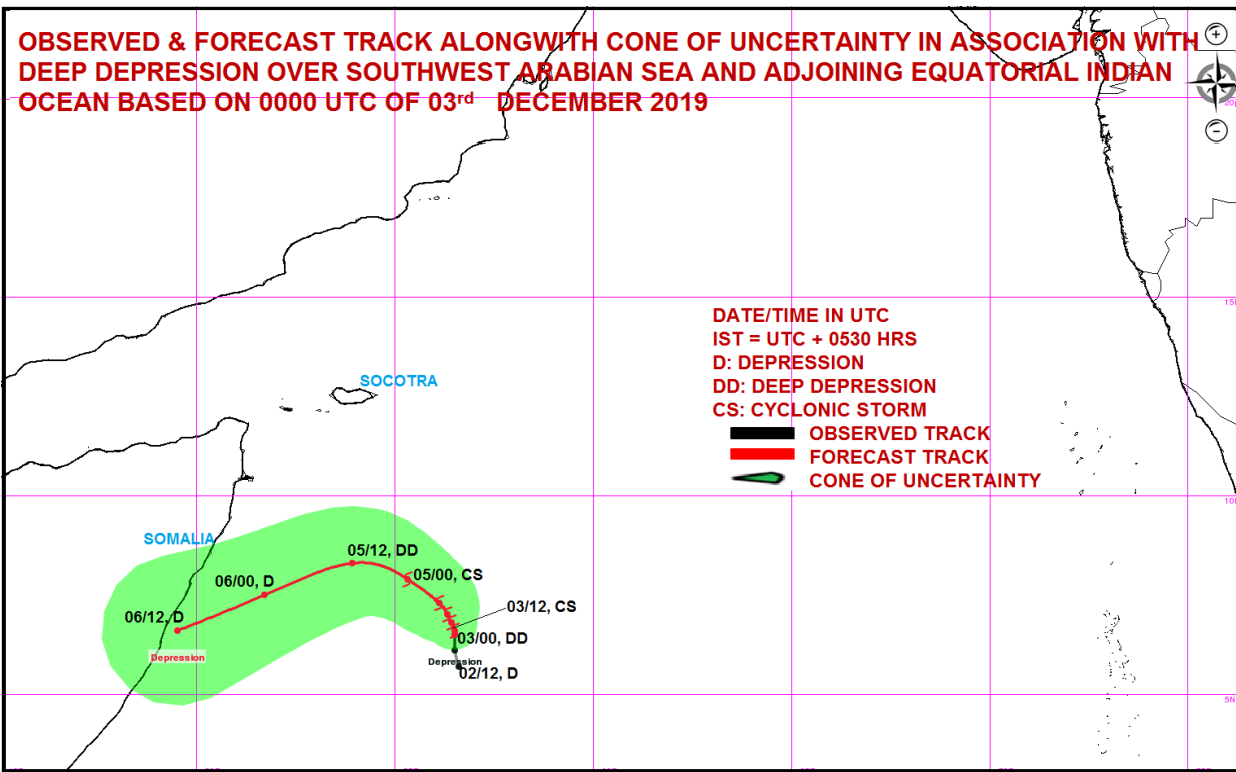
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

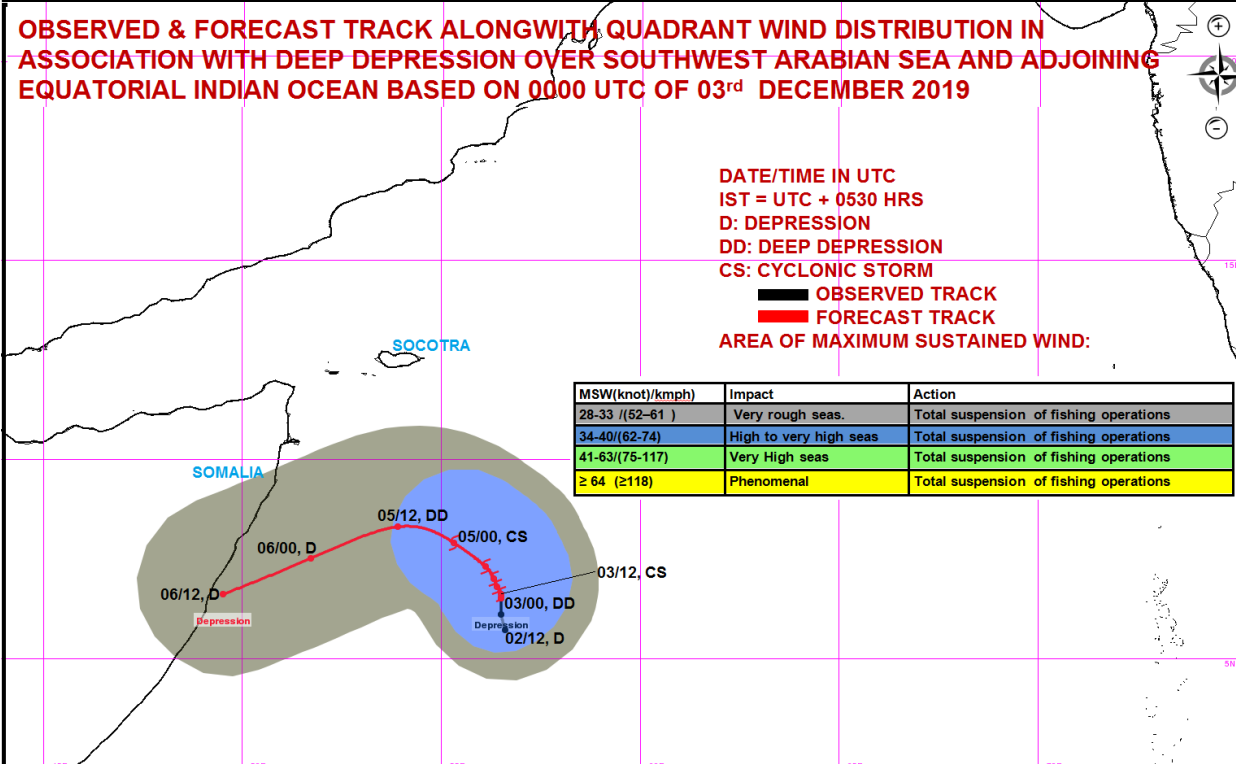


**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY IN ASSOCIATION WITH DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA AND ADJOINING EQUATORIAL INDIAN OCEAN BASED ON 0000 UTC OF 03<sup>rd</sup> DECEMBER 2019**



**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA AND ADJOINING EQUATORIAL INDIAN OCEAN BASED ON 0000 UTC OF 03<sup>rd</sup> DECEMBER 2019**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 03.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0600 UTC OF 03.12.2019 BASED ON 0300 UTC OF 03.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

**(B) WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST ARABIAN SEA AND ADJOINING AREAS OF EASTCENTRAL ARABIAN SEA & LAKSHADWEEP AREA**

**(A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA & ADJOINING EQUATORIAL INDIAN OCEAN MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 08 KMPH DURING PAST 06 HRS AND LAY CENTRED AT 0300 UTC OF TODAY, THE 03<sup>RD</sup> DECEMBER, 2019 NEAR LATITUDE 6.7°N AND LONGITUDE 56.3°E OVER SOUTHWEST ARABIAN SEA, ABOUT 710 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 930 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS INITIALLY AND THEN WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 4 DAYS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
03.12.19/0300	6.7/56.3	50-60 GUSTING TO 70	DEEP DEPRESSION
03.12.19/0600	6.8/56.2	55-65 GUSTING TO 75	DEEP DEPRESSION
03.12.19/1200	6.9/56.1	60-70 GUSTING TO 80	CYCLONIC STORM
03.12.19/1800	7.0/56.1	65-75 GUSTING TO 85	CYCLONIC STORM
04.12.19/0000	7.1/56.0	70-80 GUSTING TO 90	CYCLONIC STORM
04.12.19/1200	7.4/55.8	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/0000	8.1/55.0	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/1200	8.5/53.6	55-65 GUSTING TO 75	DEEP DEPRESSION
06.12.19/0000	7.7/51.4	40-50 GUSTING TO 60	DEPRESSION
06.12.19/1200	6.8/49.5	35-45 GUSTING TO 55	DEPRESSION

**(B) WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST ARABIAN SEA AND ADJOINING EAST CENTRAL ARABIAN SEA & LAKSHADWEEP AREA.**

THE LOW PRESSURE AREA OVER LAKSHADWEEP AREA AND ADJOINING SOUTHEAST ARABIAN SEA NOW LIES AS A WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST ARABIAN SEA AND ADJOINING AREAS OF EASTCENTRAL ARABIAN SEA & LAKSHADWEEP AREA. IT IS VERY LIKELY TO CONCENTRATE INTO A DEPRESSION DURING NEXT 24 HOURS.

**REMARKS:**

(I) AS PER THE SATELLITE IMAGERY OF 0300 UTC ON 03<sup>RD</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.0. MICROWAVE IMAGERY SHOWS A DISCONTINUOUS CURVED BAND IN THE NORTH OF THE CENTRE WITH TWO DISTINCT INTENSIVE CLOUD MASSES CLOSE TO EACH OTHER. THE OUTFLOW IS NOW MORE CONCENTRATED.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 5.5°N TO 11.0°N LONG 53.0°E TO 60.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN THE PHASE 1 WITH AMPLITUDE CLOSE TO 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 4 DAYS AND MOVE TO PHASE 2 WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY INCREASED IN PAST 24 HOURS AND IS  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $20\text{-}30 \times 10^{-5} \text{S}^{-1}$  TO NORTHWEST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 15° N. SEA SURFACE TEMPERATURE OVER THE SYSTEM AREA IS 27-28°C AND ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 40-60KJ/CM<sup>2</sup> OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM<sup>2</sup> ALONG THE FORECAST TRACK. AS THE SYSTEM IS LYING IN A MOSTLY FAVOURABLE CONDITIONS IT IS LIKELY TO FURTHER INTENSIFY INTO A CYCLONIC STORM BY 1200 UTC OF 03<sup>RD</sup> DECEMBER.

AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 04 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(II) SATELLITE IMAGES INDICATE INTENSITY OF THE VORTEX OVER SOUTHEAST ARABIAN SEA AND ADJOINING LAKSHADWEEP AREA IS T 1.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION BETWEEN LAT 9.0°N TO 13.5°N LONG 70.0°E TO 75.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE LOW LEVEL RELATIVE VORTICITY IS  $50\text{-}60 \times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM AREA. POSITIVE VORTICITY IS EXTENDING UPTO 500 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10\text{-}20 \times 10^{-5} \text{S}^{-1}$  OVER LAKSHADWEEP AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$ . THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 16° N. TROPICAL CYCLONE HEAT POTENTIAL IS 90-110 KJ/CM<sup>2</sup> OVER THE REGION. AS SYSTEM IS LYING OVER A VERY FAVOURABLE ENVIRONMENT, THE WELL MARKED LOW PRESSURE AREA IS VERY LIKELY TO INTENSIFY INTO A DEPRESSION DURING NEXT 24 HOURS. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

(NEETHA K GOPAL)  
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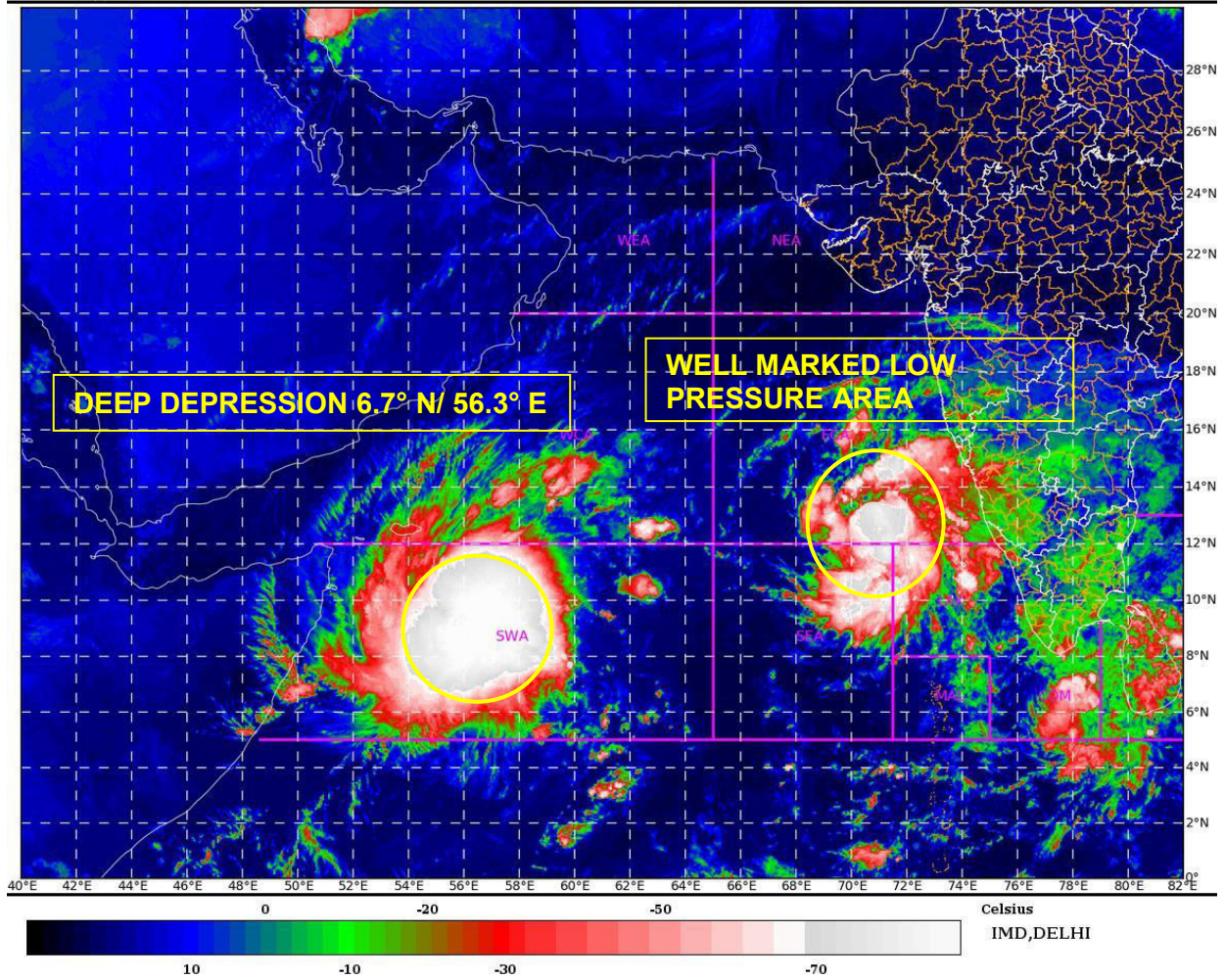
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**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

SAT : INSAT-3DR IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN\_SEA

03-12-2019/(0415 to 0442) GMT  
03-12-2019/(0945 to 1012) IST



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**







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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 03.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0900 UTC OF 03.12.2019 BASED ON 0600 UTC OF 03.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

**(B) WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST ARABIAN SEA AND ADJOINING AREAS OF EASTCENTRAL ARABIAN SEA & LAKSHADWEEP AREA**

**(A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 13 KMPH DURING PAST 06 HRS AND LAY CENTRED AT 0600 UTC OF TODAY, THE 03<sup>RD</sup> DECEMBER, 2019 NEAR LATITUDE 7.2°N AND LONGITUDE 56.3°E OVER SOUTHWEST ARABIAN SEA, ABOUT 660 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 900 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME MORE TIME AND THEN RECURVE WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 04 DAYS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
03.12.19/0600	7.2/56.3	55-65 GUSTING TO 75	DEEP DEPRESSION
03.12.19/1200	7.4/56.2	60-70 GUSTING TO 80	CYCLONIC STORM
03.12.19/1800	7.5/56.1	65-75 GUSTING TO 85	CYCLONIC STORM
04.12.19/0000	7.6/56.0	70-80 GUSTING TO 90	CYCLONIC STORM
04.12.19/0600	7.7/55.8	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/1800	7.9/55.3	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/0600	8.2/54.0	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/1800	8.0/52.4	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/0600	7.6/51.0	50-60 GUSTING TO 70	DEEP DEPRESSION
06.12.19/1800	7.1/49.4	40-50 GUSTING TO 60	DEPRESSION

**(B) WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST ARABIAN SEA AND ADJOINING EAST CENTRAL ARABIAN SEA & LAKSHADWEEP AREA.**

THE WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST ARABIAN SEA AND ADJOINING AREAS OF EASTCENTRAL ARABIAN SEA & LAKSHADWEEP AREA PERSISTS. IT IS VERY LIKELY TO CONCENTRATE INTO A DEPRESSION DURING NEXT 24 HOURS.

**REMARKS:**

(1) AS PER THE SATELLITE IMAGERY OF 0600 UTC ON 03<sup>RD</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 6.0°N TO 14.0°N LONG 52.0°E TO 60.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE. AT 0600 UTC A SHIP LOCATED NEAR LAT. 10.8°N / LONG. 61.7°E REPORTED MEAN SEA LEVEL PRESSURE OF 1010.0 HPA AND EASTERLY WIND WITH SPEED 20 KNOTS.

THE MJO LIES IN THE PHASE 1 WITH AMPLITUDE CLOSE TO 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 4 DAYS AND MOVE TO PHASE 2 WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  TO NORTHWEST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 15° N. SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS 27-28°C AND ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 40-60KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK . AS THE SYSTEM IS LYING IN A MOSTLY FAVOURABLE CONDITIONS IT IS LIKELY TO FURTHER INTENSIFY INTO A CYCLONIC STORM BY 1200 UTC OF 03<sup>RD</sup> DECEMBER.

AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 04 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(II) SATELLITE IMAGES INDICATE INTENSITY OF THE VORTEX OVER SOUTHEAST ARABIAN SEA AND ADJOINING LAKSHADWEEP AREA IS T 1.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION BETWEEN LAT 8.0<sup>0</sup>N TO 16.0<sup>0</sup>N LONG 68.0<sup>0</sup>E TO 75.0<sup>0</sup>E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

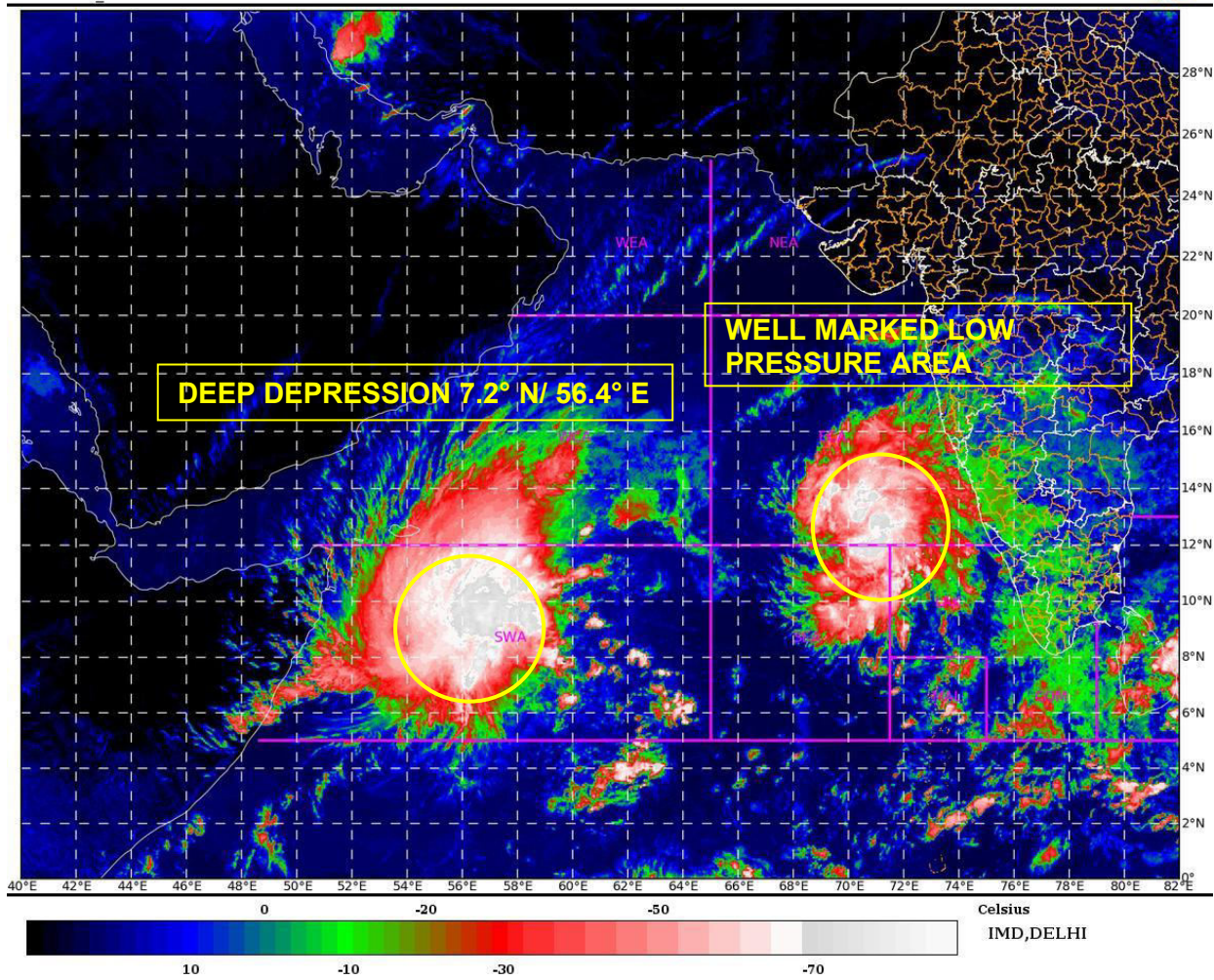
THE LOW LEVEL RELATIVE VORTICITY IS 60-70  $\times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM AREA. POSITIVE VORTICITY IS EXTENDING UPTO 500 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 10-15  $\times 10^{-5} \text{S}^{-1}$  OVER LAKSHDWEAP AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$ . THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 16° N. TROPICAL CYCLONE HEAT POTENTIAL IS 90-110 KJ/CM2 OVER THE REGION. AS SYSTEM IS LYING OVER A VERY FAVOURABLE ENVIRONMENT, THE WELL MARKED LOW PRESSURE AREA IS VERY LIKELY TO INTENSIFY INTO A DEPRESSION DURING NEXT 24 HOURS. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

(NEETHA K GOPAL)  
SCIENTIST-E, RSMC, NEW DELHI

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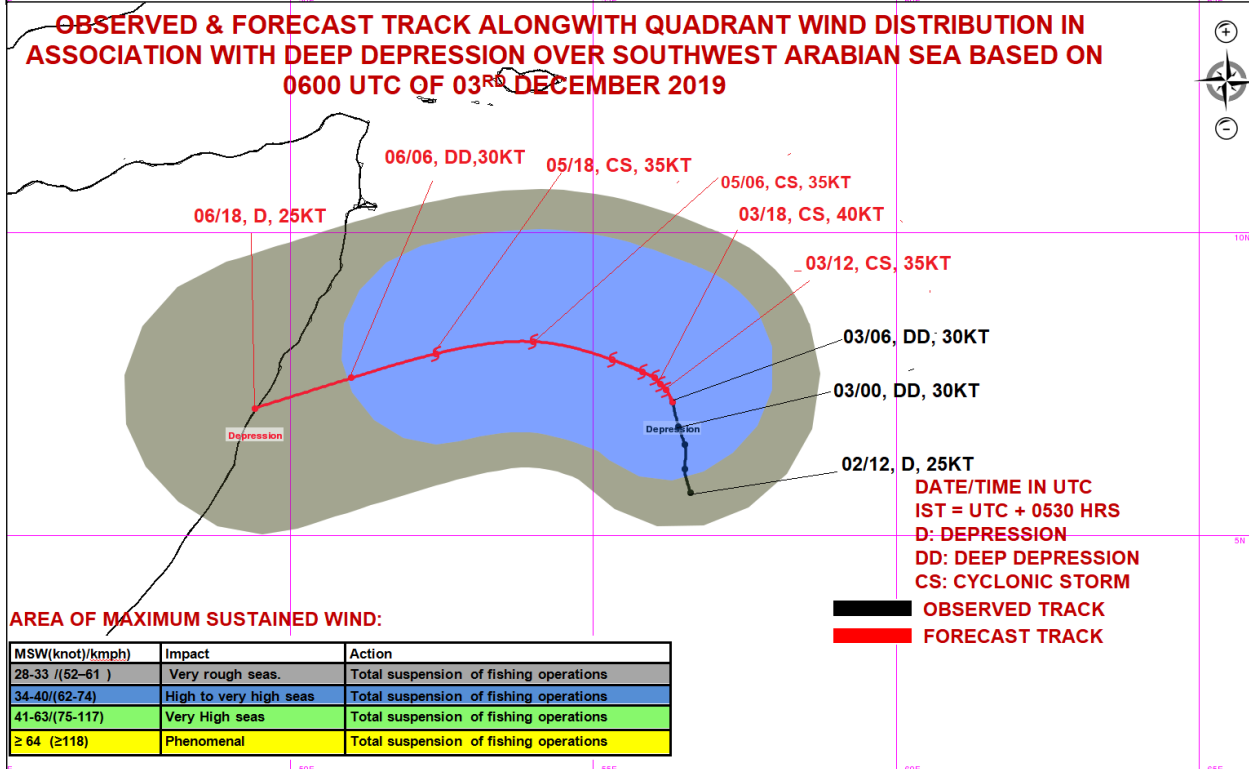
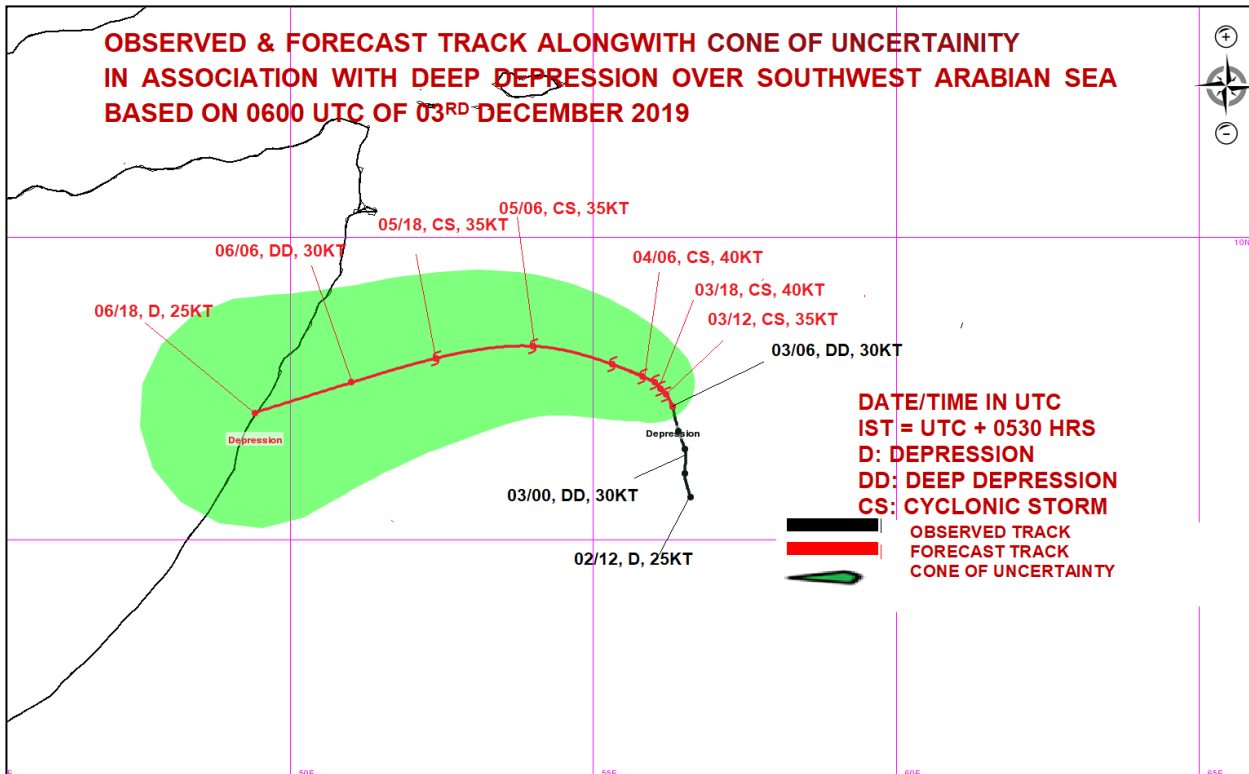
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 03.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 03.12.2019 BASED ON 1200 UTC OF 03.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

**(B) WELL MARKED LOW PRESSURE AREA OVER EASTCENTRAL ARABIAN SEA AND ADJOINING AREAS OF SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA**

**(A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA MOVED SLIGHTLY EASTWARDS WITH A SPEED OF 04 KMPH DURING PAST 06 HRS AND LAY CENTRED AT 1200 UTC OF TODAY, THE 03<sup>RD</sup> DECEMBER, 2019 NEAR LATITUDE 7.2°N AND LONGITUDE 56.5°E OVER SOUTHWEST ARABIAN SEA, ABOUT 670 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 920 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME MORE TIME AND THEN RECURVE WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 04 DAYS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
03.12.19/1200	7.2/56.5	55-65 GUSTING TO 75	DEEP DEPRESSION
03.12.19/1800	6.9/56.7	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/0000	7.0/56.3	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/0600	7.2/56.0	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/1200	7.4/55.6	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0000	7.6/54.6	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/1200	7.8/53.2	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/0000	7.6/51.7	50-60 GUSTING TO 70	DEEP DEPRESSION
06.12.19/1200	7.1/50.2	40-50 GUSTING TO 60	DEPRESSION
07.12.19/0000	6.6/48.6	40-50 GUSTING TO 60	WELL MARKED LOW

**(B) WELL MARKED LOW PRESSURE AREA OVER EASTCENTRAL ARABIAN SEA AND ADJOINING AREAS OF SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA**

THE WELL MARKED LOW PRESSURE AREA OVER SOUTHEAST ARABIAN SEA AND ADJOINING AREAS OF EASTCENTRAL ARABIAN SEA & LAKSHADWEEP AREA LIES OVER SOUTHEAST ARABIAN SEA AND ADJOINING EAST CENTRAL ARABIAN SEA & LAKSHADWEEP AREA. IT IS VERY LIKELY TO CONCENTRATE INTO A DEPRESSION DURING NEXT 24 HOURS.

**REMARKS:**

(I) AS PER THE SATELLITE IMAGERY OF 1200 UTC ON 03<sup>RD</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 6.5°N TO 13.0°N LONG 55.0°E TO 61.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE. AT 1200 UTC A SHIP LOCATED NEAR LAT. 11.0°N / LONG. 65.3°E REPORTED MEAN SEA LEVEL PRESSURE OF 1006.3 HPA AND NORTHEASTERLY WIND WITH SPEED 12 KNOTS.

THE MJO LIES IN THE PHASE 1 WITH AMPLITUDE CLOSE TO 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 4 DAYS AND MOVE TO PHASE 2 WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $15 \times 10^{-5} \text{S}^{-1}$  TO NORTHWEST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 15° N. SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS 27-28°C AND ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 40-60KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK . AS THE SYSTEM IS LYING IN A MOSTLY FAVOURABLE CONDITIONS IT IS LIKELY TO FURTHER INTENSIFY INTO A CYCLONIC STORM BY 1200 UTC OF 04<sup>TH</sup> DECEMBER.

AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 04 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS. ALSO THERE IS LIKELY INTERACTION OF THIS SYSTEM WITH THE CYCLONIC VORTEX ASSOCIATED WITH THE WELL MARKED LOW PRESSURE AREA DISCUSSED UNDER (II).

(II) SATELLITE IMAGES INDICATE INTENSITY OF THE VORTEX OVER SOUTHEAST ARABIAN SEA AND ADJOINING LAKSHADWEEP AREA IS T 1.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION BETWEEN LAT 10.8°N TO 16.0°N LONG 68.0°E TO 73.5°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

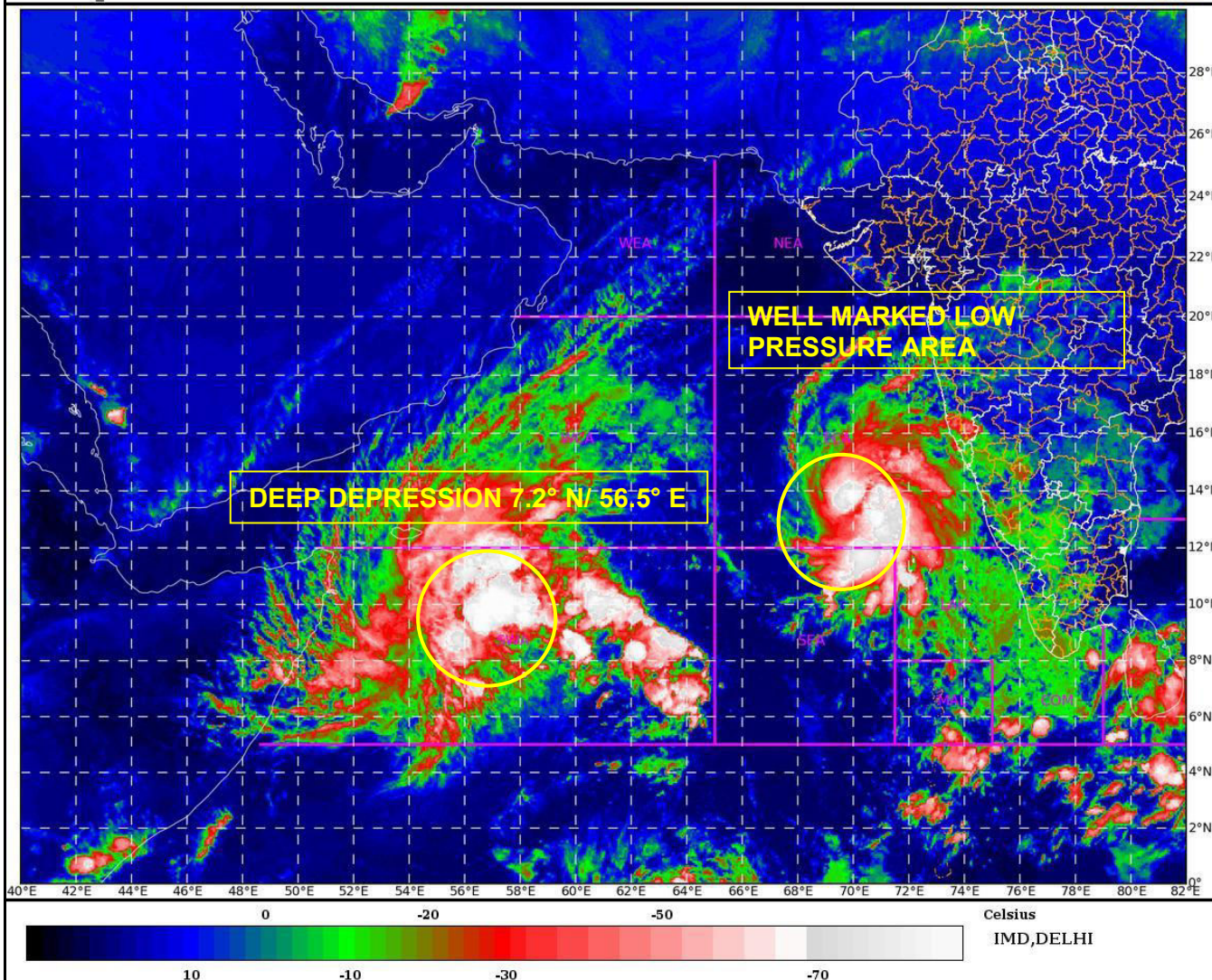
THE LOW LEVEL RELATIVE VORTICITY IS 60-70  $\times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM AREA. POSITIVE VORTICITY IS EXTENDING UPTO 500 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  OVER LAKSHDWEAP AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  . THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 16° N. TROPICAL CYCLONE HEAT POTENTIAL IS 90-110 KJ/CM2 OVER THE REGION. AS SYSTEM IS LYING OVER A VERY FAVOURABLE ENVIRONMENT, THE WELL MARKED LOW PRESSURE AREA IS VERY LIKELY TO INTENSIFY INTO A DEPRESSION DURING NEXT 24 HOURS. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

(SUNITHA DEVI.S)  
SCIENTIST-E, RSMC, NEW DELHI

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**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

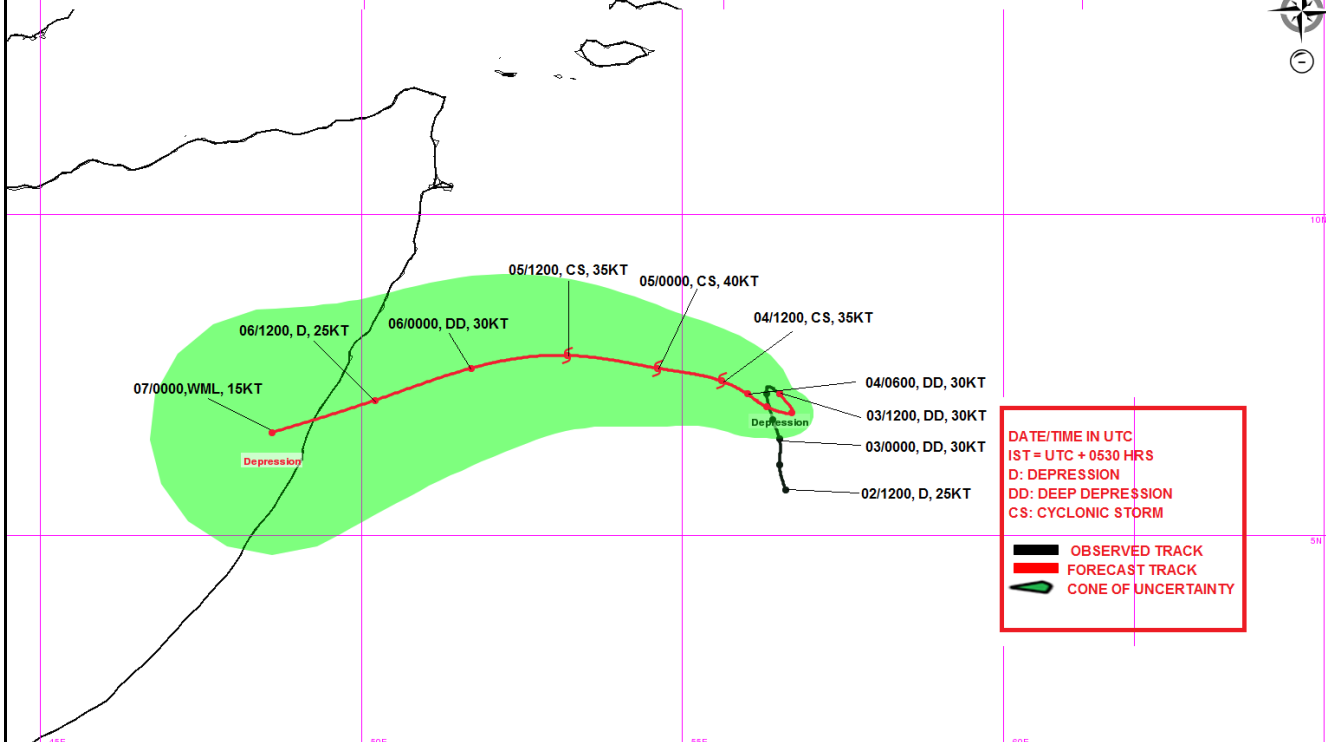
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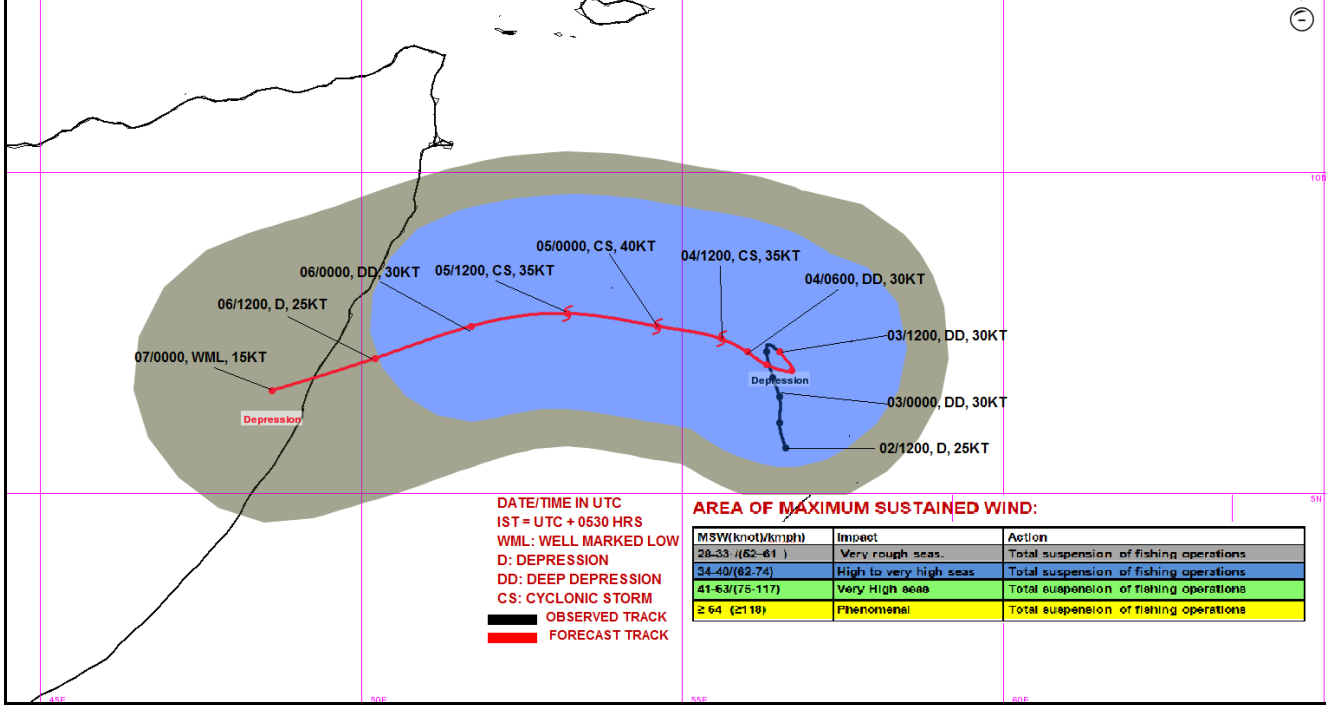
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

**OBSERVED AND FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY IN ASSOCIATION WITH DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA BASED ON 1200 UTC OF 03<sup>rd</sup> DECEMBER, 2019**



**OBSERVED & FORECAST TRACK ALONG WITH QUADRANT WIND DISTRIBUTION IN ASSOCIATION WITH DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA BASED ON 1200 UTC OF 03<sup>rd</sup> DECEMBER, 2019**



DATE/TIME IN UTC  
 IST = UTC + 0530 HRS  
 WML: WELL MARKED LOW  
 D: DEPRESSION  
 DD: DEEP DEPRESSION  
 CS: CYCLONIC STORM  
 — OBSERVED TRACK  
 — FORECAST TRACK

**AREA OF MAXIMUM SUSTAINED WIND:**

MSW(knot/kmph)	Impact	Action
28-33 (62-64)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations
41-63 (75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**





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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 03.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2100 UTC OF 03.12.2019 BASED ON 1800 UTC OF 03.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

**(B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA AND ADJOINING AREAS OF SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA**

**(A) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA MOVED SOUTH-EASTWARDS WITH A SPEED OF 04 KMPH DURING PAST 06 HRS AND LAY CENTRED AT 1800 UTC OF 03<sup>RD</sup> DECEMBER, 2019 NEAR LATITUDE 7.0°N AND LONGITUDE 56.6°E OVER SOUTHWEST ARABIAN SEA, ABOUT 690 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 920 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME MORE TIME AND THEN RECURVE WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 04 DAYS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
03.12.19/1800	7.0/56.6	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/0000	7.1/56.3	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/0600	7.2/56.0	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/1200	7.4/55.6	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/1800	7.5/55.1	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0600	7.7/53.9	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/1800	7.7/52.5	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/0600	7.4/51.0	50-60 GUSTING TO 70	DEEP DEPRESSION
06.12.19/1800	6.9/49.4	40-50 GUSTING TO 60	DEPRESSION
07.12.19/0600	6.7/48.8	20-30 GUSTING TO 40	WELL MARKED LOW

**(B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA AND ADJOINING AREAS OF SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA**

THE WELL MARKED LOW PRESSURE AREA OVER EASTCENTRAL ARABIAN SEA AND ADJOINING AREAS OF SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA CONCENTRATED INTO A DEPRESSION AND CENTRED AT 1800 UTC OF 03<sup>RD</sup> DECEMBER, 2019 NEAR LATITUDE 12.7°N AND LONGITUDE 71.0°E OVER EASTCENTRAL ARABIAN SEA AND ADJOINING AREAS OF SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA. IT IS VERY LIKELY TO CONCENTRATE INTO A DEEP DEPRESSION DURING NEXT 24 HOURS.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

**REMARKS:**

(I) AS PER THE SATELLITE IMAGERY OF 1800 UTC ON 03<sup>RD</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.5/T2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 9.0<sup>0</sup>N TO 14.5<sup>0</sup>N LONG 54.5<sup>0</sup>E TO 58.5<sup>0</sup>E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN THE PHASE 1 WITH AMPLITUDE CLOSE TO 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 4 DAYS AND MOVE TO PHASE 2 WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $15 \times 10^{-5} \text{S}^{-1}$  TO NORTHWEST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 15° N. SEA SURFACE TEMPERATURE OVER THE SYSTEM AREA IS 27-28°C AND ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 40-60KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK . AS THE SYSTEM IS LYING IN A MOSTLY FAVOURABLE CONDITIONS IT IS LIKELY TO FURTHER INTENSIFY INTO A CYCLONIC STORM BY 1200 UTC OF 04<sup>TH</sup> DECEMBER.

AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 04 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS. ALSO THERE IS LIKELY INTERACTION OF THIS SYSTEM WITH THE CYCLONIC VORTEX ASSOCIATED WITH THE WELL MARKED LOW PRESSURE AREA DISCUSSED UNDER (II).

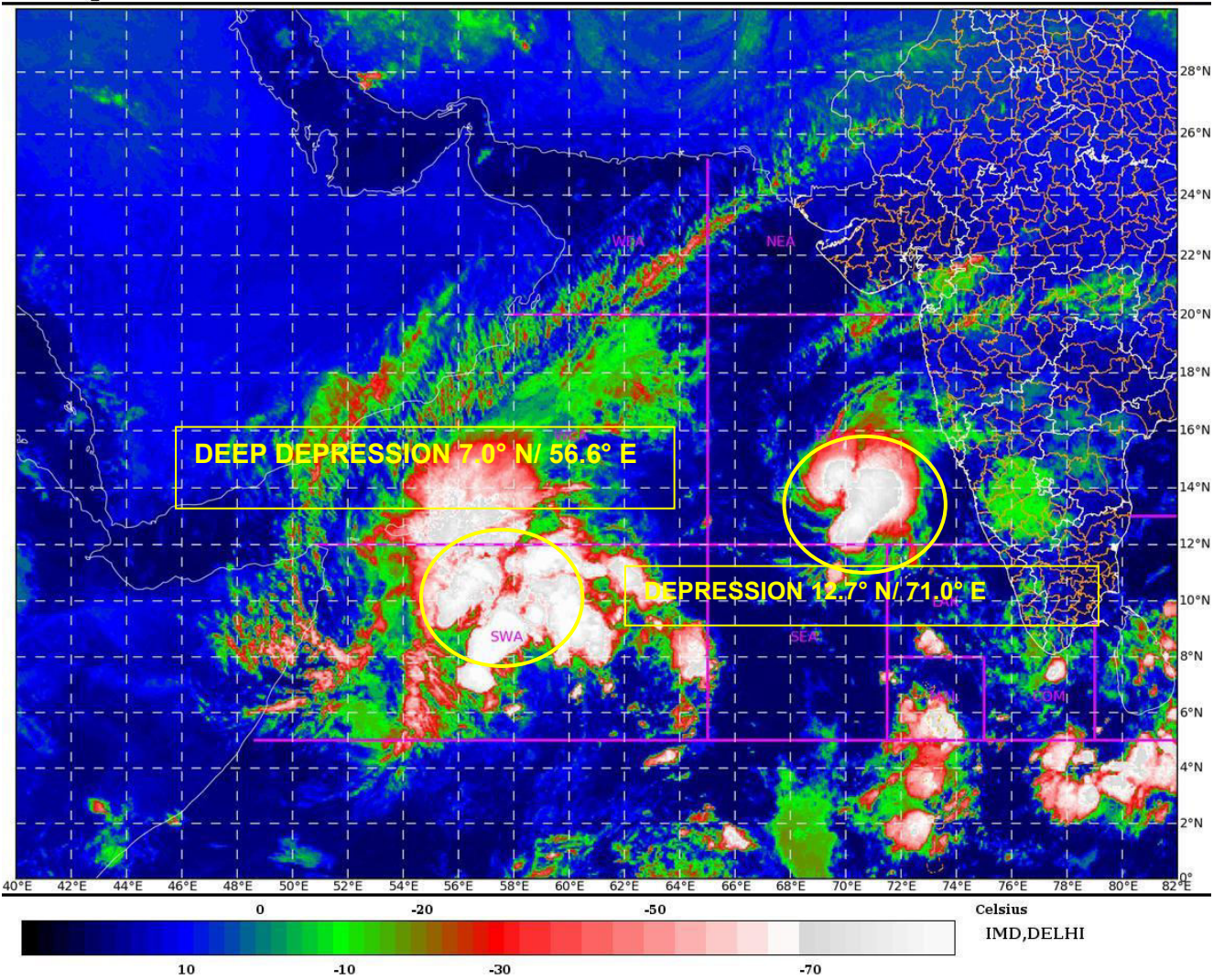
(II) AS PER THE SATELLITE IMAGERY OF 1800 UTC ON 03<sup>RD</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.5. ASSOCIATED BROKEN TO LOW/MED CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION OVER SOUTH EAST ARABIAN SEA ADJOINING LAKSHADWEEP AREA BETWEEN LAT 11.5N TO 15.0N LONG 68.5E TO 72.0E (MINIMUM CTT MINUS 93 DEG CEL) THE LOW LEVEL RELATIVE VORTICITY IS  $60-70 \times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM AREA. POSITIVE VORTICITY IS EXTENDING UPTO 500 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  OVER LAKSHADWEEP AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  . THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 16° N. TROPICAL CYCLONE HEAT POTENTIAL IS 90-110 KJ/CM2 OVER THE REGION. AS SYSTEM IS LYING OVER A VERY FAVOURABLE ENVIRONMENT, THE WELL MARKED LOW PRESSURE AREA IS VERY LIKELY TO INTENSIFY INTO A DEPRESSION DURING NEXT 24 HOURS. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

(V R DURAI)  
SCIENTIST-E, RSMC, NEW DELHI

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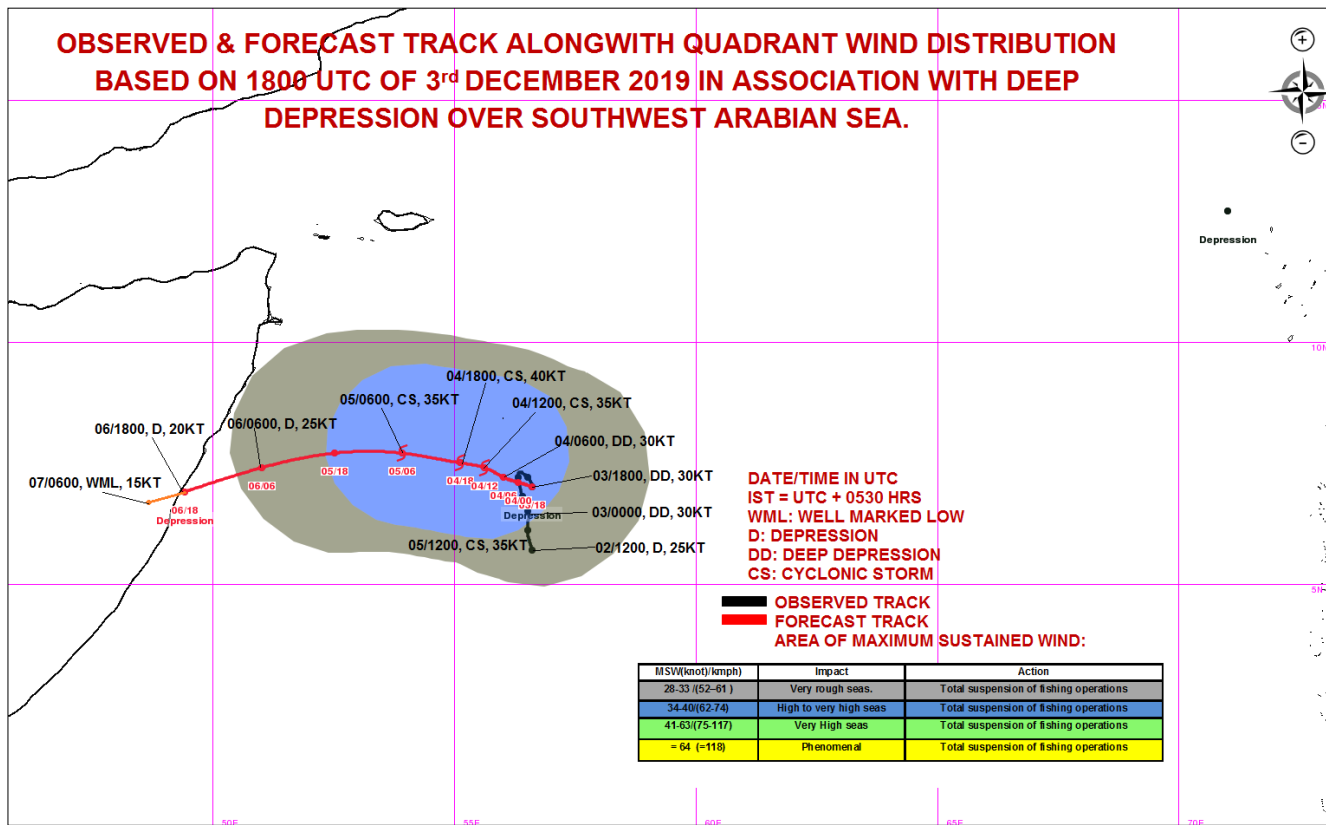
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

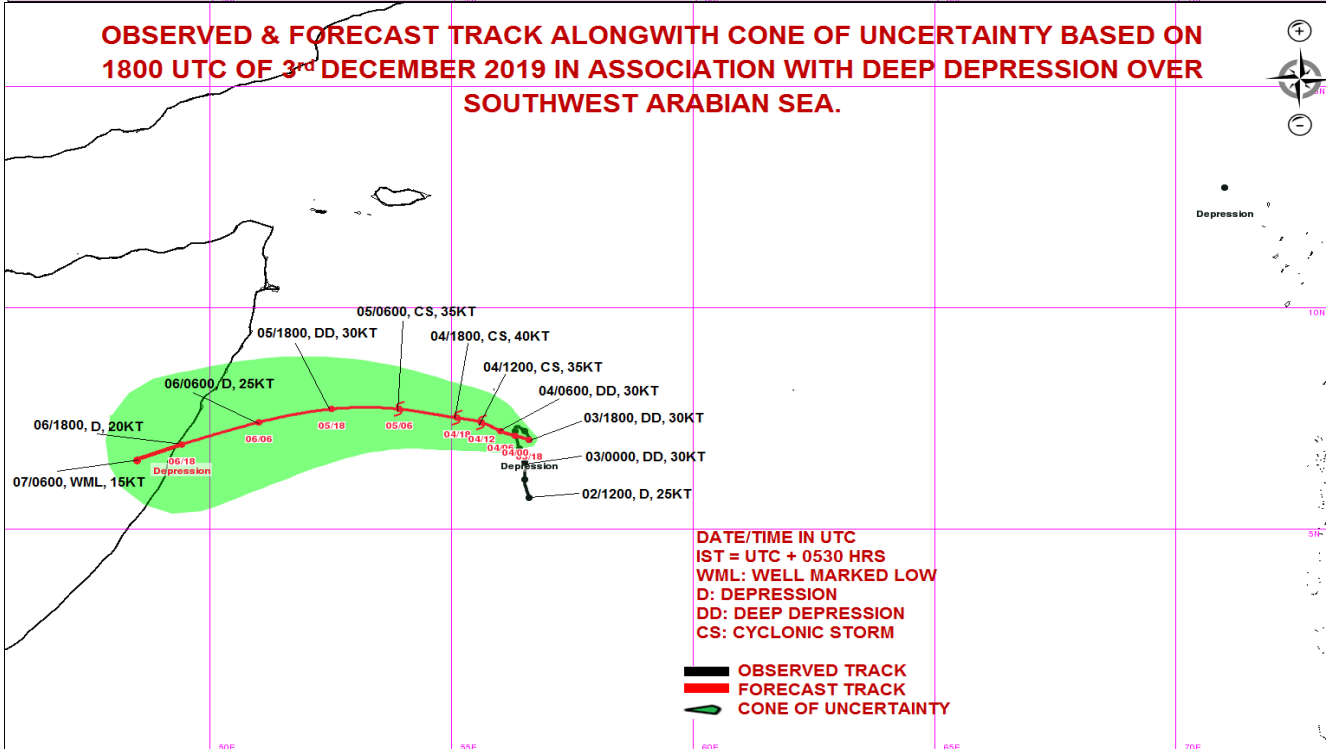


**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION  
BASED ON 1800 UTC OF 3<sup>rd</sup> DECEMBER 2019 IN ASSOCIATION WITH DEEP  
DEPRESSION OVER SOUTHWEST ARABIAN SEA.**



**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY BASED ON  
1800 UTC OF 3<sup>rd</sup> DECEMBER 2019 IN ASSOCIATION WITH DEEP DEPRESSION OVER  
SOUTHWEST ARABIAN SEA.**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 04.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0300 UTC OF 04.12.2019 BASED ON 0000 UTC OF 04.12.2019.**

**SUB: (A) DEPRESSION OVER EASTCENTRAL ARABIAN SEA AND ADJOINING AREAS OF SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA, INTENSIFIED INTO DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA &**

**(B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

**(A) DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA:**

THE DEPRESSION OVER EASTCENTRAL ARABIAN SEA AND ADJOINING AREAS OF SOUTHEAST ARABIAN SEA & LAKSHADWEEP AREA MOVED NORTHWESTWARDS WITH A SPEED OF 30 KMPH DURING PAST 06 HOURS, INTENSIFIED INTO A DEEP DEPRESSION AND LAY CENTRED AT 0000 UTC OF 04<sup>TH</sup> DECEMBER, 2019, OVER EASTCENTRAL ARABIAN SEA, NEAR LATITUDE 14.0°N AND LONGITUDE 70.0°E ABOUT 640 KM SOUTH-SOUTHWEST OF MUMBAI(43003), 440 KM OF WEST-SOUTHWEST OF PANJIM (43192). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS AWAY FROM INDIAN COAST DURING NEXT 48 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/0000	14.0/70.0	50-60 GUSTING TO 70	DEEP DEPRESSION
04.12.19/0600	14.5/69.4	50-60 GUSTING TO 70	DEEP DEPRESSION
04.12.19/1200	14.9/68.8	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/1800	15.3/68.2	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0000	15.6/67.6	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/1200	16.2/66.4	55-65 GUSTING TO 75	DEEP DEPRESSION
06.12.19/0000	16.8/65.2	40-50 GUSTING TO 60	DEPRESSION

**(B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA:**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA REMAINED PRACTICALLY STATIONARY DURING PAST 06 HOURS AND LAY CENTRED AT 0000 HRS UTC OF 04<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.2°N AND LONGITUDE 56.6°E OVER SOUTHWEST ARABIAN SEA, ABOUT 670 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 930 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME MORE TIME AND THEN RECURVE WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 03 DAYS.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/0000	7.2/56.6	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/0600	7.4/56.6	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/1200	7.6/56.5	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/1800	7.8/56.3	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0000	8.0/55.9	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/1200	8.3/54.8	65-75 GUSTING TO 85	CYCLONIC STORM
06.12.19/0000	8.1/53.1	60-70 GUSTING TO 80	DEEP DEPRESSION
06.12.19/1200	7.6/51.1	40-50 GUSTING TO 60	DEPRESSION
07.12.19/0000	6.7/48.3	30-40 GUSTING TO 50	DEPRESSION

**REMARKS:**

(A) AS PER THE SATELLITE IMAGERY OF 0000 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.5/T2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 6.5°N TO 13.5°N LONG 54.5°E TO 61.5°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN THE PHASE 1 WITH AMPLITUDE CLOSE TO 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 4 DAYS AND MOVE TO PHASE 2 WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS 150-200 X10<sup>-5</sup>SEC<sup>-1</sup> TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 20-30 X10<sup>-5</sup>S<sup>-1</sup> TO NORTHWEST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT 20 X10<sup>-5</sup>S<sup>-1</sup> TO THE NORTHWEST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. SEA SURFACE TEMPERATURE OVER THE SYSTEM AREA IS 27-28°C AND ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 80-90KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK . AS THE SYSTEM IS LYING IN A MOSTLY FAVOURABLE CONDITIONS IT IS LIKELY TO FURTHER INTENSIFY INTO A CYCLONIC STORM BY 1200 UTC OF 04<sup>TH</sup> DECEMBER.

AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 04 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(B). AS PER THE SATELLITE IMAGERY OF 0000 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.0. ASSOCIATED BROKEN TO LOW/MED CLOUDS WITH EMBDD INTENSE TO VERY INTENSE CONVECTION OVER SOUTH EAST AR SEA ADJOINING LAKSHADWEEP AREA BETWEEN LAT 11.5N TO 16.0N LONG 68.5E TO 72.0E (MINIMUM CTT MINUS 92 DEG CEL)

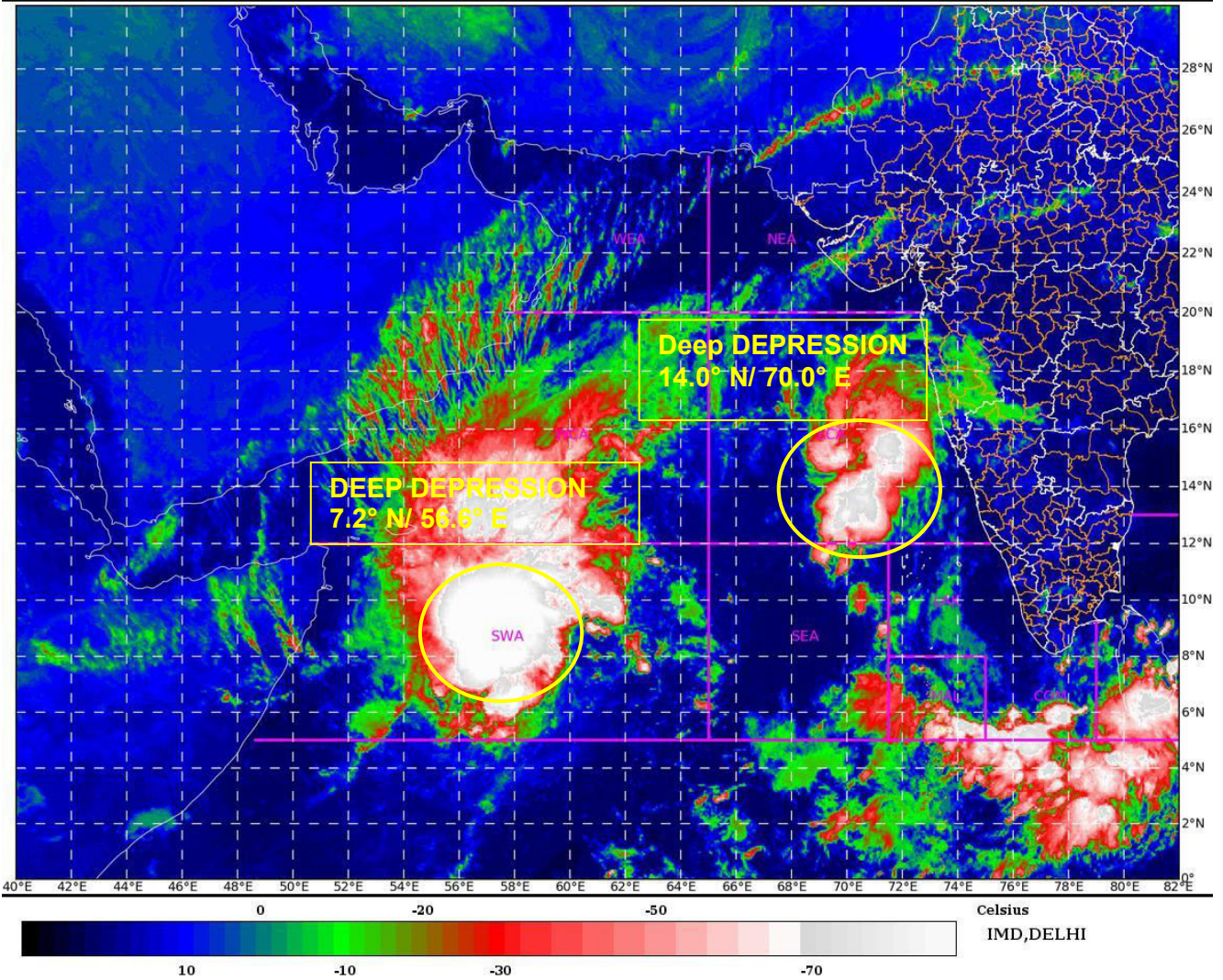
THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS 50-100 X10<sup>-5</sup>SEC<sup>-1</sup> AROUND THE SYSTEM AREA. POSITIVE VORTICITY IS EXTENDING UPTO 500 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT 10 X10<sup>-5</sup>S<sup>-1</sup> OVER LAKSHADWEEP AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT 20-30 X10<sup>-5</sup>S<sup>-1</sup> . THE VERTICAL WIND SHEAR IS LOW TO MODERATE (15-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. TROPICAL CYCLONE HEAT POTENTIAL IS 100-110 KJ/CM2 OVER THE REGION. AS SYSTEM IS LYING OVER A VERY FAVOURABLE ENVIRONMENT, THE DEEP DEPRESSION IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 24 HOURS. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

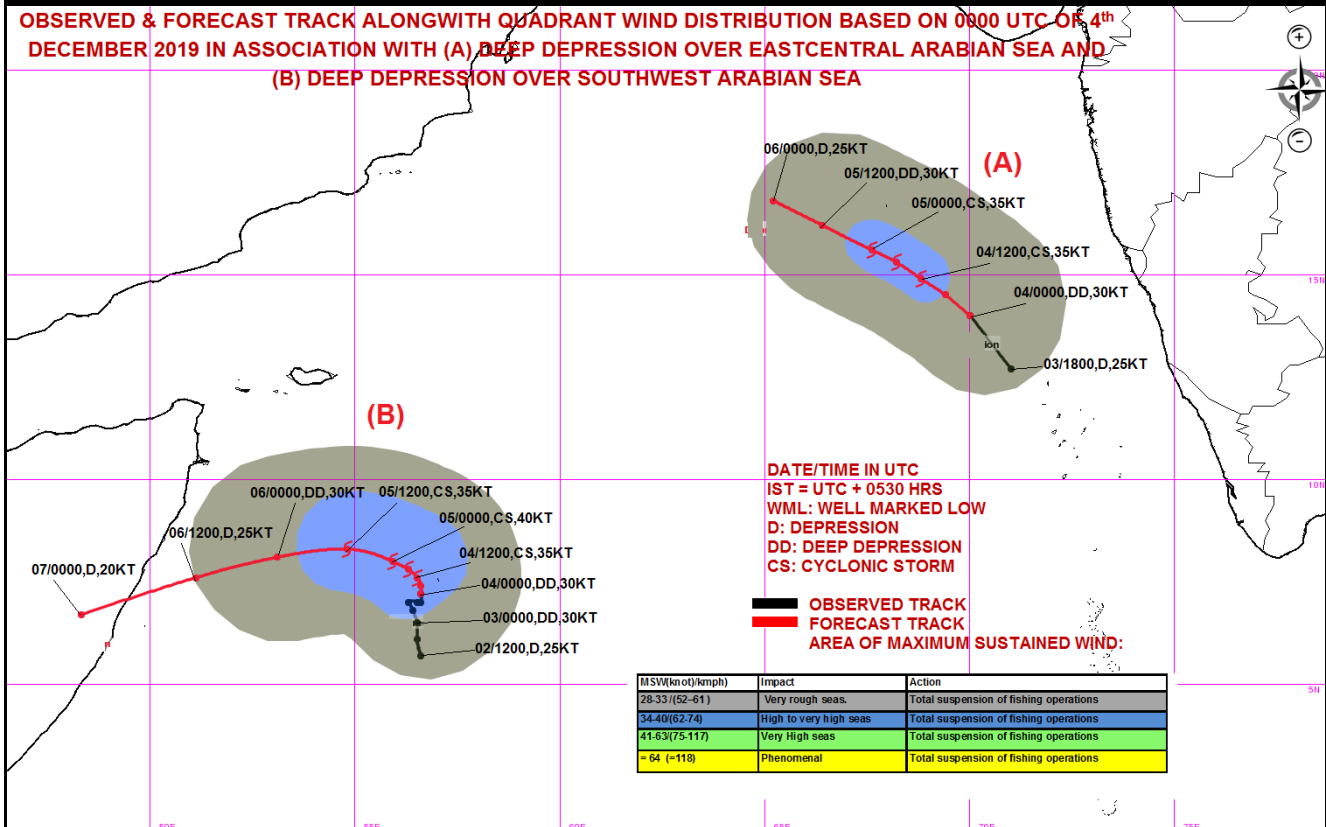
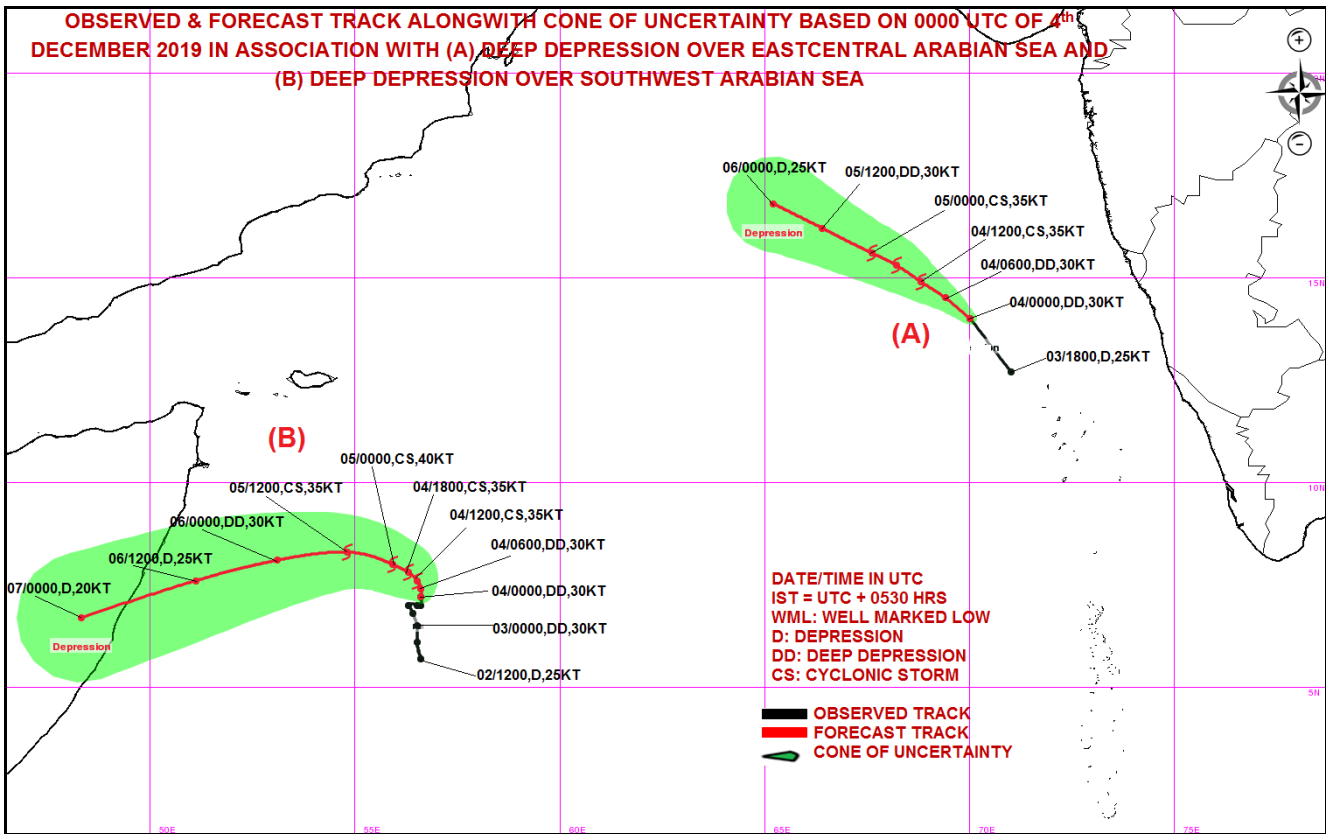
(V R DURAI)  
SCIENTIST-E, RSMC, NEW DELHI

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**





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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 04.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0630 UTC OF 04.12.2019 BASED ON 0300 UTC OF 04.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA**

**(B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

**(A) DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA:**

THE DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 32 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0300 UTC OF 04<sup>TH</sup> DECEMBER, 2019, OVER EASTCENTRAL ARABIAN SEA, NEAR LATITUDE 14.7°N AND LONGITUDE 69.5°E ABOUT 600 KM SOUTH-SOUTHWEST OF MUMBAI (43003), 470 KM WEST-SOUTHWEST OF PANJIM (43192). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS AWAY FROM INDIAN COAST DURING NEXT 48 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/0300	14.7/69.5	50-60 GUSTING TO 70	DEEP DEPRESSION
04.12.19/0600	15.0/69.2	50-60 GUSTING TO 70	DEEP DEPRESSION
04.12.19/1200	15.4/68.8	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/1800	15.8/68.2	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0000	16.1/67.6	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/1200	16.5/66.4	55-65 GUSTING TO 75	DEEP DEPRESSION
06.12.19/0000	16.8/65.2	40-50 GUSTING TO 60	DEPRESSION

**(B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA:**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA MOVED NORTHWARDS WITH A SPEED OF 06 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0300 UTC OF 04<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.4°N AND LONGITUDE 56.6°E OVER SOUTHWEST ARABIAN SEA, ABOUT 650 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 920 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME MORE TIME AND THEN RECURVE WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 03 DAYS.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/0300	7.4/56.6	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/0600	7.4/56.6	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/1200	7.6/56.5	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/1800	7.8/56.3	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0000	8.0/55.9	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/1200	8.3/54.8	65-75 GUSTING TO 85	CYCLONIC STORM
06.12.19/0000	8.1/53.1	60-70 GUSTING TO 80	DEEP DEPRESSION
06.12.19/1200	7.6/51.1	40-50 GUSTING TO 60	DEPRESSION
07.12.19/0000	6.7/48.3	30-40 GUSTING TO 50	DEPRESSION

**REMARKS:**

(A) AS PER THE SATELLITE IMAGERY OF 0300 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.0. ASSOCIATED BROKEN TO LOW/MED CLOUDS WITH EMBDD INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL ARABIAN SEA BETWEEN LAT 12.0N TO 17.0N & LONG 68.5E TO 72.0E (MINIMUM CTT MINUS 85 DEG CEL)

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY HAS DECREASED AND IS ABOUT  $100 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHEAST OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  TO SOUTHEAST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS 27-28°C AND ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 80-90 KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK. AS THE SYSTEM IS LYING IN A MODERATELY FAVOURABLE CONDITIONS, IT IS LIKELY TO FURTHER INTENSIFY INTO A MARGINAL CYCLONIC STORM BY 1200 UTC OF 04<sup>TH</sup> DECEMBER.

AS THE SYSTEM LIES IS BEING STEERED BY LOWER & MIDDLE TROPOSPHERIC WINDS IN THE EASTERLY REGIME, IT IS VERY LIKELY TO MOVE NORTHWESTWARDS AWAY FROM THE COAST DURING NEXT 48 HOURS.

(B). AS PER THE SATELLITE IMAGERY OF 0300 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 6.0°N TO 11.5°N AND LONG 55.0°E TO 60.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY HAS INCREASED AND IS ABOUT  $200 \times 10^{-5} \text{SEC}^{-1}$  AROUND THE SYSTEM AREA. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHEAST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  THE NORTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. TROPICAL CYCLONE HEAT POTENTIAL IS 100-110 KJ/CM2 OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENT, THE DEEP DEPRESSION IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 04 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

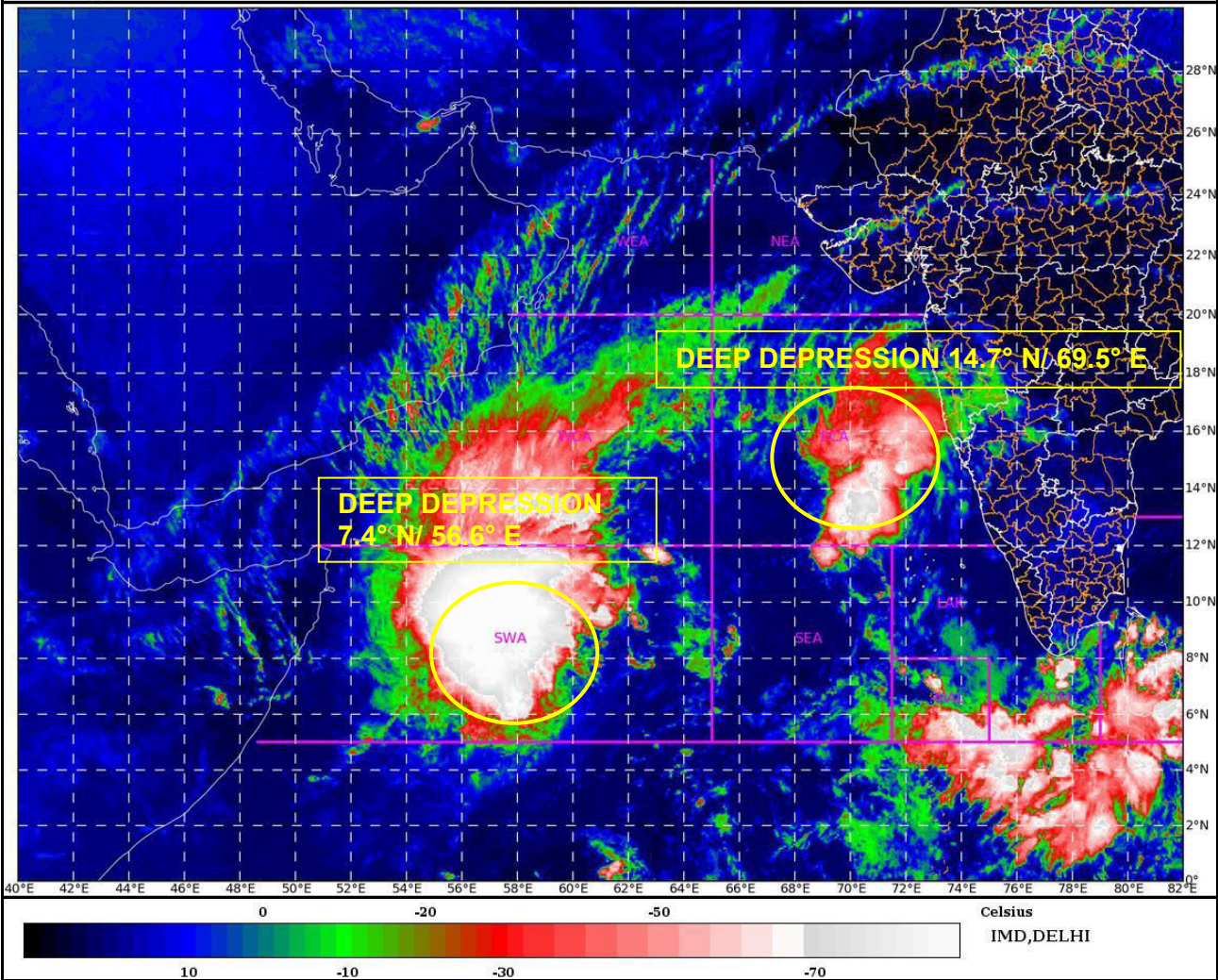
(SUNITHA DEVI S)  
SCIENTIST-E, RSMC, NEW DELHI

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN\_SEA

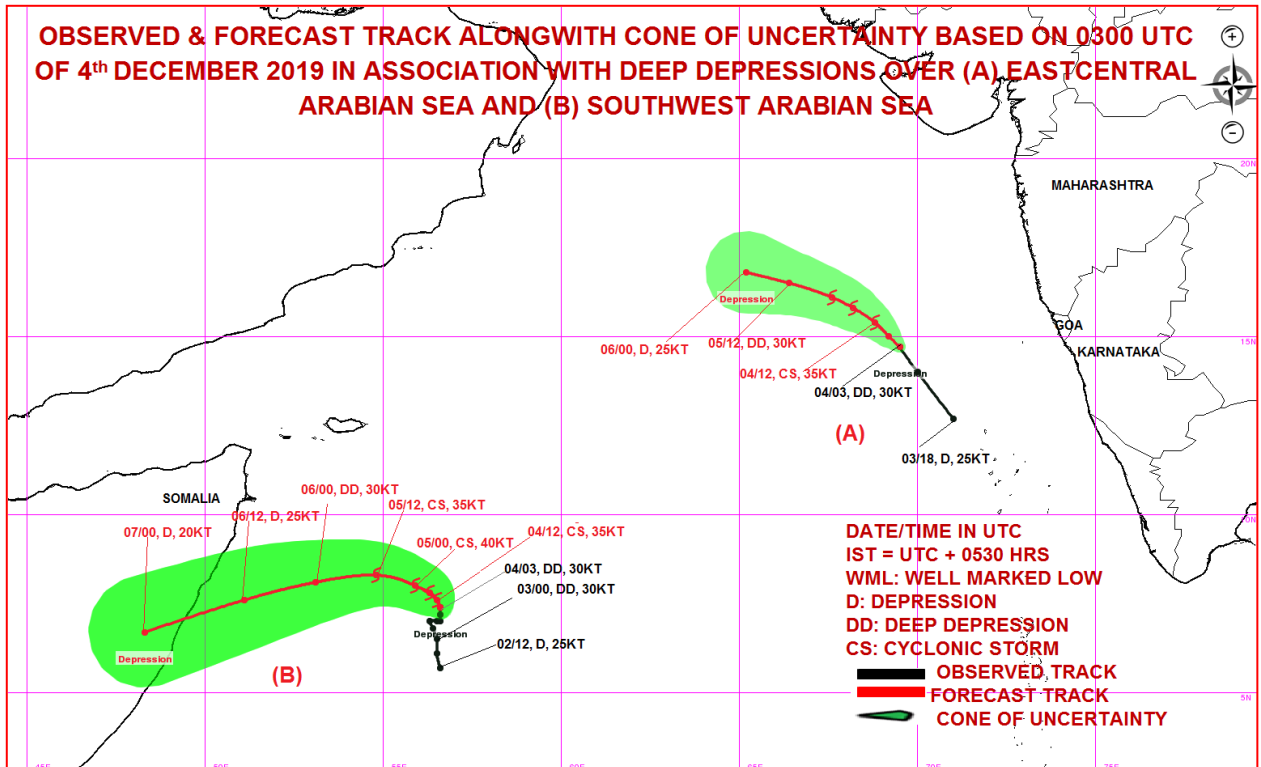
04-12-2019/(0500 to 0527) GMT  
04-12-2019/(1030 to 1057) IST



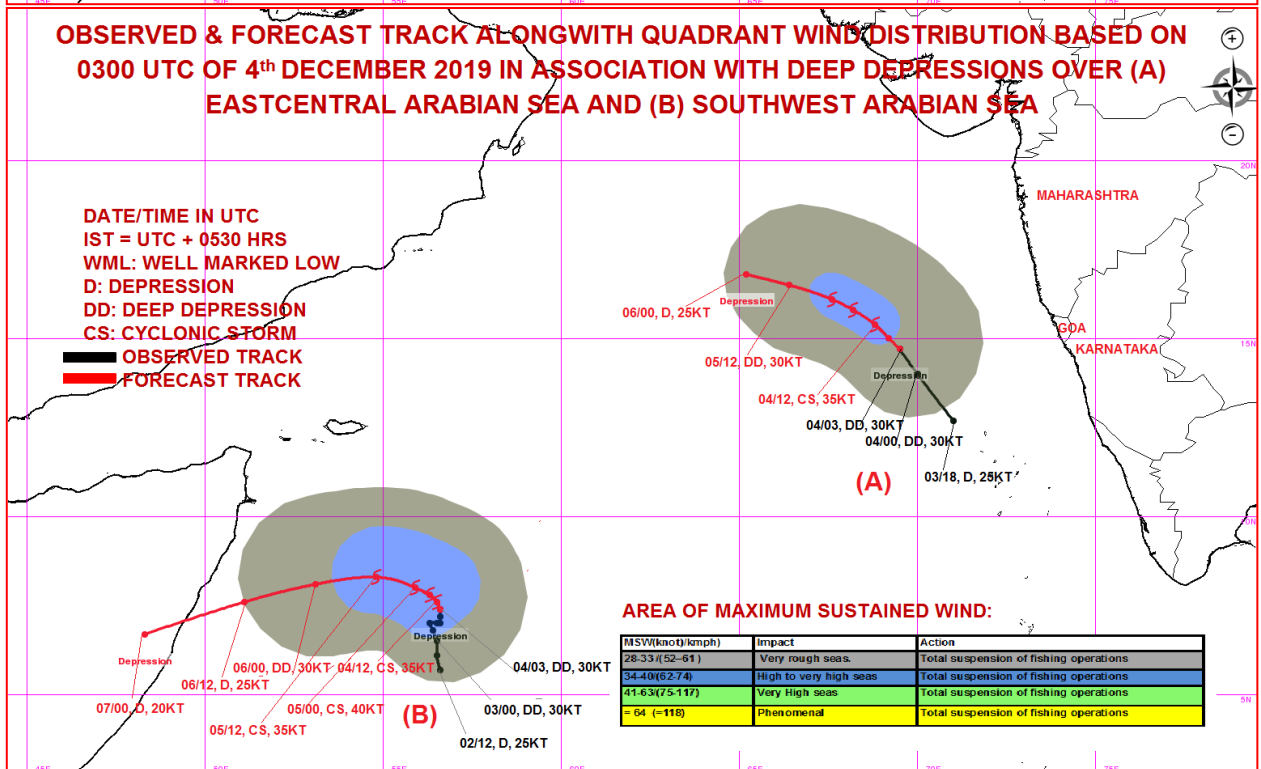
SWA: SOUTHWEST ARABIAN SEA

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%

**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY BASED ON 0300 UTC OF 4<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH DEEP DEPRESSIONS OVER (A) EASTCENTRAL ARABIAN SEA AND (B) SOUTHWEST ARABIAN SEA**



**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION BASED ON 0300 UTC OF 4<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH DEEP DEPRESSIONS OVER (A) EASTCENTRAL ARABIAN SEA AND (B) SOUTHWEST ARABIAN SEA**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 04.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0900 UTC OF 04.12.2019 BASED ON 0600 UTC OF 04.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA & (B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

**(A) DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA:**

THE DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 21 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0600 UTC OF TODAY, THE 04<sup>TH</sup> DECEMBER, 2019, OVER EASTCENTRAL ARABIAN SEA, NEAR LATITUDE 14.9°N AND LONGITUDE 69.3°E ABOUT 600 KM SOUTH-SOUTHWEST OF MUMBAI (43003) AND 490 KM OF WEST-SOUTHWEST OF PANJIM (43192). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS, AWAY FROM INDIAN COAST DURING NEXT 48 HOURS. FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/0600	14.9/69.3	50-60 GUSTING TO 70	DEEP DEPRESSION
04.12.19/1200	15.5/68.9	50-60 GUSTING TO 70	DEEP DEPRESSION
04.12.19/1800	16.0/68.3	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0000	16.3/67.7	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0600	16.5/67.1	55-65 GUSTING TO 75	DEEP DEPRESSION
05.12.19/1800	16.8/66.0	40-50 GUSTING TO 60	DEPRESSION
06.12.19/0600	17.1/64.7	30-40 GUSTING TO 50	DEPRESSION

**(B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA:**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA MOVED NORTHWARDS WITH A SPEED OF 04 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0600 UTC OF 04<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.4°N AND LONGITUDE 56.6°E OVER SOUTHWEST ARABIAN SEA, ABOUT 650 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 920 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 06 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME MORE TIME AND THEN RECURVE WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 03 DAYS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/0600	7.4/56.6	55-65 GUSTING TO 75	DEEP DEPRESSION
04.12.19/1200	7.7/56.3	60-70 GUSTING TO 80	CYCLONIC STORM
04.12.19/1800	8.0/56.0	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0000	8.2/55.7	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/0600	8.4/55.0	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/1800	8.5/53.8	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/0600	8.2/52.3	40-50 GUSTING TO 60	DEEP DEPRESSION
06.12.19/1800	7.6/50.4	35-45 GUSTING TO 55	DEPRESSION
07.12.19/0600	7.0/48.5	30-40 GUSTING TO 50	DEPRESSION

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

**REMARKS:**

(A) AS PER THE SATELLITE IMAGERY OF 0600 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.0. ASSOCIATED BROKEN TO LOW TO MEDIUM CLOUDS WITH EMBDDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL ARABIAN SEA BETWEEN LAT 12.0N TO 17.0N & LONG 68.5E TO 72.0E (MINIMUM CTT MINUS 76 DEG CEL)

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $100 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  TO SOUTHEAST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHEAST OF THE SYSTEM CENTER. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS 27-28°C AND DECREASES ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 80-90 KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK. AS THE SYSTEM IS LYING IN A MODERATELY FAVOURABLE CONDITIONS, IT IS LIKELY TO FURTHER INTENSIFY INTO A MARGINAL CYCLONIC STORM DURING NEXT 12 HOURS.

AS THE SYSTEM LIES IS BEING STEERED BY LOWER & MIDDLE TROPOSPHERIC WINDS IN THE EASTERLY REGIME, IT IS VERY LIKELY TO MOVE NORTHWESTWARDS AWAY FROM THE COAST DURING NEXT 48 HOURS.

(B). AS PER THE SATELLITE IMAGERY OF 0600 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT  $6.0^{\circ}$ N TO  $12.5^{\circ}$ N AND LONG  $54.0^{\circ}$ E TO  $60.0^{\circ}$ E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $200 \times 10^{-5} \text{SEC}^{-1}$  TO THE WEST OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHWEST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  THE NORTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT 26-28°C AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM2 OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENT TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA , THE DEEP DEPRESSION IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. AS THE SYSTEM LIES TO THE SOUTH OF UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER COAST FOR THE NEXT 03 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(SUNITHA DEVI S)  
SCIENTIST-E, RSMC, NEW DELHI

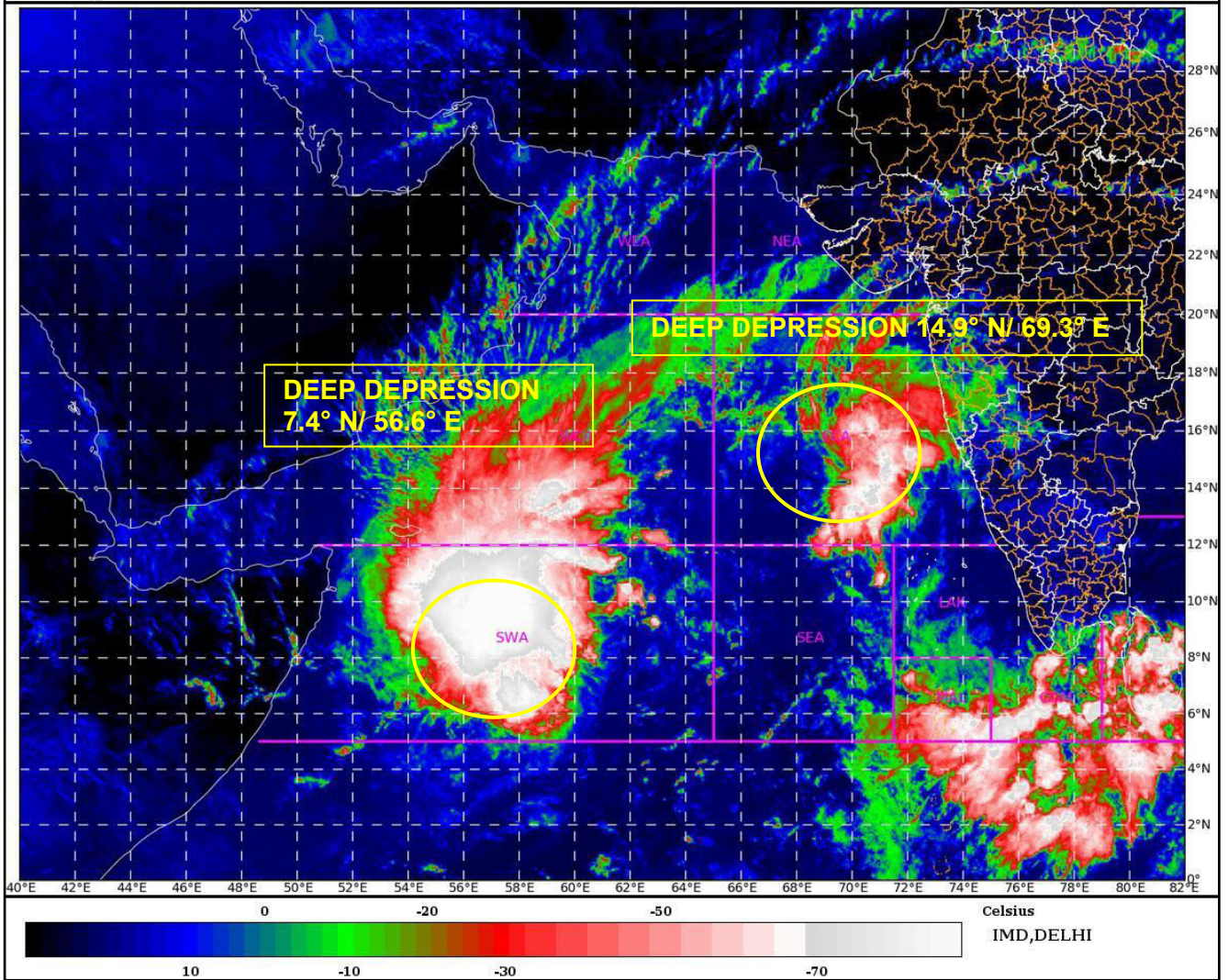
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**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

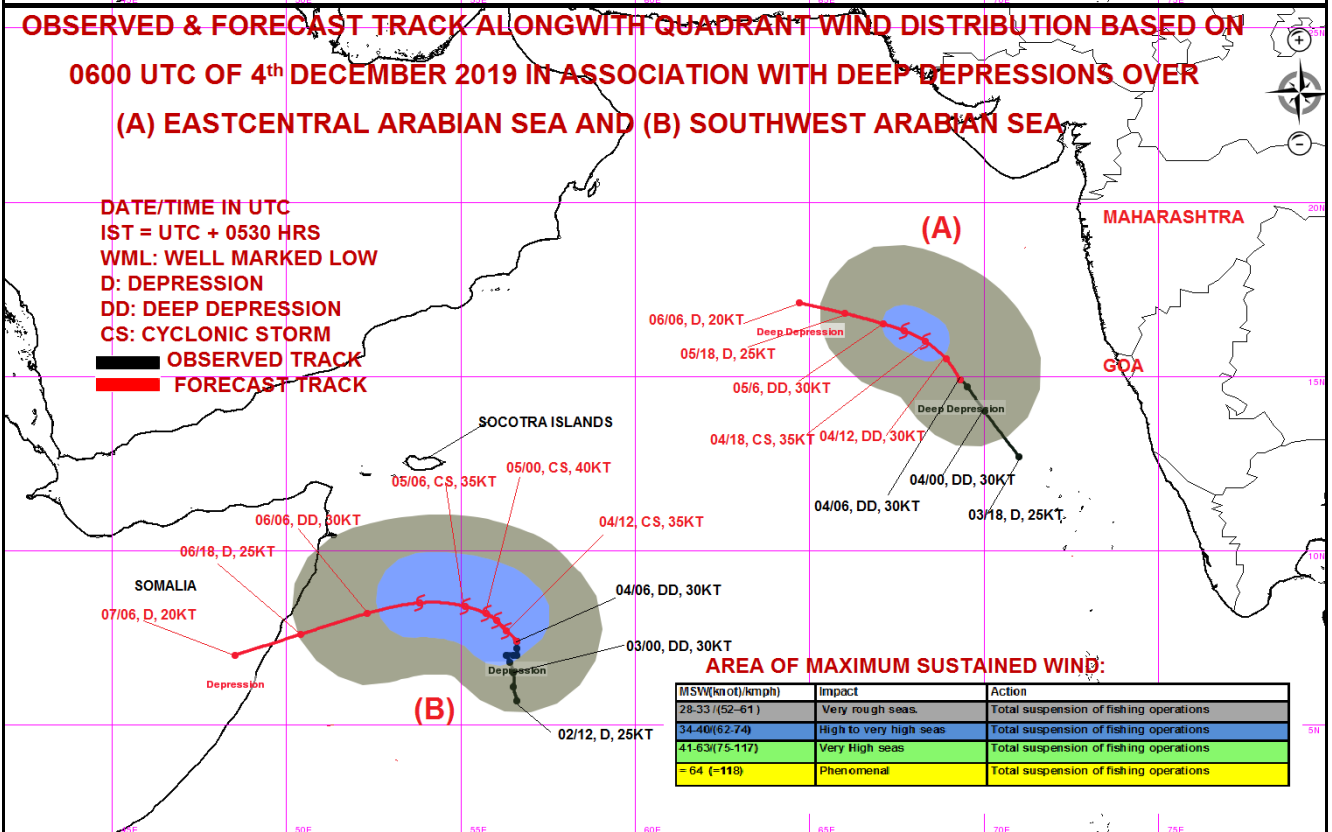
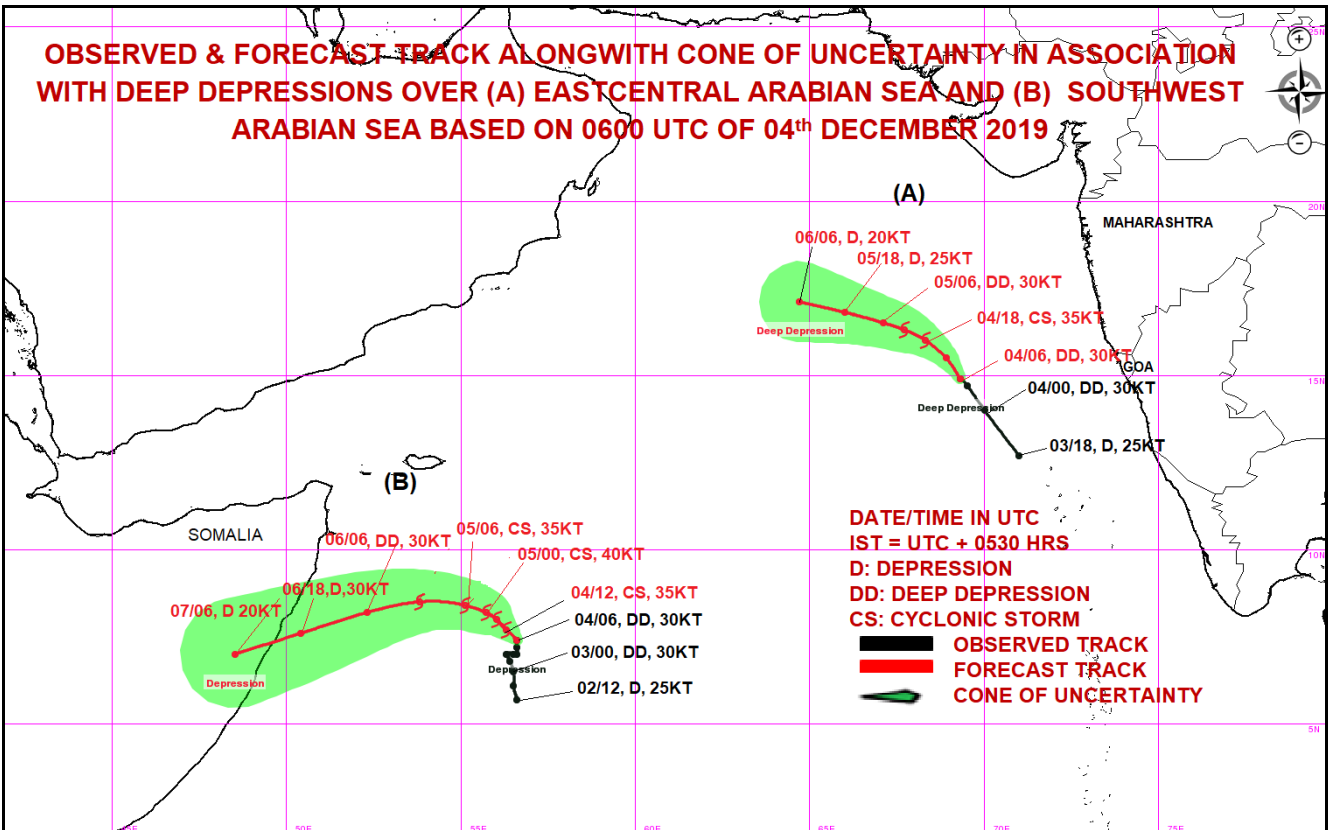
SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN\_SEA

04-12-2019/(0700 to 0727) GMT  
04-12-2019/(1230 to 1257) IST



SWA: SOUTHWEST ARABIAN SEA

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**





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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 04.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 04.12.2019 BASED ON 1200 UTC OF 04.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA & (B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

**(A) DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA:**

THE DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA MOVED WESTWARDS WITH A SPEED OF 16 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 1200 UTC OF TODAY, THE 04<sup>TH</sup> DECEMBER, 2019, OVER EASTCENTRAL ARABIAN SEA, NEAR LATITUDE 14.9°N AND LONGITUDE 68.4°E ABOUT 660 KM SOUTH-SOUTHWEST OF MUMBAI (43003) AND 580 KM OF WEST OF PANJIM (43192). IT IS VERY LIKELY RETAIN INTENSITY OF DEEP DEPRESSION FOR THE NEXT 36 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS, AWAY FROM INDIAN COAST DURING NEXT 48 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/1200	14.9/68.4	50-60 GUSTING TO 70	DEEP DEPRESSION
04.12.19/1800	15.2/67.9	50-60 GUSTING TO 70	DEEP DEPRESSION
05.12.19/0000	15.5/67.3	50-60 GUSTING TO 70	DEEP DEPRESSION
05.12.19/0600	15.8/66.7	50-60 GUSTING TO 70	DEEP DEPRESSION
05.12.19/1200	16.0/66.0	45-55 GUSTING TO 65	DEEP DEPRESSION
06.12.19/0000	16.3/64.6	40-50 GUSTING TO 60	DEPRESSION
06.12.19/1200	16.4/63.9	30-40 GUSTING TO 50	DEPRESSION

**(B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA:**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA REMAINED PRACTICALLY STATIONARY DURING PAST 06 HOURS AND LAY CENTRED AT 1200 UTC OF TODAY, THE 04<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.4°N AND LONGITUDE 56.6°E OVER SOUTHWEST ARABIAN SEA, ABOUT 650 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 920 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME MORE TIME AND THEN RECURVE WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 03 DAYS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/1200	7.4/56.6	50-60 GUSTING TO 70	DEEP DEPRESSION
04.12.19/1800	7.7/56.3	55-65 GUSTING TO 75	DEEP DEPRESSION
05.12.19/0000	7.9/56.0	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0600	8.1/55.3	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/1200	8.1/54.7	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/0000	8.0/53.3	50-60 GUSTING TO 70	DEEP DEPRESSION
06.12.19/1200	7.6/51.7	45-55 GUSTING TO 65	DEEP DEPRESSION
07.12.19/0000	7.0/49.7	40-50 GUSTING TO 60	DEPRESSION
07.12.19/1200	6.4/47.7	30-40 GUSTING TO 50	DEPRESSION

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

**REMARKS:**

(A) AS PER THE SATELLITE IMAGERY OF 1200 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.5/2.0. ASSOCIATED BROKEN TO LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL ARABIAN SEA BETWEEN LAT 11.5 N TO 17.0N & LONG 68.5E TO 72.0E . MINIMUM CTT IS MINUS 83 DEG CEL.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $100 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHEAST OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  TO SOUTHEAST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM AREA. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS 27-28°C AND DECREASES ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 80-90 KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK. AS THE SYSTEM IS LYING IN AN UNFAVOURABLE CONDITIONS WITYH INCREASING WIND SHEAR, THE POSSIBILITY OF ITS FURTHER INTENSIFICATION IS MINIMAL. MOST OF THE GLOBAL MODELA ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

(B) AS PER THE SATELLITE IMAGERY OF 1200 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT  $6.0^{\circ}$ N TO  $13.0^{\circ}$ N AND LONG  $54.0^{\circ}$ E TO  $61.0^{\circ}$ E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

AS THE SYSTEM LIES IS BEING STEERED BY LOWER & MIDDLE TROPOSPHERIC WINDS IN THE EASTERLY REGIME, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS AWAY FROM THE COAST DURING NEXT 48 HOURS.

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $200 \times 10^{-5} \text{SEC}^{-1}$  TO THE WEST OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $5 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT 26-28°C AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM2 OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, THE DEEP DEPRESSION IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. AS THE SYSTEM LIES TO THE SOUTH OF THE UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 03 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(SUNITHA DEVI S)  
SCIENTIST-E, RSMC, NEW DELHI

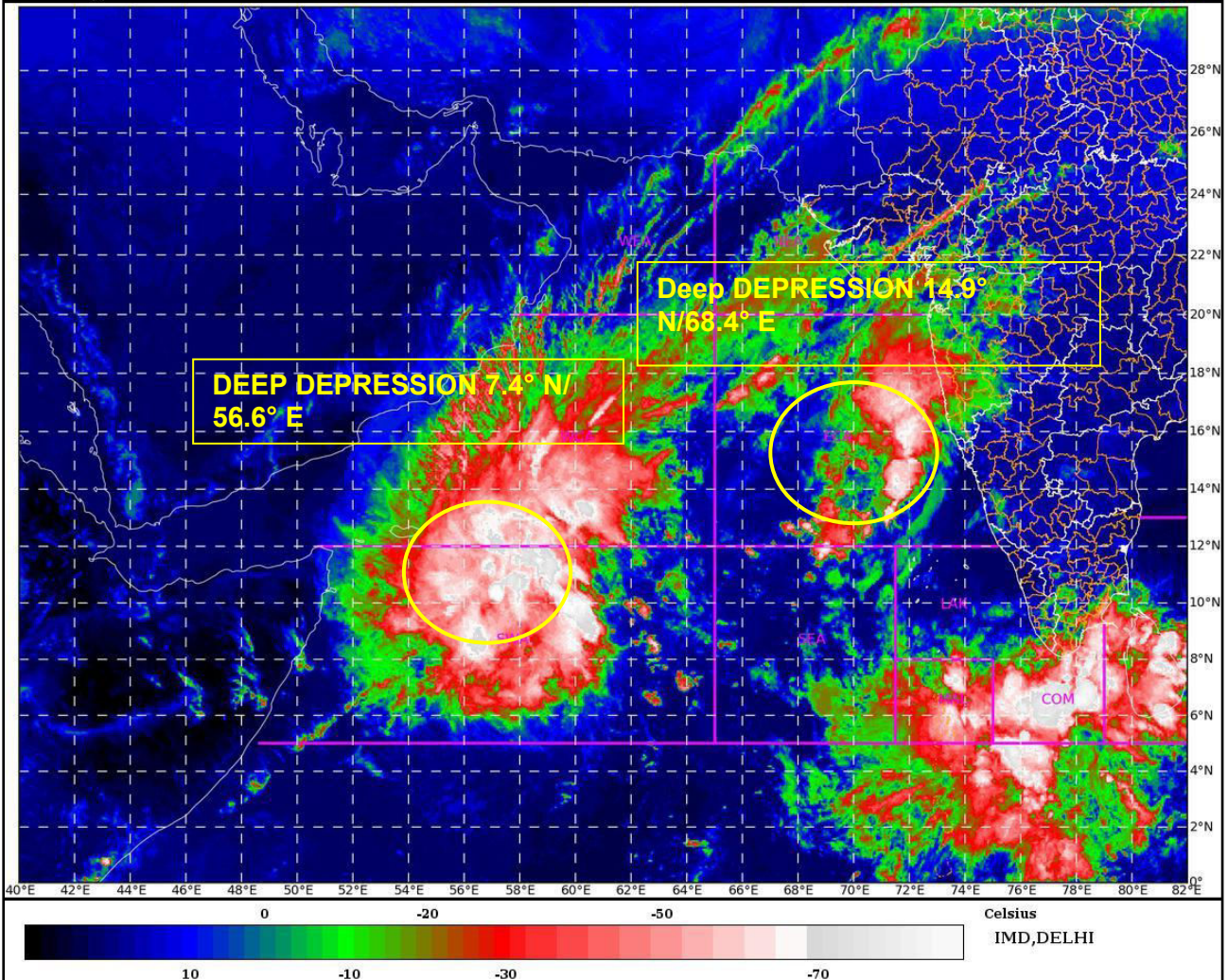
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**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**

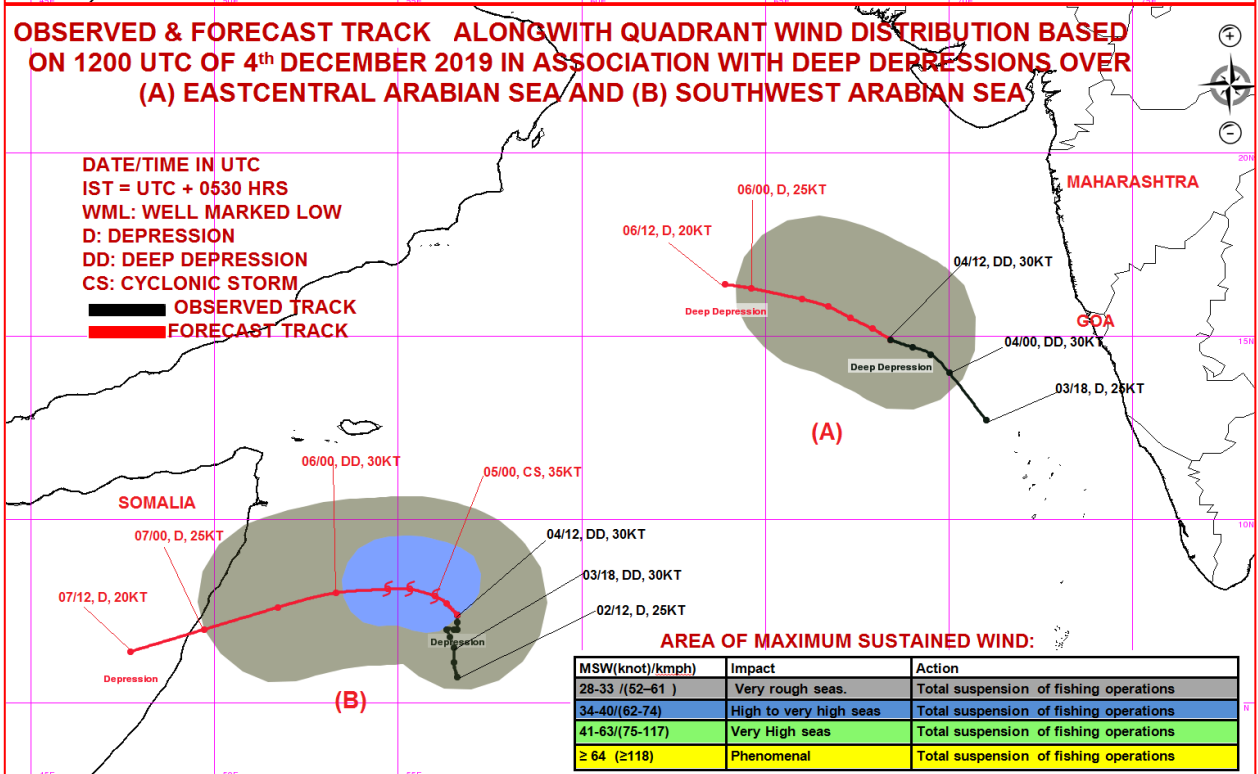
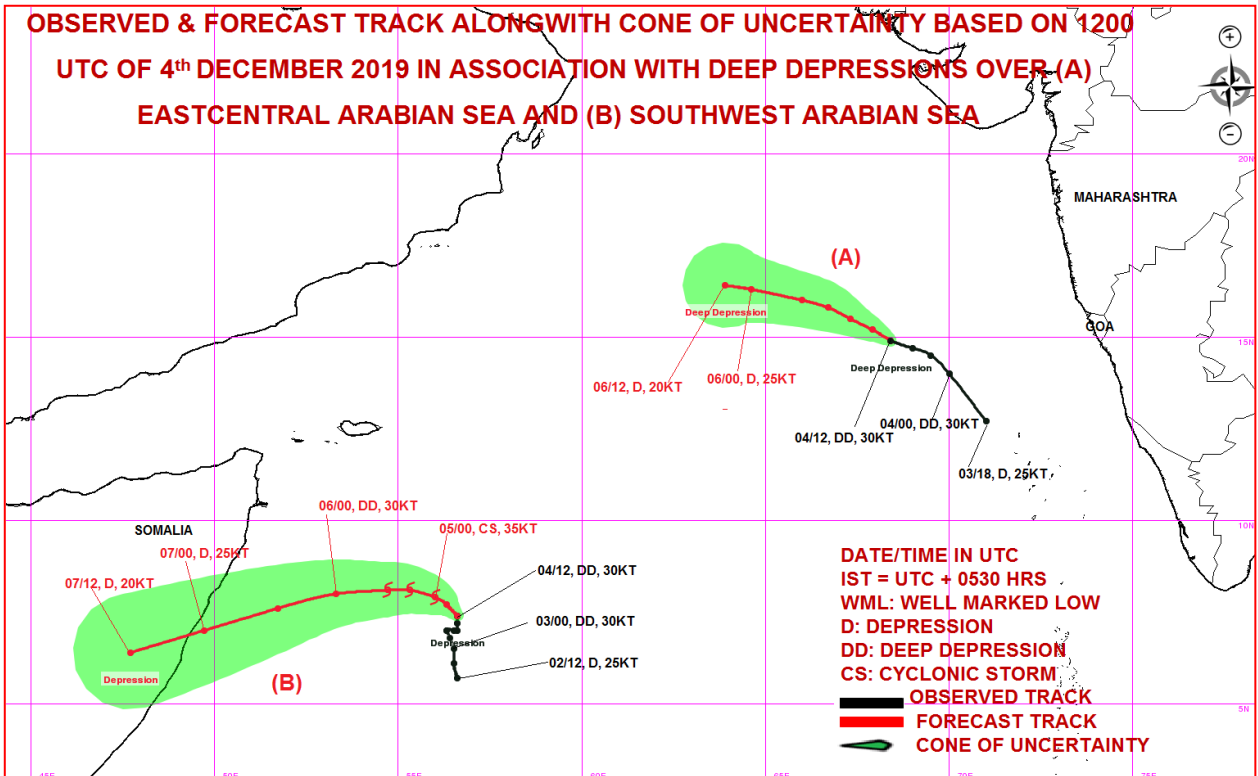
SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN SEA

04-12-2019/(1300 to 1326) GMT  
04-12-2019/(1830 to 1856) IST



SWA: SOUTHWEST ARABIAN SEA

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH: 76-100%**



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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 04.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2100 UTC OF 04.12.2019 BASED ON 1800 UTC OF 04.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA & (B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA**

**(A) DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA:**

THE DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF 07 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 1800 UTC OF 04<sup>TH</sup> DECEMBER, 2019, OVER EASTCENTRAL ARABIAN SEA, NEAR LATITUDE 15.0°N AND LONGITUDE 68.0°E ABOUT 690 KM WEST-SOUTHWEST OF MUMBAI (43003) AND 620 KM OF WEST OF PANJIM (43192). IT IS VERY LIKELY MAINTAIN INTENSITY OF DEEP DEPRESSION FOR THE NEXT 12 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS, AWAY FROM INDIAN COAST DURING NEXT 24 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/1800	15.0/68.0	50-60 GUSTING TO 70	DEEP DEPRESSION
05.12.19/0000	15.2/67.4	50-60 GUSTING TO 70	DEEP DEPRESSION
05.12.19/0600	15.5/66.7	45-55 GUSTING TO 65	DEPRESSION
05.12.19/1200	15.8/66.0	40-50 GUSTING TO 60	DEPRESSION
05.12.19/1800	16.1/65.3	30-40 GUSTING TO 50	WELL MARKED LOW

**(B) DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA:**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA MOVED NEARLY NORTHWARDS WITH A SPEED OF 20 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 1800 UTC OF 04<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 8.5°N AND LONGITUDE 56.7°E OVER SOUTHWEST ARABIAN SEA, ABOUT 550 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 880 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME MORE TIME AND THEN RECURVE WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST DURING NEXT 03 DAYS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
04.12.19/1800	8.5/56.7	55-65 GUSTING TO 75	DEEP DEPRESSION
05.12.19/0000	9.0/56.4	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/0600	9.2/55.9	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/1200	9.1/55.1	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/1800	8.8/54.0	50-60 GUSTING TO 70	DEEP DEPRESSION
06.12.19/0600	8.2/52.6	45-55 GUSTING TO 65	DEPRESSION
06.12.19/1800	7.3/50.4	40-50 GUSTING TO 60	DEPRESSION
07.12.19/0600	6.4/48.2	30-40 GUSTING TO 50	WELL MARKED LOW

**REMARKS:**

(A) AS PER THE SATELLITE IMAGERY OF 1800 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.5. ASSOCIATED BROKEN TO LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL ARABIAN SEA BETWEEN LAT 11.5 N TO 16.0N & LONG 68.0E TO 72.0E . MINIMUM CTT IS MINUS 83 DEG CEL.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

**: 76-100**

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $100 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHEAST OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  TO SOUTHEAST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM AREA. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS  $27-28^{\circ}\text{C}$  AND DECREASES ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS  $80-90 \text{ KJ/CM}^2$  OVER THE SYSTEM AREA AND DECREASES TO LESS THAN  $50 \text{ KJ/CM}^2$  ALONG THE FORECAST TRACK. AS THE SYSTEM IS LYING IN AN UNFAVOURABLE CONDITIONS WITYH INCREASING WIND SHEAR, THE POSSIBILITY OF ITS FURTHER INTENSIFICATION IS MINIMAL. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

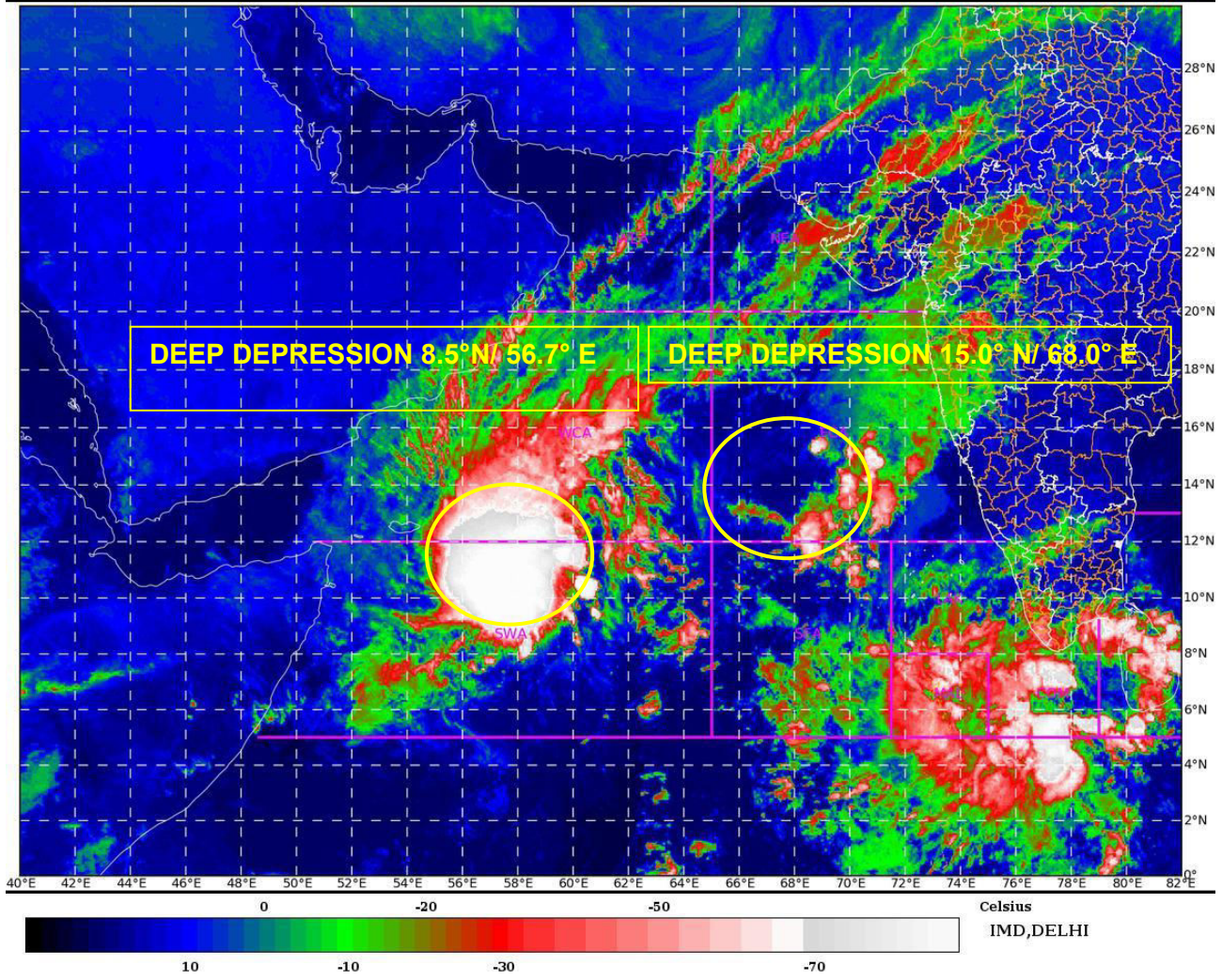
(B) AS PER THE SATELLITE IMAGERY OF 1800 UTC ON 04<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T 2.0. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT  $8.5^{\circ}\text{N}$  TO  $16.5^{\circ}\text{N}$  AND LONG  $54.5^{\circ}\text{E}$  TO  $61.0^{\circ}\text{E}$ . MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

AS THE SYSTEM LIES IS BEING STEERED BY LOWER & MIDDLE TROPOSPHERIC WINDS IN THE EASTERLY REGIME, INITIALLY IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS BEFORE IT RECURVES WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST.

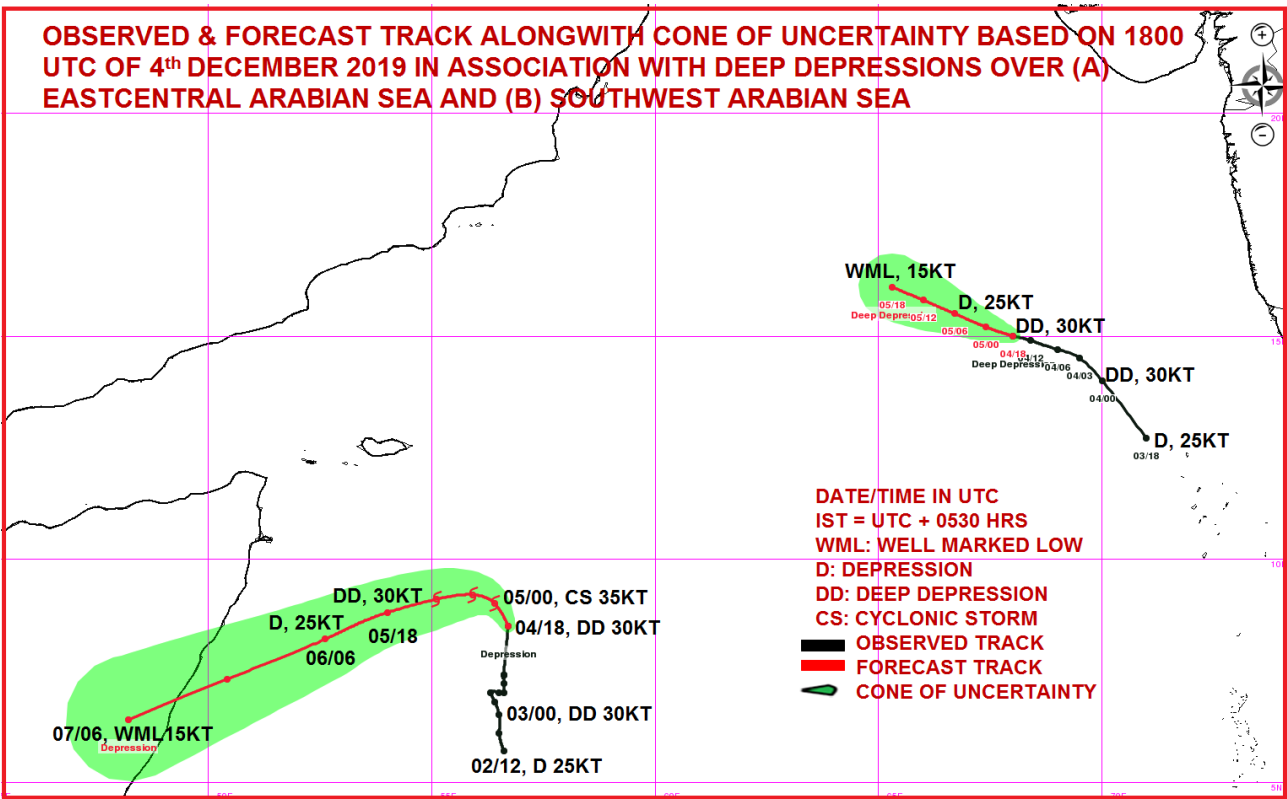
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $200 \times 10^{-5} \text{SEC}^{-1}$  TO THE WEST OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $5 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-28^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS  $30-40 \text{ KJ/CM}^2$  OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, THE DEEP DEPRESSION IS VERY LIKELY TO INTENSIFY INTO A CYCLONIC STORM DURING NEXT 12 HOURS. AS THE SYSTEM LIES TO THE SOUTH OF THE UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 03 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(ANANDA KUMAR DAS)  
SCIENTIST-E, RSMC, NEW DELHI



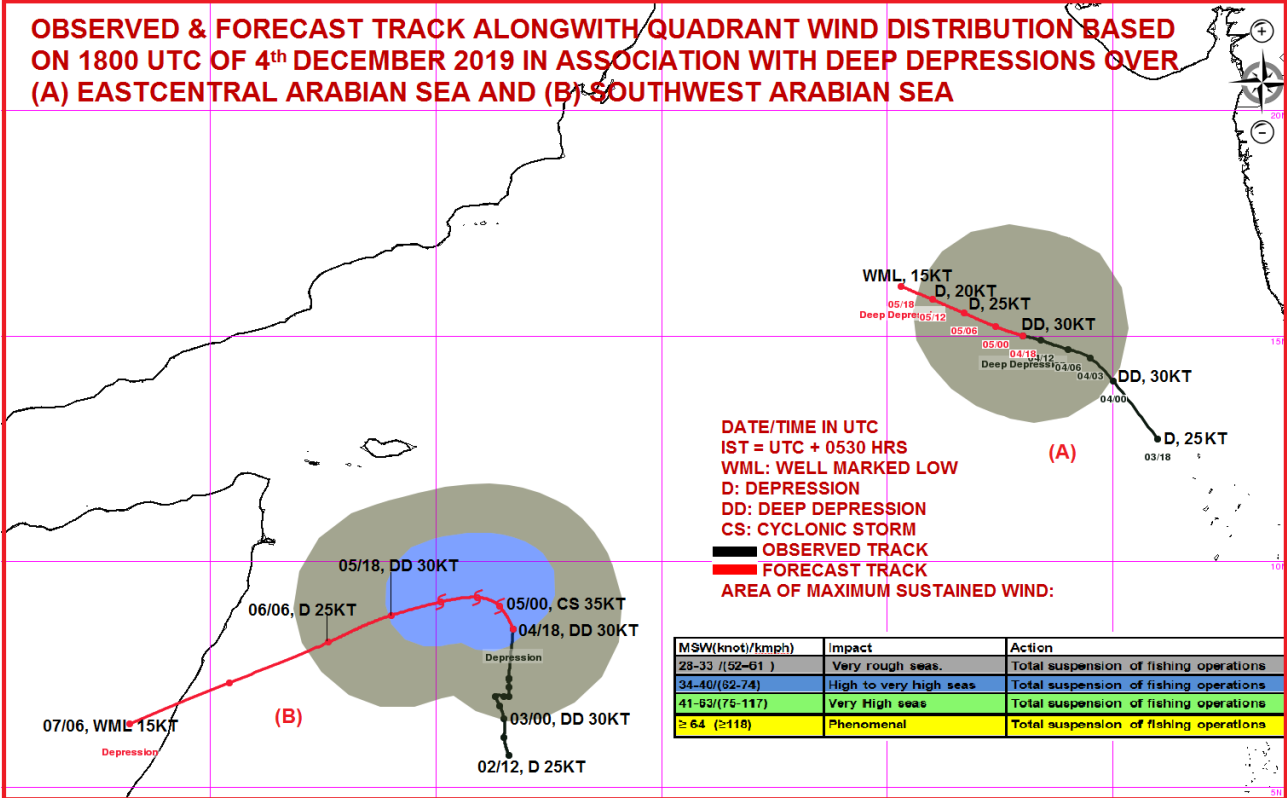
SWA: SOUTHWEST ARABIAN SEA

**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY BASED ON 1800 UTC OF 4<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH DEEP DEPRESSIONS OVER (A) EASTCENTRAL ARABIAN SEA AND (B) SOUTHWEST ARABIAN SEA**



DATE/TIME IN UTC  
 IST = UTC + 0530 HRS  
 WML: WELL MARKED LOW  
 D: DEPRESSION  
 DD: DEEP DEPRESSION  
 CS: CYCLONIC STORM  
 — OBSERVED TRACK  
 — FORECAST TRACK  
 — CONE OF UNCERTAINTY

**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION BASED ON 1800 UTC OF 4<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH DEEP DEPRESSIONS OVER (A) EASTCENTRAL ARABIAN SEA AND (B) SOUTHWEST ARABIAN SEA**



DATE/TIME IN UTC  
 IST = UTC + 0530 HRS  
 WML: WELL MARKED LOW  
 D: DEPRESSION  
 DD: DEEP DEPRESSION  
 CS: CYCLONIC STORM  
 — OBSERVED TRACK  
 — FORECAST TRACK  
 AREA OF MAXIMUM SUSTAINED WIND:

MSW(knot/kmph)	Impact	Action
23-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations
41-53 (75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

: 76-100  
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.1**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 05.12.2019**

**TO: 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.1 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0330 UTC OF 05.12.2019 BASED ON 0000 UTC OF 05.12.2019.**

**SUB: (A) CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA & (B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA**

**(A) CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA:**

THE DEEP DEPRESSION OVER SOUTHWEST ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 14 KMPH DURING PAST 06 HOURS, INTENSIFIED INTO CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN'), AND LAY CENTRED AT 0000 UTC OF 05TH DECEMBER, 2019 NEAR LATITUDE 9.2°N AND LONGITUDE 56.4°E OVER SOUTHWEST ARABIAN SEA, ABOUT 470 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 820 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM TILL 0000 UTC OF 6<sup>TH</sup> DECEMBER AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE NORTH-NORTHWESTWARDS FOR SOME MORE TIME, THEN RE-CURVE WEST-SOUTHWESTWARDS AND CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 7° & 8°N DURING 0000 UTC OF 07TH DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.12.19/0000	9.2/56.4	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/0600	9.3/55.9	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/1200	9.1/55.1	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/1800	8.8/54.2	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/0000	8.5/53.3	50-60 GUSTING TO 70	DEEP DEPRESSION
06.12.19/1200	7.7/51.3	45-55 GUSTING TO 65	DEPRESSION
07.12.19/0000	7.0/49.5	40-50 GUSTING TO 60	DEPRESSION
07.12.19/1200	6.3/47.7	30-40 GUSTING TO 50	WELL MARKED LOW

**(B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA:**

THE DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA MOVED SLOWLY NORTHWESTWARDS WITH A SPEED OF 2 KMPH DURING PAST 06 HOURS, WEAKENED INTO A DEPRESSION AND LAY CENTRED AT 0000 UTC OF 05TH DECEMBER, 2019, OVER EASTCENTRAL ARABIAN SEA, NEAR LATITUDE 15.1°N AND LONGITUDE 67.9°E ABOUT 690 KM WEST-SOUTHWEST OF MUMBAI (43003) AND 630 KM OF WEST OF PANJIM (43192). IT IS VERY LIKELY TO WEAKEN GRADUALLY INTO A WELL MARKED LOW PRESSURE AREA AND MOVE WEST-NORTHWESTWARDS AWAY FROM INDIAN COAST DURING NEXT 12 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.12.19/0000	15.1/67.9	45-55 GUSTING TO 65	DEPRESSION
05.12.19/0600	15.3/67.2	40-50 GUSTING TO 60	DEPRESSION
05.12.19/1200	15.6/66.5	35-45 GUSTING TO 55	DEPRESSION
05.12.19/1800	15.9/65.8	30-40 GUSTING TO 50	WELL MARKED LOW

**: 76-100**

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

**REMARKS:**

(A) AS PER THE SATELLITE IMAGERY OF 0000 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 6.0<sup>0</sup>N TO 16.5<sup>0</sup>N AND LONG 54.5<sup>0</sup>E TO 61.5<sup>0</sup>E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

AS THE SYSTEM LIES IS BEING STEERED BY LOWER & MIDDLE TROPOSPHERIC WINDS IN THE EASTERLY REGIME, INITIALLY IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS BEFORE IT RECURVES WEST-SOUTHWESTWARDS TOWARDS SOMALIA COAST.

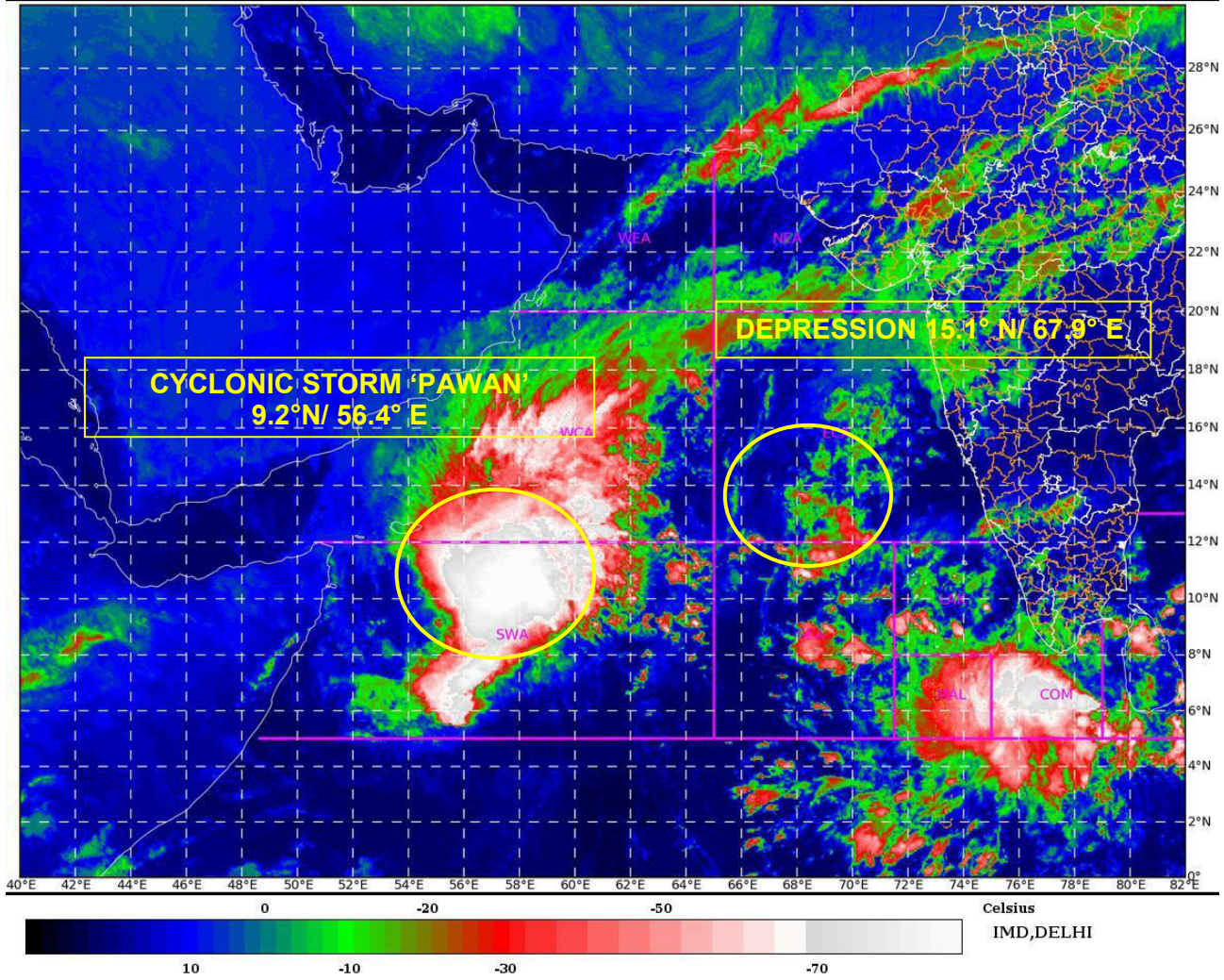
THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE WEST OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM AREA AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. SEA SURFACE TEMPERATURE IS ABOUT 26-27°C AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM2 OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, AS THE SYSTEM LIES TO THE SOUTH OF THE UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS TOWARDS SOMALIA COAST FOR THE NEXT 02 DAYS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(B) AS PER THE SATELLITE IMAGERY OF 0000 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.0/1.5. ASSOCIATED BROKEN TO LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL ARABIAN SEA BETWEEN LAT 10.5 N TO 14.0N & LONG 68.0E TO 71.0E . MINIMUM CTT IS MINUS 58 DEG CEL.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE.

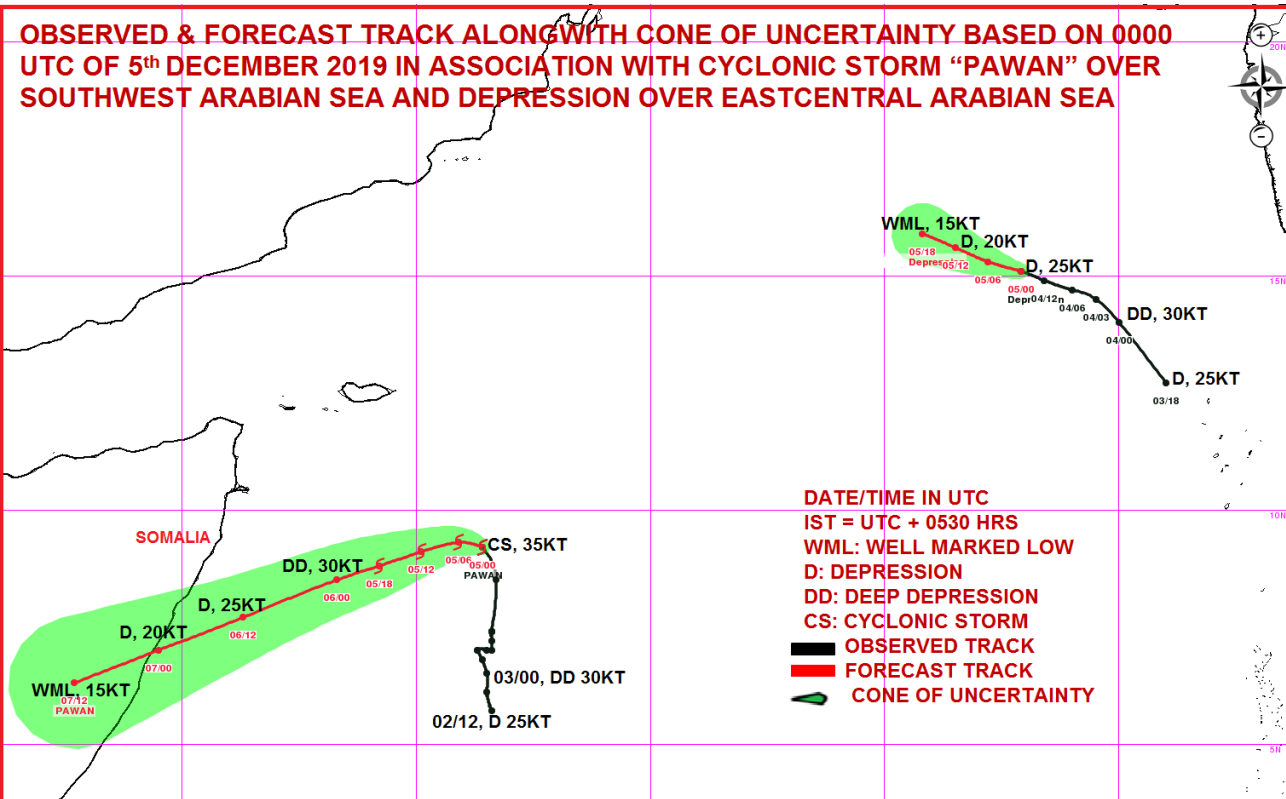
THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $50 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHEAST OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  TO SOUTHEAST OF THE SYSTEM CENTER. THE UPPER LEVEL DIVERGENCE IS ABOUT  $5 \times 10^{-5} \text{S}^{-1}$  SOUTHEAST OF THE SYSTEM AREA. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-25 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. SEA SURFACE TEMPERATURE OVER THE SYTEM AREA IS 28-29°C AND DECREASES ALONG THE FORECAST TRACK. TROPICAL CYCLONE HEAT POTENTIAL IS 80-90 KJ/CM2 OVER THE SYSTEM AREA AND DECREASES TO LESS THAN 50 KJ/CM2 ALONG THE FORECAST TRACK. AS THE SYSTEM IS LYING IN AN UNFAVOURABLE CONDITIONS WITH INCREASING WIND SHEAR, THERE IS A POSSIBILITY OF ITS FURTHER WEAKENING. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

**(ANANDA KUMAR DAS)**  
**SCIENTIST-E, RSMC, NEW DELHI**



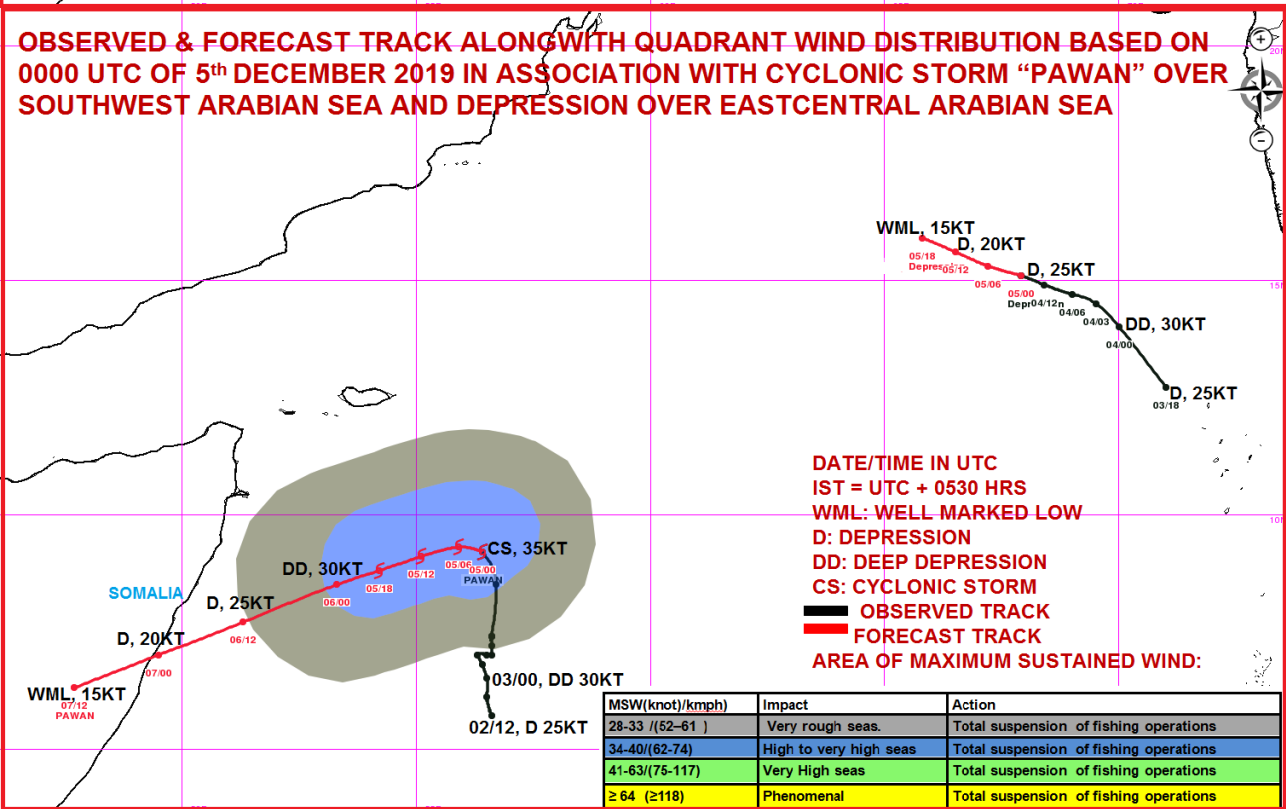
SWA: SOUTHWEST ARABIAN SEA

**OBSERVED & FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY BASED ON 0000 UTC OF 5<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA AND DEPRESSION OVER EASTCENTRAL ARABIAN SEA**



DATE/TIME IN UTC  
 IST = UTC + 0530 HRS  
 WML: WELL MARKED LOW  
 D: DEPRESSION  
 DD: DEEP DEPRESSION  
 CS: CYCLONIC STORM  
 — OBSERVED TRACK  
 — FORECAST TRACK  
 — CONE OF UNCERTAINTY

**OBSERVED & FORECAST TRACK ALONG WITH QUADRANT WIND DISTRIBUTION BASED ON 0000 UTC OF 5<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA AND DEPRESSION OVER EASTCENTRAL ARABIAN SEA**



DATE/TIME IN UTC  
 IST = UTC + 0530 HRS  
 WML: WELL MARKED LOW  
 D: DEPRESSION  
 DD: DEEP DEPRESSION  
 CS: CYCLONIC STORM  
 — OBSERVED TRACK  
 — FORECAST TRACK  
 — AREA OF MAXIMUM SUSTAINED WIND:

MSW(knot)/kmph)	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40(62-74)	High to very high seas	Total suspension of fishing operations
41-63/(75-117)	Very High seas	Total suspension of fishing operations
≥ 64 (≥118)	Phenomenal	Total suspension of fishing operations

: 76-100  
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.2**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 05.12.2019**

**TO: 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.2 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0630 UTC OF 05.12.2019 BASED ON 0300 UTC OF 05.12.2019.**

**SUB: (A) CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA & (B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA**

**(A) CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA:**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 07 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0300 UTC OF 05<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 09.2°N AND LONGITUDE 56.4°E OVER SOUTHWEST ARABIAN SEA, ABOUT 470 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 820 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 12 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE NORTHWESTWARDS FOR SOME MORE TIME, THEN RE-CURVE WEST-SOUTHWESTWARDS AND CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 07° & 08°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.12.19/0300	9.2/56.4	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/0600	9.3/56.0	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/1200	9.1/55.1	60-70 GUSTING TO 80	CYCLONIC STORM
05.12.19/1800	8.8/54.2	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/0000	8.5/53.3	50-60 GUSTING TO 70	DEEP DEPRESSION
06.12.19/1200	7.7/51.3	45-55 GUSTING TO 65	DEPRESSION
07.12.19/0000	7.0/49.5	30-40 GUSTING TO 50	DEPRESSION
07.12.19/1200	6.3/47.7	20-30 GUSTING TO 40	WELL MARKED LOW

**(B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA:**

THE DEPRESSION OVER EASTCENTRAL ARABIAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF 08 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0300 UTC OF 05<sup>TH</sup> DECEMBER, 2019, OVER EASTCENTRAL ARABIAN SEA, NEAR LATITUDE 15.2°N AND LONGITUDE 67.5°E ABOUT 710 KM WEST-SOUTHWEST OF MUMBAI (43003) AND 680 KM OF WEST OF PANJIM (43192). IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS AND WEAKEN GRADUALLY INTO A WELL MARKED LOW PRESSURE AREA DURING NEXT 12 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.12.19/0300	15.2/67.5	40-50 GUSTING TO 60	DEPRESSION
05.12.19/0600	15.3/67.2	35-45 GUSTING TO 55	DEPRESSION
05.12.19/1200	15.6/66.5	25-35 GUSTING TO 45	WELL MARKED LOW

**: 76-100**

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

**REMARKS:**

(A) AS PER THE SATELLITE IMAGERY OF 0300 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 5.5<sup>0</sup>N TO 16.5<sup>0</sup>N AND LONG 54.0<sup>0</sup>E TO 62.0<sup>0</sup>E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. SEA SURFACE TEMPERATURE IS ABOUT 26-27°C AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM<sup>2</sup> OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN GRADUALLY BEFORE CROSSING SOMALIA COAST AS THE SYSTEM WILL ENCOUNTER DRY AIR INCURSION AND ALSO DUE TO LOW TCHP VALUES.

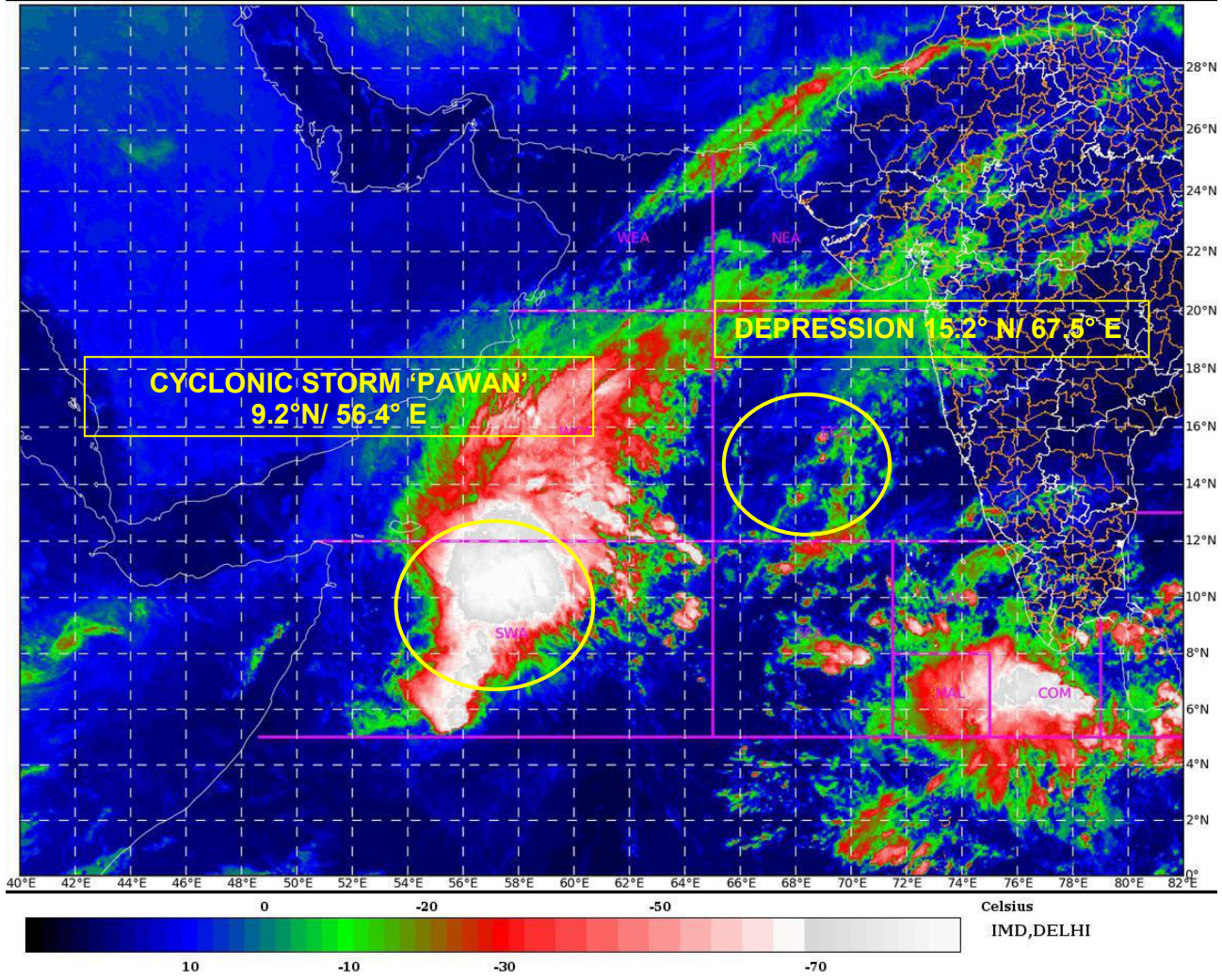
AS THE SYSTEM LIES TO THE SOUTH OF THE UPPER TROPOSPHERIC RIDGE AND IS BEING STEERED BY MIDDLE AND UPPER TROPOSPHERIC WINDS, IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS FOR SOME MORE TIME. THEN THE SYTEM WILL BE GUIDED BY THE MID LEVEL EASTERLIES CASUING THE SYSTEM TO MOVE WESTWARDS FOR SOME TIME. THEARE AFTER, THE SYSTEM WILL BE GUIDED BY THE ANTICYCLONE SITTING OVER SOMALIA AND IT WILL BE PUSHED SOUTHWESTWARDS. IT WILL CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 07° & 08°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(B) AS PER THE SATELLITE IMAGERY OF 0300 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.0/1.5. ASSOCIATED BROKEN TO LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL ARABIAN SEA BETWEEN LAT 10.5 N TO 15.0N & LONG 67.5E TO 71.0E . MINIMUM CTT IS MINUS 65 DEG CEL.

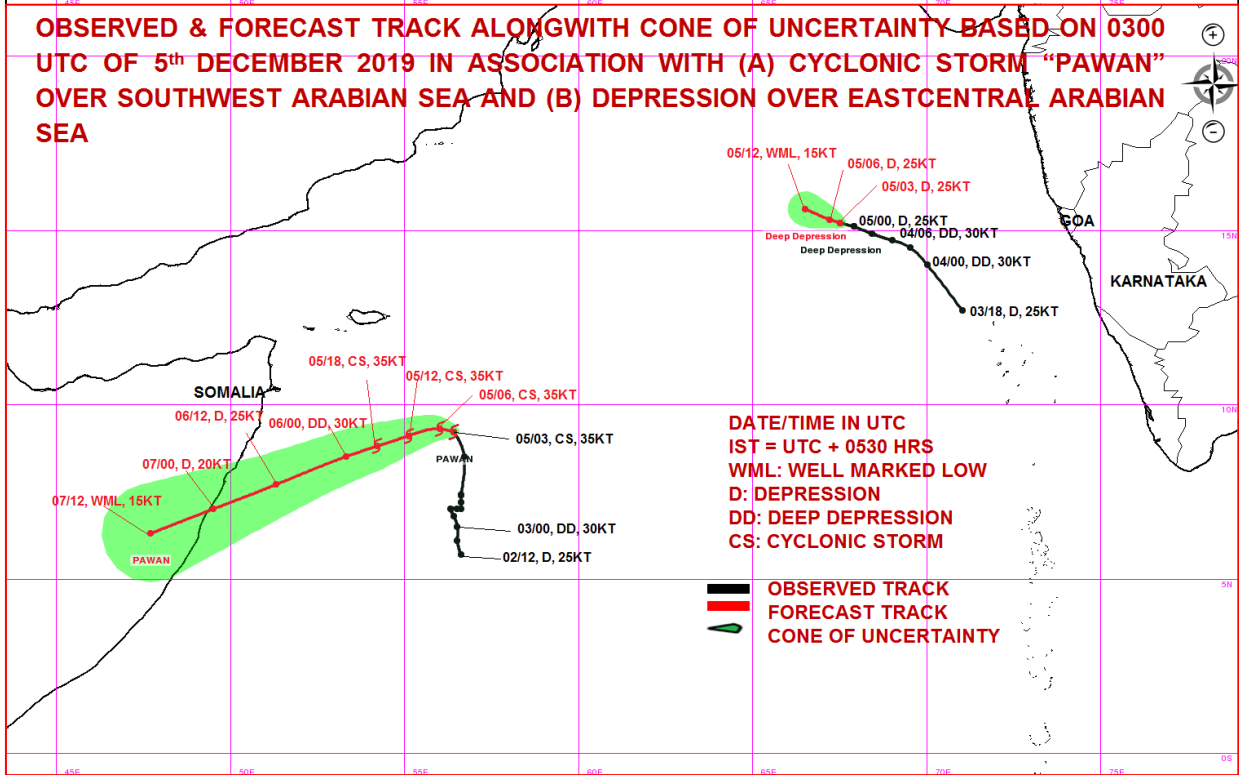
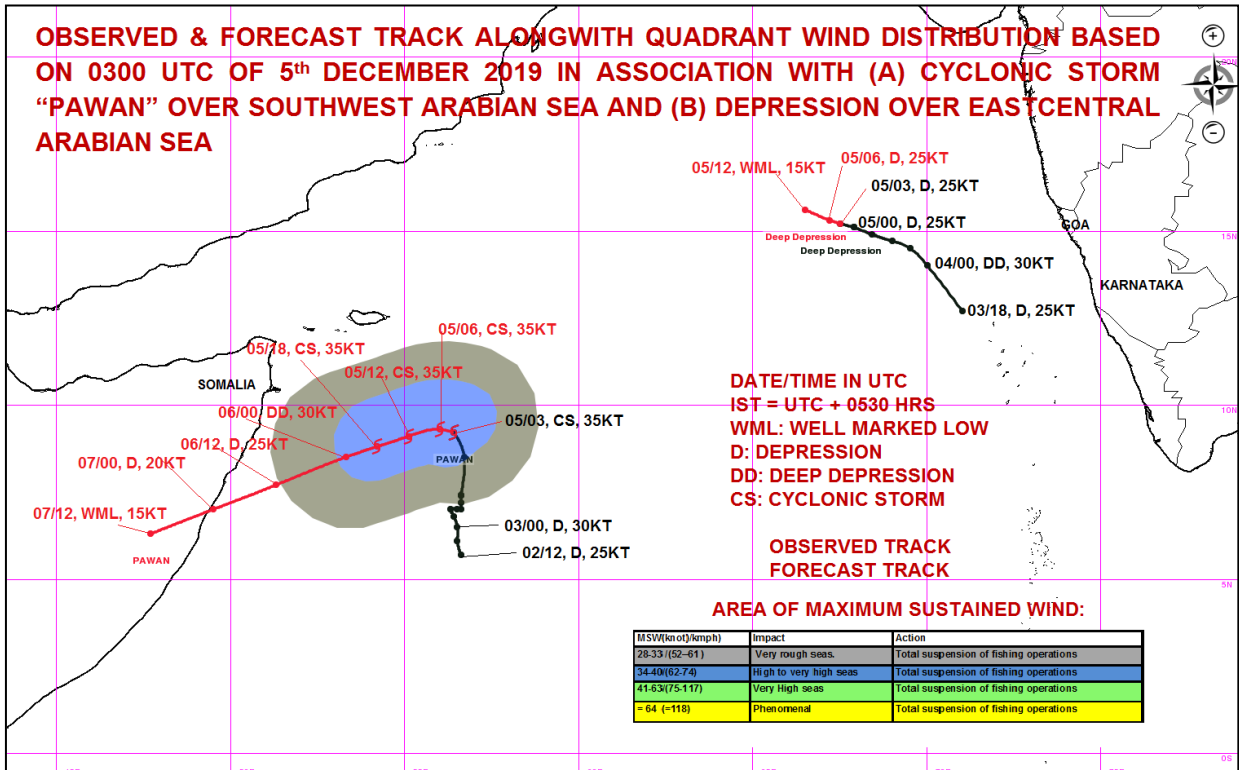
THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 25 KNOTS GUSTING TO 35 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE. A SHIP LOCATED NEAR 15.0° N/ 69.4°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1012.7 AND MAN SURFACE WIND 110/25 KNOTS.

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $50 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHEAST OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $15 \times 10^{-5} \text{S}^{-1}$  TO NORTHEAST OF THE SYSTEM CENTER. A SMALL AREA OF UPPER LEVEL DIVERGENCE IS ABOUT  $5 \times 10^{-5} \text{S}^{-1}$  TO THE EAST OF THE SYSTEM AREA. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. SEA SURFACE TEMPERATURE OVER THE SYSTEM AREA IS 29-30°C AND DECREASES WESTWARD. TROPICAL CYCLONE HEAT POTENTIAL IS 80-90 KJ/CM<sup>2</sup> OVER THE SYSTEM AREA AND DECREASES NORTHWESTWARD. AS THE SYSTEM IS LYING IN AN UNFAVOURABLE CONDITIONS WITH INCREASING WIND SHEAR, THERE IS A POSSIBILITY OF ITS FURTHER WEAKENING INTO A WELL MARKED AREA DURING NEXT 12 HOURS. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

**(NEETHA K GOPAL)**  
**SCIENTIST-E, RSMC, NEW DELHI**



SWA: SOUTHWEST ARABIAN SEA



: 76-100

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.3**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 05.12.2019**

**TO: 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.3 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0900 UTC OF 05.12.2019 BASED ON 0600 UTC OF 05.12.2019.**

**SUB: (A) CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA & (B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA**

**(A) CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA:**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED NORTH-NORTHWESTWARDS WITH A SPEED OF 06 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0600 UTC OF 05<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 09.5°N AND LONGITUDE 56.3°E OVER SOUTHWEST ARABIAN SEA, ABOUT 430 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 800 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 18 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 36 HOURS AND CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 07° & 08°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.12.19/0600	9.5/56.3	65-75 GUSTING TO 85	CYCLONIC STORM
05.12.19/1200	9.5/55.4	70-80 GUSTING TO 90	CYCLONIC STORM
05.12.19/1800	9.2/54.5	70-80 GUSTING TO 90	CYCLONIC STORM
06.12.19/0000	8.8/53.6	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/0600	8.4/52.7	50-60 GUSTING TO 70	DEEP DEPRESSION
06.12.19/1800	7.8/51.0	40-50 GUSTING TO 60	DEPRESSION
07.12.19/0600	7.2/49.0	40-50 GUSTING TO 60	DEPRESSION
07.12.19/1800	6.6/47.2	20-30 GUSTING TO 40	WELL MARKED LOW

**(B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA:**

THE DEPRESSION OVER EASTCENTRAL ARABIAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF 14 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0600 UTC OF 05<sup>TH</sup> DECEMBER, 2019, OVER EASTCENTRAL ARABIAN SEA, NEAR LATITUDE 15.4°N AND LONGITUDE 67.2°E ABOUT 730 KM WEST-SOUTHWEST OF MUMBAI (43003) AND 710 KM OF WEST OF PANJIM (43192). IT IS VERY LIKELY TO MOVE WEST-NORTHWESTWARDS AND WEAKEN GRADUALLY INTO A WELL MARKED LOW PRESSURE AREA DURING NEXT 06 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
05.12.19/0600	15.4/67.2	30-40 GUSTING TO 50	DEPRESSION
05.12.19/1200	15.6/66.5	20-30 GUSTING TO 40	WELL MARKED LOW

**: 76-100**

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

**REMARKS:**

**(A)** AS PER THE SATELLITE IMAGERY OF 0600 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 5.5<sup>0</sup>N TO 16.5<sup>0</sup>N AND LONG 54.0<sup>0</sup>E TO 62.0<sup>0</sup>E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHEAST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. SEA SURFACE TEMPERATURE IS ABOUT 26-27°C AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM2 OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN GRADUALLY BEFORE CROSSING SOMALIA COAST AS THE SYSTEM WILL ENCOUNTER DRY AIR INCURSION AND ALSO DUE TO LOW TCHP VALUES.

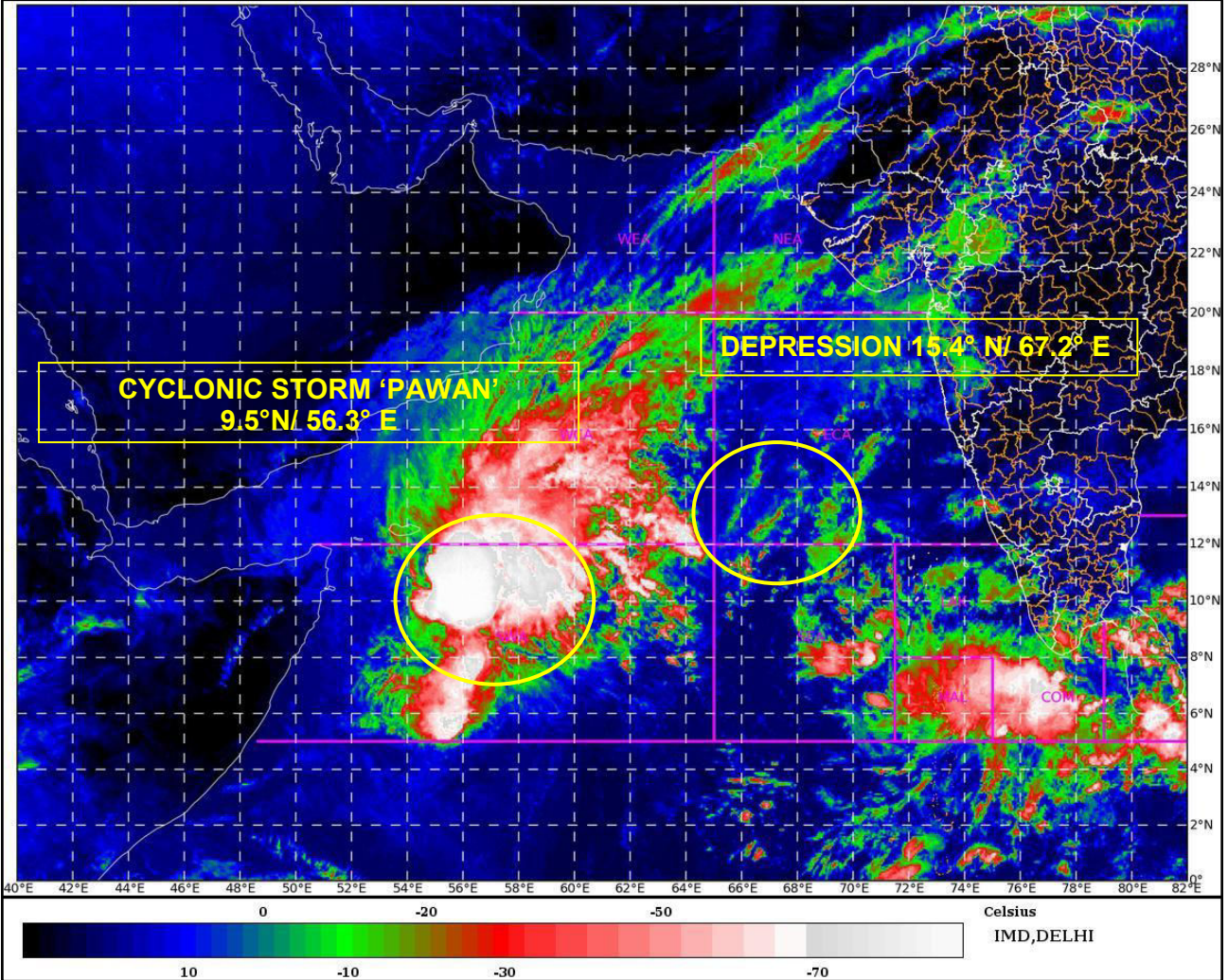
AS THE SYSTEM IS BEING GUIDED BY MID-LEVEL EASTERLIES IT IS LIKELY TO MOVE WESTWARDS FOR SOME TIME. THEREAFTER, IT IS LIKELY TO MOVE SOUTHWESTWARDS UNDER THE INFLUENCE OF AN ANTICYCLONE OVER SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 07° & 08°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

**(B)** AS PER THE SATELLITE IMAGERY OF 0600 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T1.0/1.5. ASSOCIATED BROKEN TO LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER EASTCENTRAL ARABIAN SEA BETWEEN LAT 10.5 N TO 16.0N & LONG 67.5E TO 71.0E . MINIMUM CTT IS MINUS 65 DEG CEL.

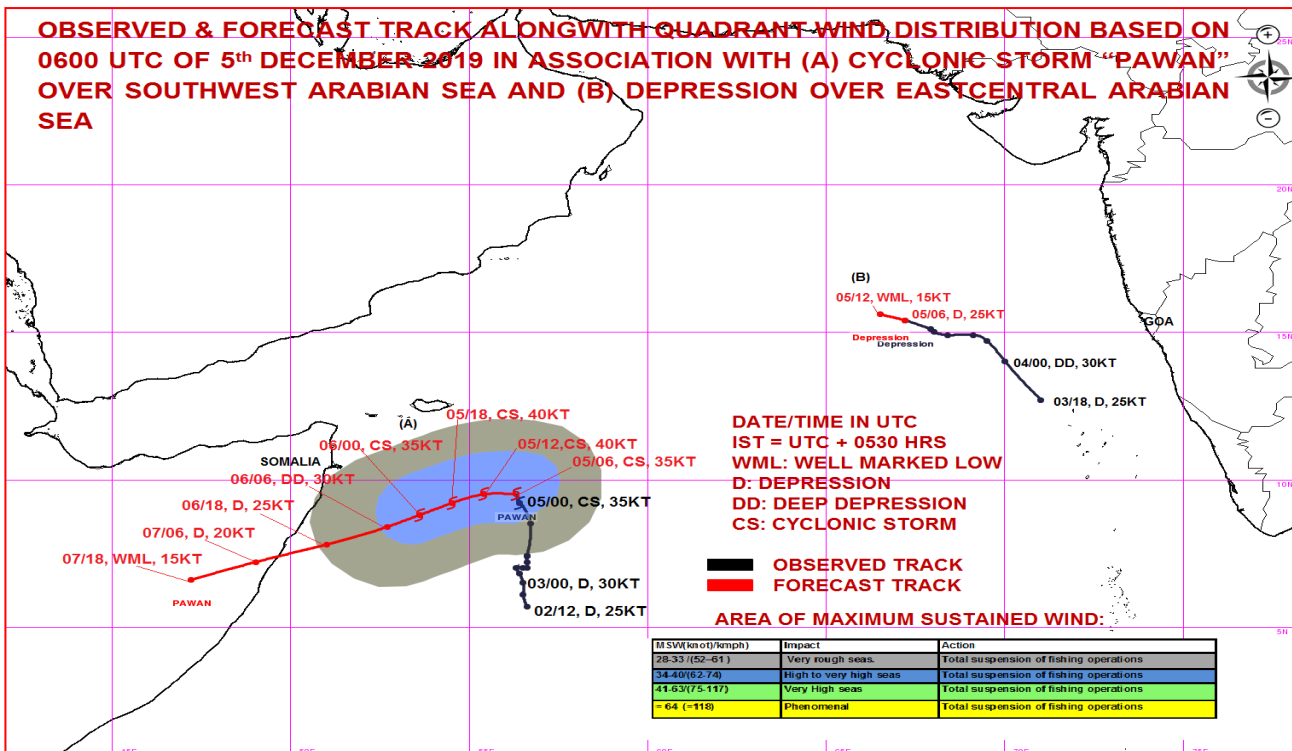
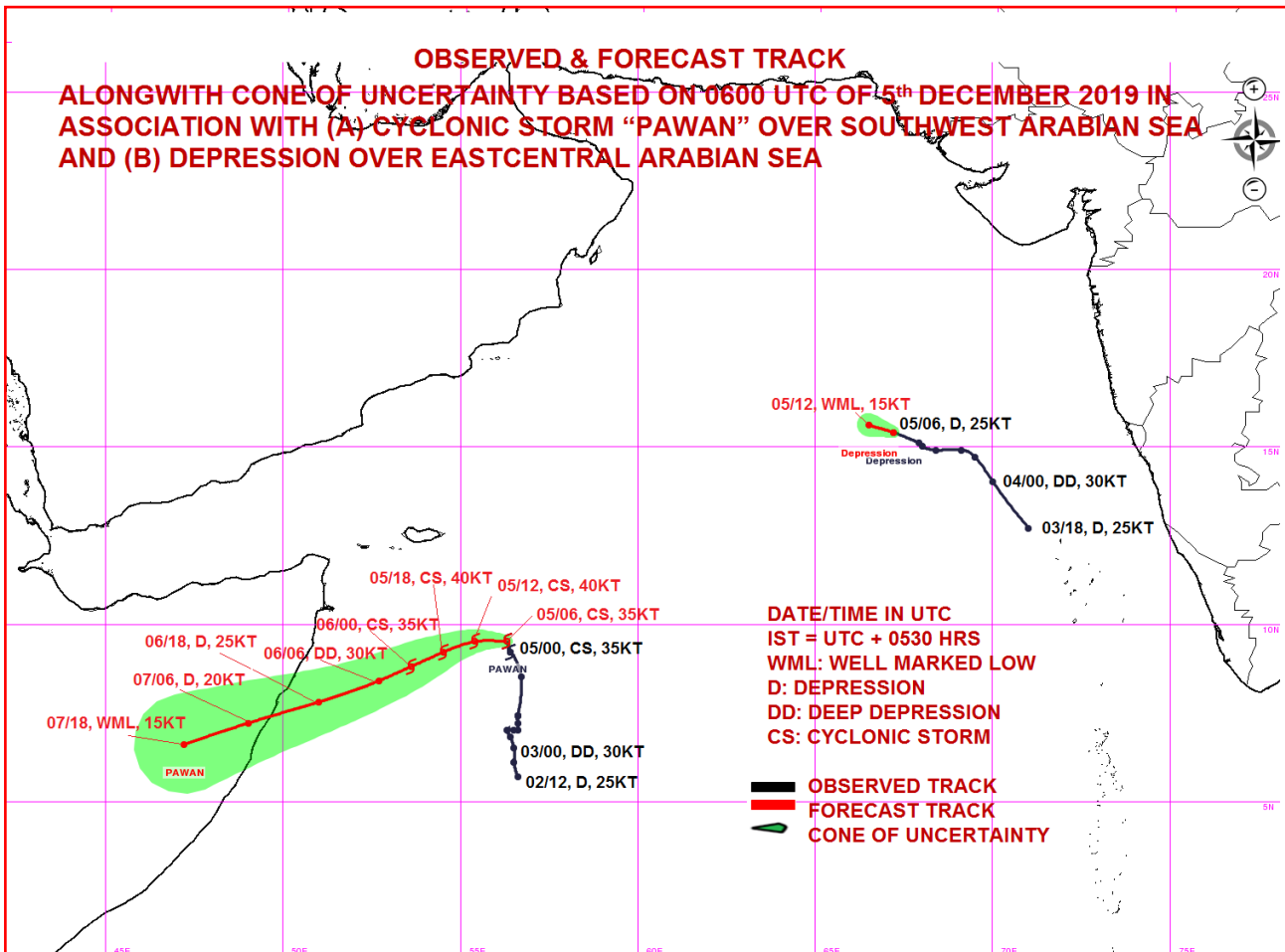
THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 20 KNOTS GUSTING TO 25 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 1002 HPA. THE SEA CONDITION IS ROUGH TO VERY ROUGH AROUND THE SYSTEM CENTRE. A SHIP LOCATED NEAR 15.8° N/ 72.8°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1010.0 HPA AND MEAN SURFACE WIND 110°/19 KNOTS. ANOTHER SHIP LOCATED NEAR 16.3° N/ 71.7°E REPORTED A MEAN SEA LEVEL PRESSURE OF 1015.5 HPA AND MEAN SURFACE WIND 120°/18 KNOTS.

THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $50 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHEAST OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $15 \times 10^{-5} \text{S}^{-1}$  TO NORTHEAST OF THE SYSTEM CENTER. A SMALL AREA OF UPPER LEVEL DIVERGENCE IS ABOUT  $5 \times 10^{-5} \text{S}^{-1}$  TO THE EAST OF THE SYSTEM AREA. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (20-30 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. SEA SURFACE TEMPERATURE OVER THE SYSTEM AREA IS 29-30°C AND DECREASES WESTWARD. TROPICAL CYCLONE HEAT POTENTIAL IS 80-90 KJ/CM2 OVER THE SYSTEM AREA AND DECREASES NORTHWESTWARD. AS THE SYSTEM IS LYING IN AN UNFAVOURABLE CONDITIONS WITH INCREASING WIND SHEAR, THERE IS A POSSIBILITY OF ITS FURTHER WEAKENING INTO A WELL MARKED LOW PRESSURE AREA DURING NEXT 12 HOURS. MOST OF THE GLOBAL MODELS ARE IN AGREEMENT WITH THE ABOVE PROGNOSIS.

**(SUNITHA DEVI S)**  
**SCIENTIST-E, RSMC, NEW DELHI**



SWA: SOUTHWEST ARABIAN SEA



: 76-100

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.5**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 05.12.2019**

**TO: 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.5 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 05.12.2019 BASED ON 1200 UTC OF 05.12.2019.**

**SUB: (A) CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA &  
(B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA WEAKENED INTO A WELL MARKED LOW PRESSURE AREA.**

**(A) CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA:**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF 22 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 1200 UTC OF 05<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 09.6°N AND LONGITUDE 55.1°E OVER SOUTHWEST ARABIAN SEA, ABOUT 360 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 670 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM TILL 0000 UTC OF TOMORROW AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 36 HOURS AND CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 07° & 08°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER.**

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(UTC)	Position (Lat. °N/ long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
05.12.19/1200	9.6/55.1	65-75 gusting to 85	Cyclonic Storm
05.12.19/1800	9.3/54.2	65-75 gusting to 85	Cyclonic Storm
06.12.19/0000	8.9/53.3	65-75 gusting to 85	Cyclonic Storm
06.12.19/0600	8.5/52.4	50-60 gusting to 70	Deep Depression
06.12.19/1200	8.2/51.6	40-50 gusting to 60	Deep Depression
07.12.19/0000	7.7/50.1	40-50 gusting to 60	Depression
07.12.19/1200	7.0/47.8	20-30 gusting to 40	Depression
08.12.19/0000	6.4/45.9	20-30 gusting to 40	Well Marked Low

**(B) DEPRESSION OVER EASTCENTRAL ARABIAN SEA WEAKENED INTO A WELL MARKED LOW PRESSURE AREA:**

THE DEPRESSION OVER EASTCENTRAL ARABIAN SEA MOVED WEST-NORTHWESTWARDS, WEAKENED INTO A WELL MARKED LOW PRESSURE AREA AND LAY OVER EASTCENTRAL ARABIAN SEA AND NEIGHBORHOOD AT 1200 UTC OF 05<sup>TH</sup> DECEMBER 2019.

THIS IS THE LAST BULLETIN FOR THIS SYSTEM.

: 76-100

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

**REMARKS:**

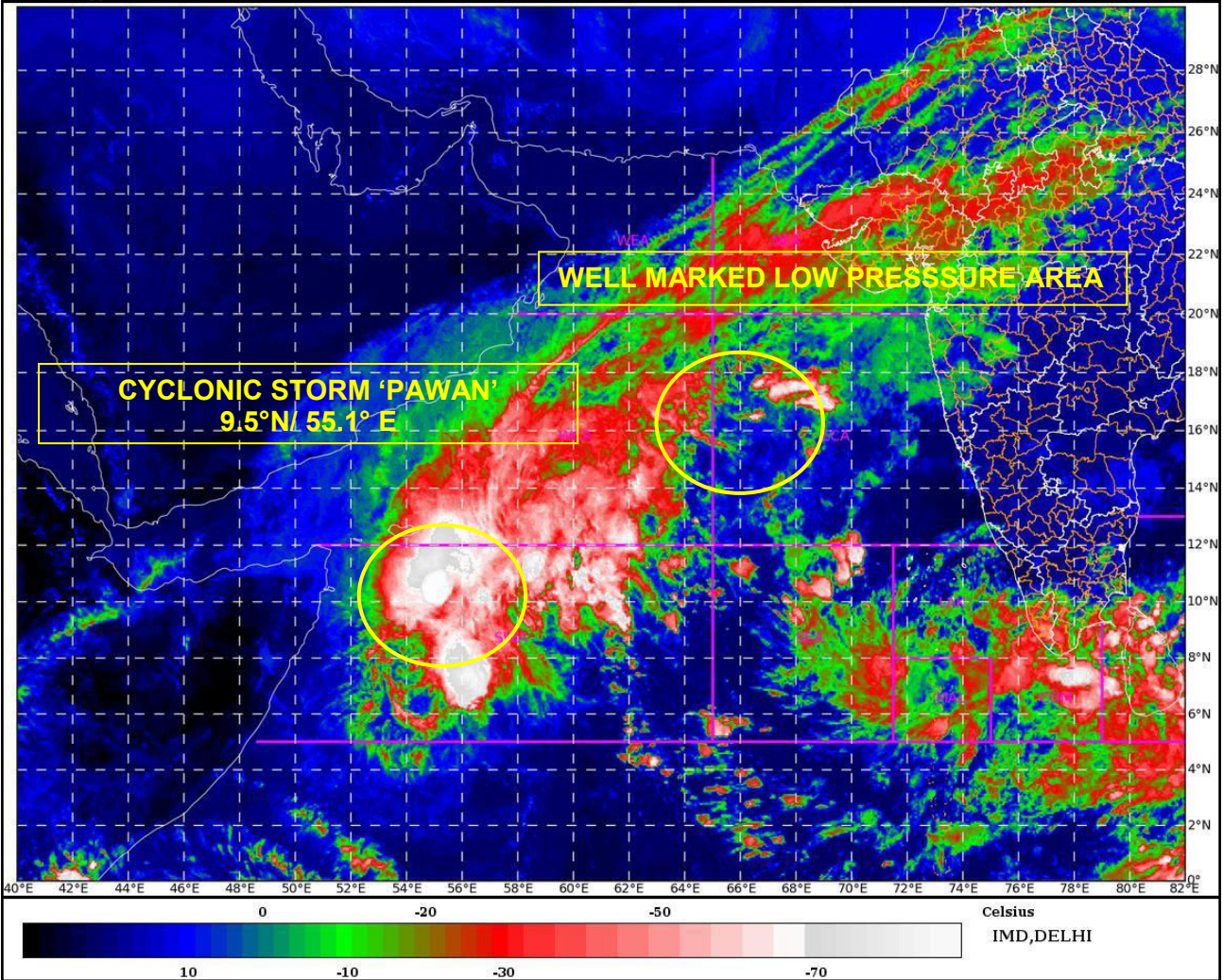
(A) AS PER THE SATELLITE IMAGERY OF 1200 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 5.5<sup>0</sup>N TO 16.5<sup>0</sup>N AND LONG 54.0<sup>0</sup>E TO 62.0<sup>0</sup>E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHWEST THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG 13° N. SEA SURFACE TEMPERATURE IS ABOUT 26-27°C AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM<sup>2</sup> OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN GRADUALLY BEFORE CROSSING SOMALIA COAST, AS THE SYSTEM WILL ENCOUNTER DRY AIR INCURSION AND ALSO DUE TO LOW TCHP VALUES.

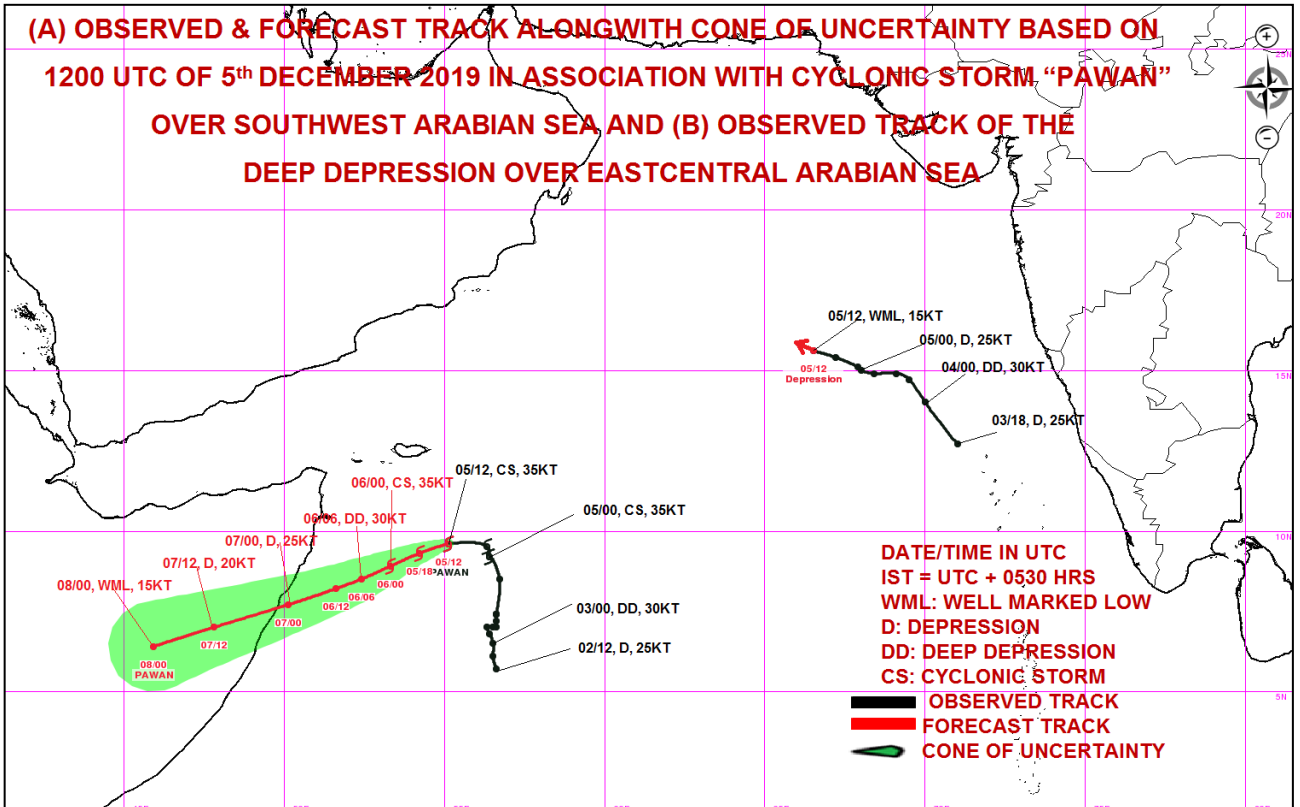
AS THE SYSTEM IS BEING GUIDED BY MID-LEVEL EASTERLIES IT IS LIKELY TO MOVE WESTWARDS FOR SOME TIME. THEREAFTER, IT IS LIKELY TO MOVE SOUTHWESTWARDS UNDER THE INFLUENCE OF AN ANTICYCLONE OVER SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 07° & 08°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(SUNITHA DEVI S)  
SCIENTIST-E, RSMC, NEW DELHI

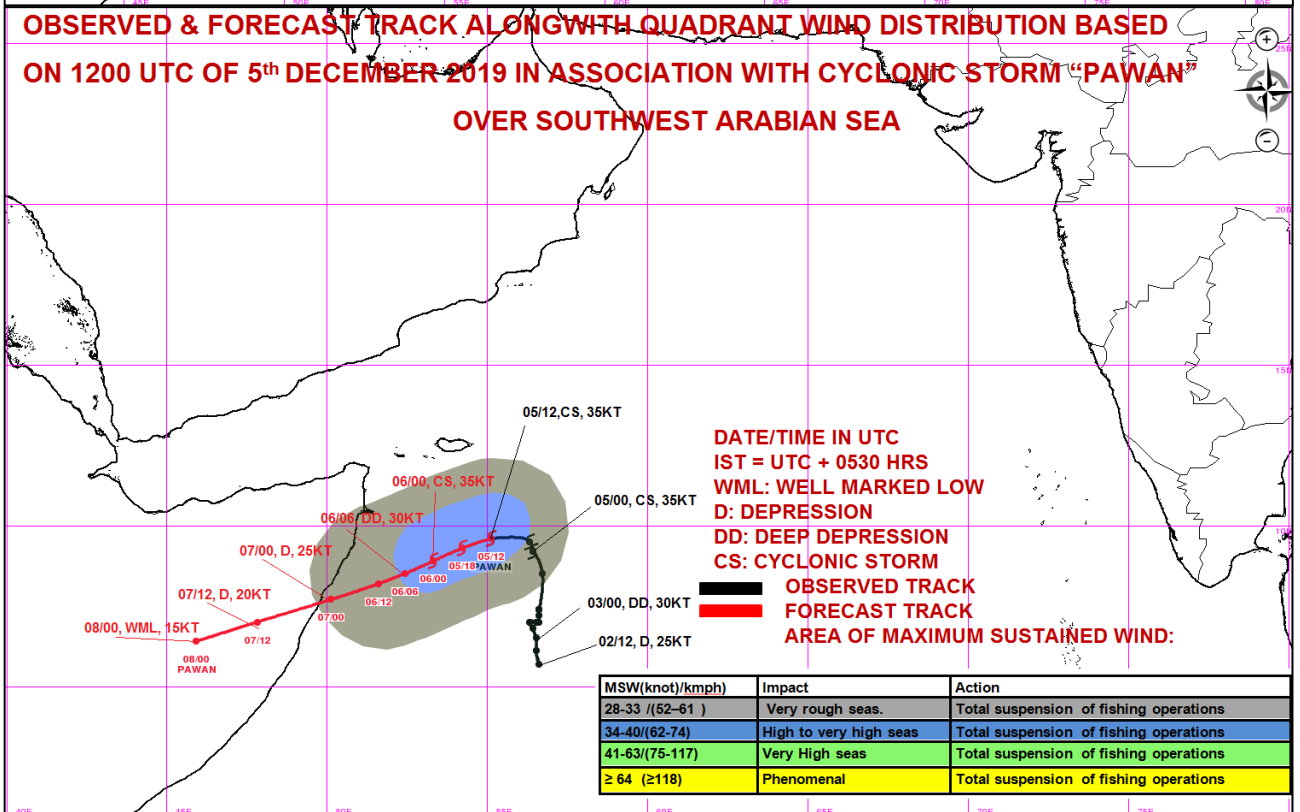


SWA: SOUTHWEST ARABIAN SEA

**(A) OBSERVED & FORECAST TRACK ALONG WITH CONE OF UNCERTAINTY BASED ON 1200 UTC OF 5<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA AND (B) OBSERVED TRACK OF THE DEEP DEPRESSION OVER EASTCENTRAL ARABIAN SEA**



**OBSERVED & FORECAST TRACK ALONG WITH QUADRANT WIND DISTRIBUTION BASED ON 1200 UTC OF 5<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA**







**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.6**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 05.12.2019**

**TO: 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.6 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1800 UTC OF 05.12.2019 BASED ON 1500 UTC OF 05.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA &**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WEST-NORTHWESTWARDS WITH A SPEED OF 13 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 1500 UTC OF 05<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 09.6°N AND LONGITUDE 54.9°E OVER SOUTHWEST ARABIAN SEA, ABOUT 350 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 650 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM TILL 0000 UTC OF TOMORROW AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 36 HOURS AND CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 07° & 08°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(UTC)	Position (Lat. °N/ long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
05.12.19/1500	9.6/54.9	65-75 gusting to 85	Cyclonic Storm
05.12.19/1800	9.3/54.2	65-75 gusting to 85	Cyclonic Storm
06.12.19/0000	8.9/53.3	65-75 gusting to 85	Cyclonic Storm
06.12.19/0600	8.5/52.4	50-60 gusting to 70	Deep Depression
06.12.19/1200	8.2/51.6	40-50 gusting to 60	Deep Depression
07.12.19/0000	7.7/50.1	40-50 gusting to 60	Depression
07.12.19/1200	7.0/47.8	20-30 gusting to 40	Depression
08.12.19/0000	6.4/45.9	20-30 gusting to 40	Well Marked Low

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 1500 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 6.0°N TO 12.0°N AND LONG 53.5°E TO 57.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE

**: 76-100**

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

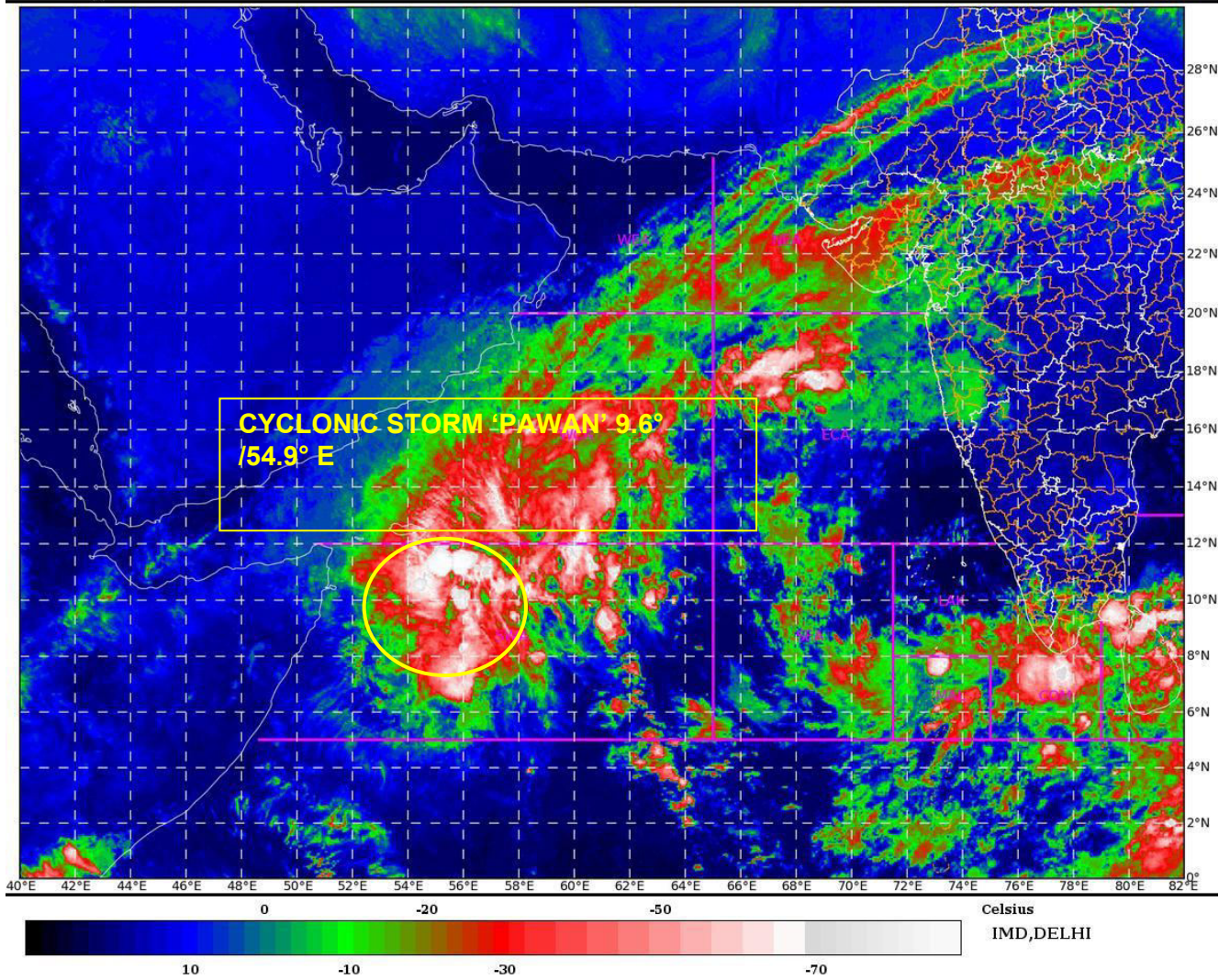
LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHWEST THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^\circ \text{ N}$ . SEA SURFACE TEMPERATURE IS ABOUT  $26-27^\circ \text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM<sup>2</sup> OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN GRADUALLY BEFORE CROSSING SOMALIA COAST, AS THE SYSTEM WILL ENCOUNTER DRY AIR INCURSION AND ALSO DUE TO LOW TCHP VALUES.

AS THE SYSTEM IS BEING GUIDED BY MID-LEVEL EASTERLIES IT IS LIKELY TO MOVE WESTWARDS FOR SOME TIME. THEREAFTER, IT IS LIKELY TO MOVE SOUTHWESTWARDS UNDER THE INFLUENCE OF AN ANTICYCLONE OVER SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES  $07^\circ$  &  $08^\circ \text{N}$  DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(D.R. Patnaik)  
SCIENTIST-E, RSMC, NEW DELHI

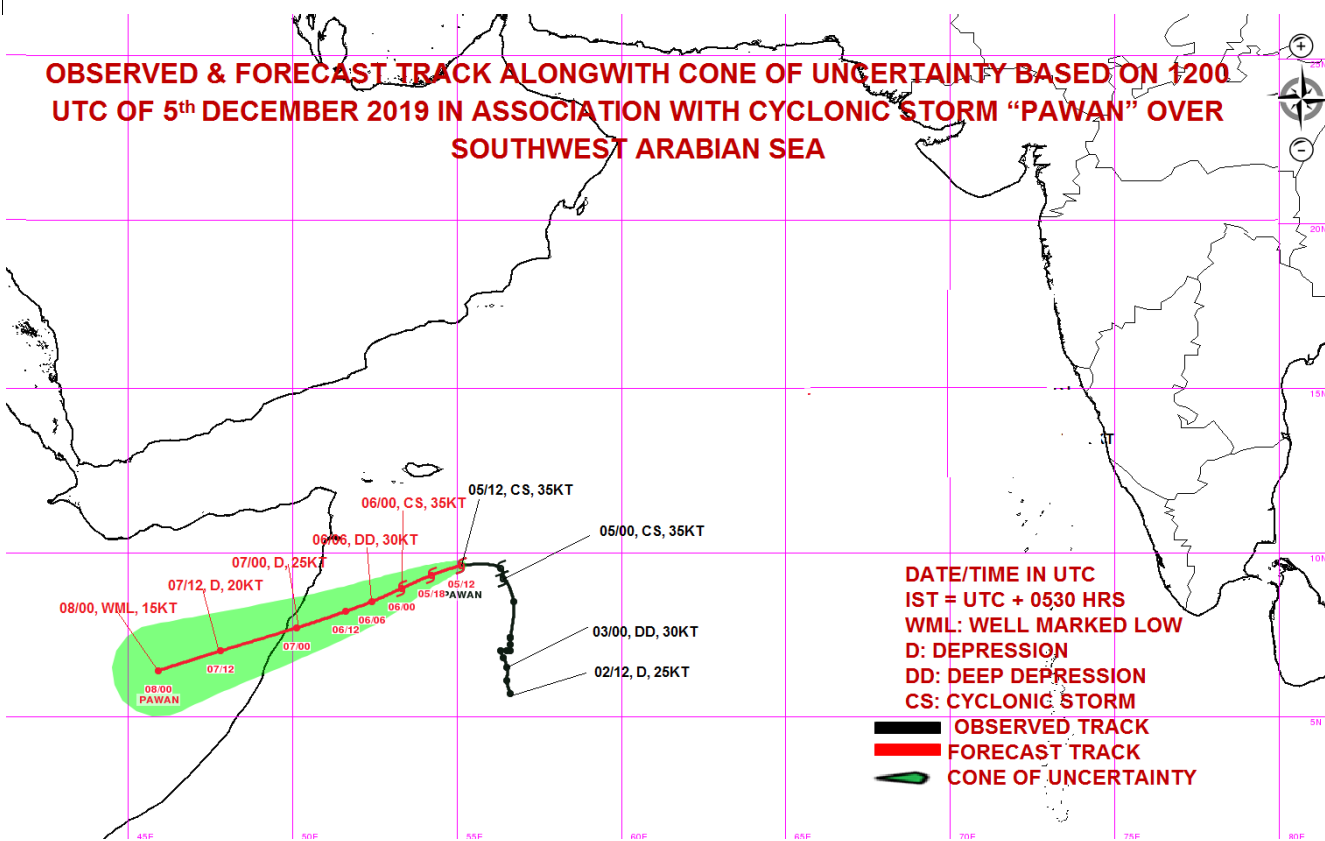
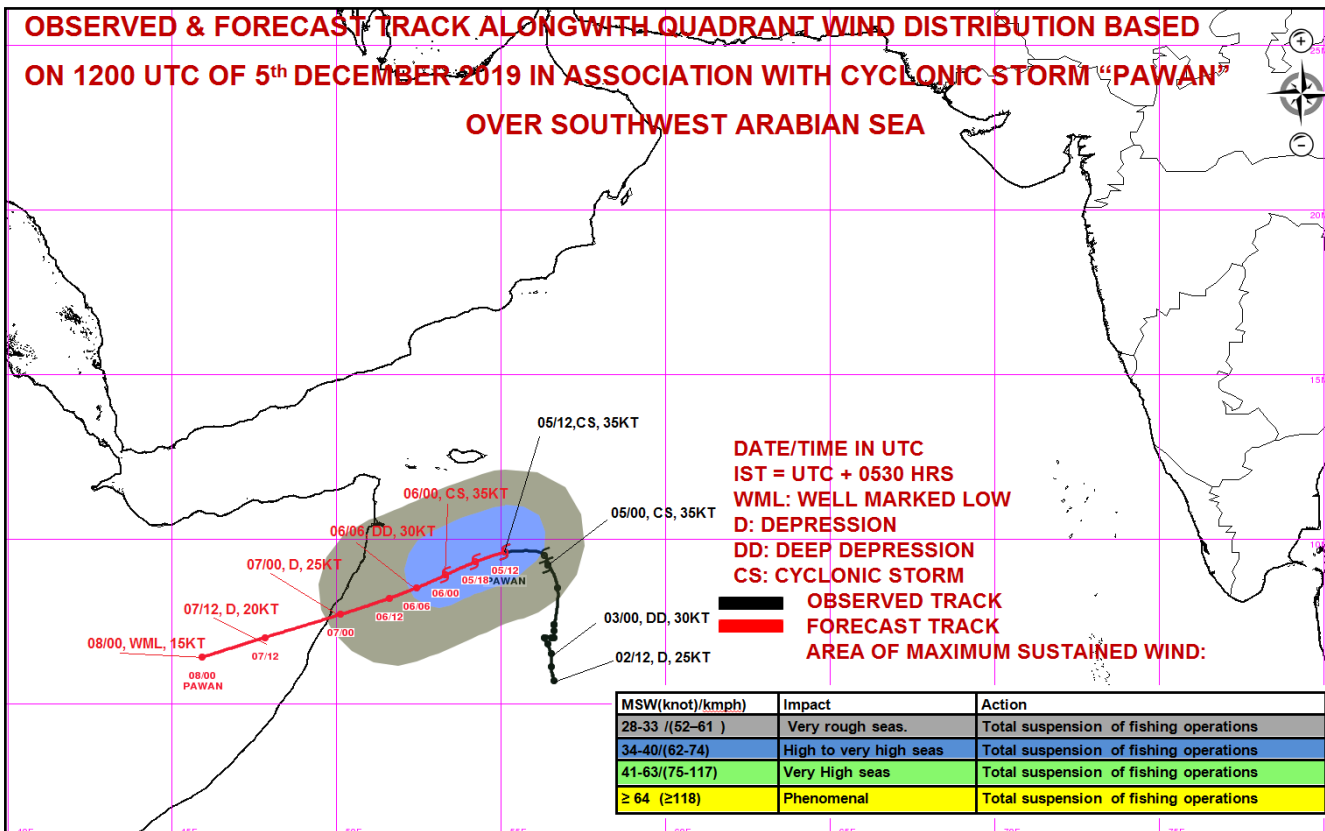
SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN SEA

05-12-2019/(1600 to 1626) GMT  
05-12-2019/(2130 to 2156) IST



SWA: Southwest Arabian Sea

: 76-100  
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%



: 76-100  
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.7**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 05.12.2019**

**TO: 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.7 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2030 UTC OF 05.12.2019 BASED ON 1800 UTC OF 05.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 12 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 1800 UTC OF 05<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 09.3°N AND LONGITUDE 54.5°E OVER SOUTHWEST ARABIAN SEA, ABOUT 375 KM SOUTH-SOUTHEAST OF SOCOTRA (41494) AND 620 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM TILL 0000 UTC OF 06<sup>TH</sup> DECEMBER, 2019 AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 36 HOURS AND CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 07° & 08°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(UTC)	Position (Lat. °N/ long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
05.12.19/1800	9.3/54.5	65-75 gusting to 85	Cyclonic Storm
06.12.19/0000	8.9/53.6	60-70 gusting to 80	Cyclonic Storm
06.12.19/0600	8.6/52.7	55-65 gusting to 75	Deep Depression
06.12.19/1200	8.3/51.9	50-60 gusting to 70	Deep Depression
06.12.19/1800	7.8/50.6	45-55 gusting to 65	Depression
07.12.19/0600	6.8/48.2	35-45 gusting to 55	Depression
07.12.19/1800	6.0/46.0	25-35 gusting to 45	Well Marked Low

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 1800 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 8.0°N TO 12.5°N AND LONG 53.5°E TO 57.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHWEST THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND IS

**: 76-100**

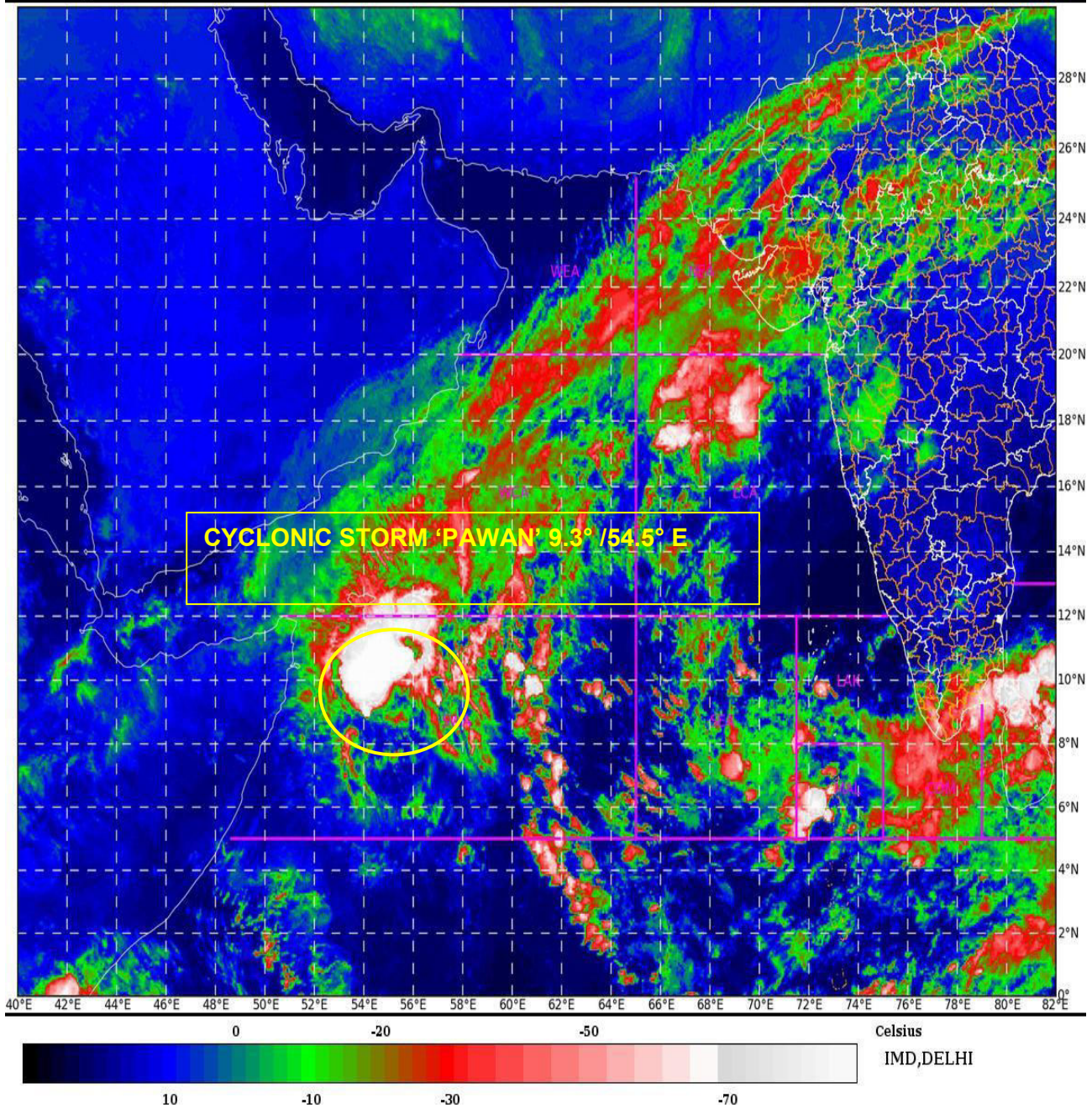
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM<sup>2</sup> OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 06 HOURS AND WEAKEN GRADUALLY BEFORE CROSSING SOMALIA COAST, AS THE SYSTEM WILL ENCOUNTER DRY AIR INCURSION AND ALSO DUE TO LOW TCHP VALUES.

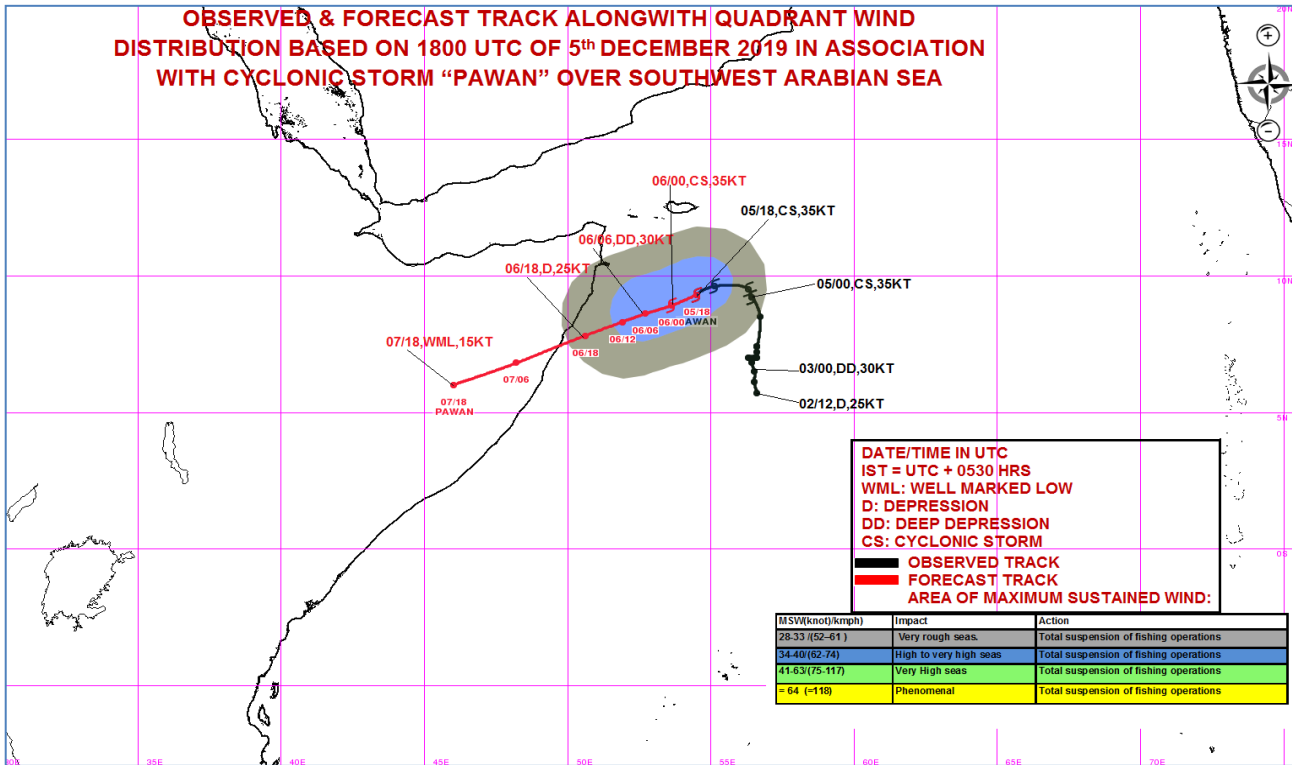
AS THE SYSTEM IS BEING GUIDED BY MID-LEVEL EASTERLIES IT IS LIKELY TO MOVE WESTWARDS FOR SOME TIME. THEREAFTER, IT IS LIKELY TO MOVE SOUTHWESTWARDS UNDER THE INFLUENCE OF AN ANTICYCLONE OVER SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES  $07^{\circ}$  &  $08^{\circ}$ N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(D.R. Patnaik)  
SCIENTIST-E, RSMC, NEW DELHI

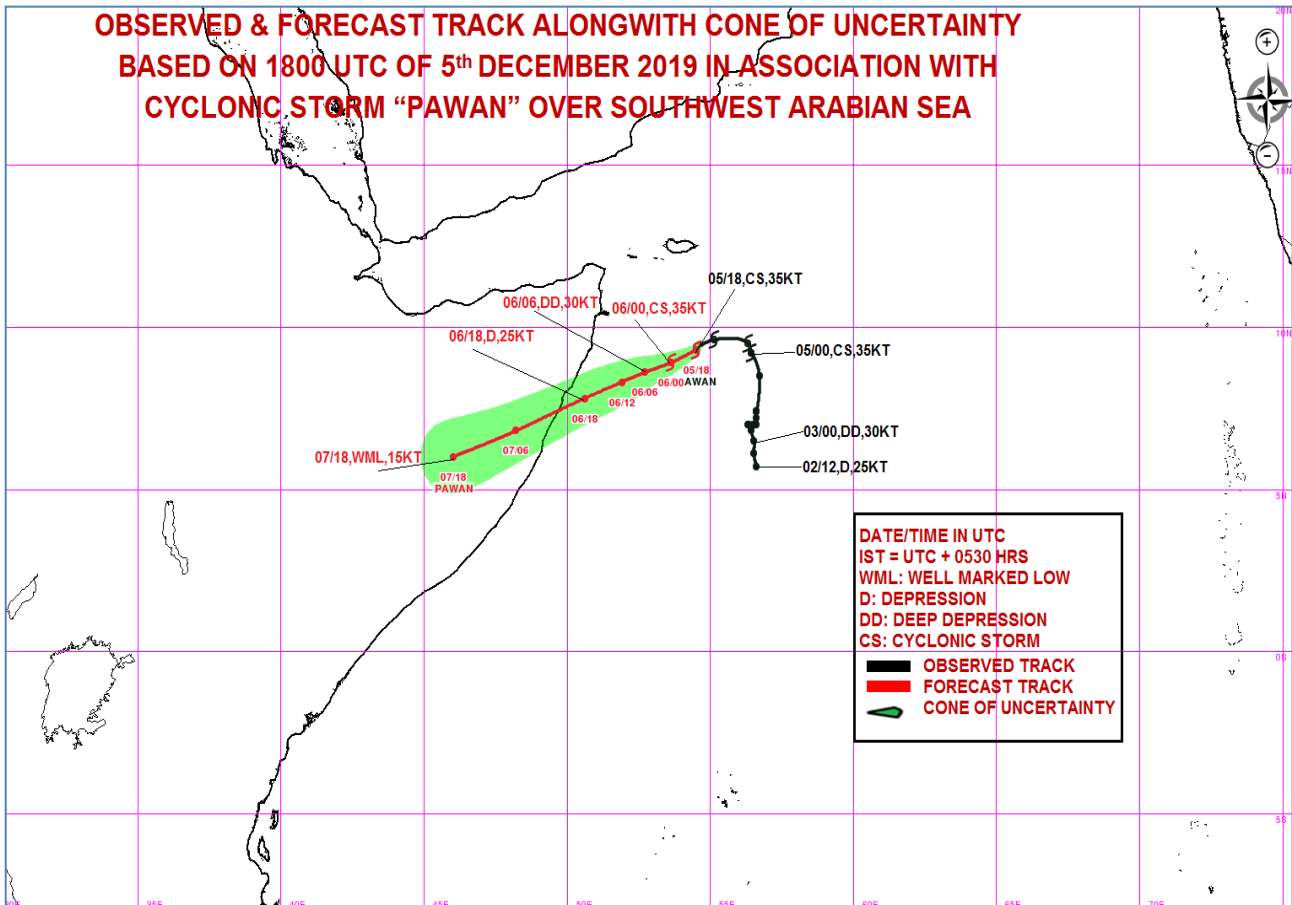


SWA: Southwest Arabian Sea

**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION BASED ON 1800 UTC OF 5<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA**



**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY BASED ON 1800 UTC OF 5<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA**



: 76-100

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.8**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 06.12.2019**

**TO: 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.8 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0000UTC OF 06.12.2019 BASED ON 2100 UTC OF 05.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED SOUTHWESTWARDS WITH A SPEED OF 20 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 2100 UTC OF 05<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 09.0°N AND LONGITUDE 54.0°E OVER SOUTHWEST ARABIAN SEA, ABOUT 400 KM NEARLY SOUTH OF SOCOTRA (41494) AND 585 KM EAST-SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM TILL 0000 UTC OF 06<sup>TH</sup> DECEMBER, 2019 AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 36 HOURS AND CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES 07° & 08°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(UTC)	Position (Lat. °N/ long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
05.12.19/2100	9.0/54.0	65-75 gusting to 85	Cyclonic Storm
06.12.19/0000	8.9/53.6	60-70 gusting to 80	Cyclonic Storm
06.12.19/0600	8.6/52.7	55-65 gusting to 75	Deep Depression
06.12.19/1200	8.3/51.9	50-60 gusting to 70	Deep Depression
06.12.19/1800	7.8/50.6	45-55 gusting to 65	Depression
07.12.19/0600	6.8/48.2	35-45 gusting to 55	Depression
07.12.19/1800	6.0/46.0	25-35 gusting to 45	Well Marked Low

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 2100 UTC ON 05<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 7.5°N TO 12.0°N AND LONG 52.0°E TO 56.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHWEST THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND IS

**: 76-100**

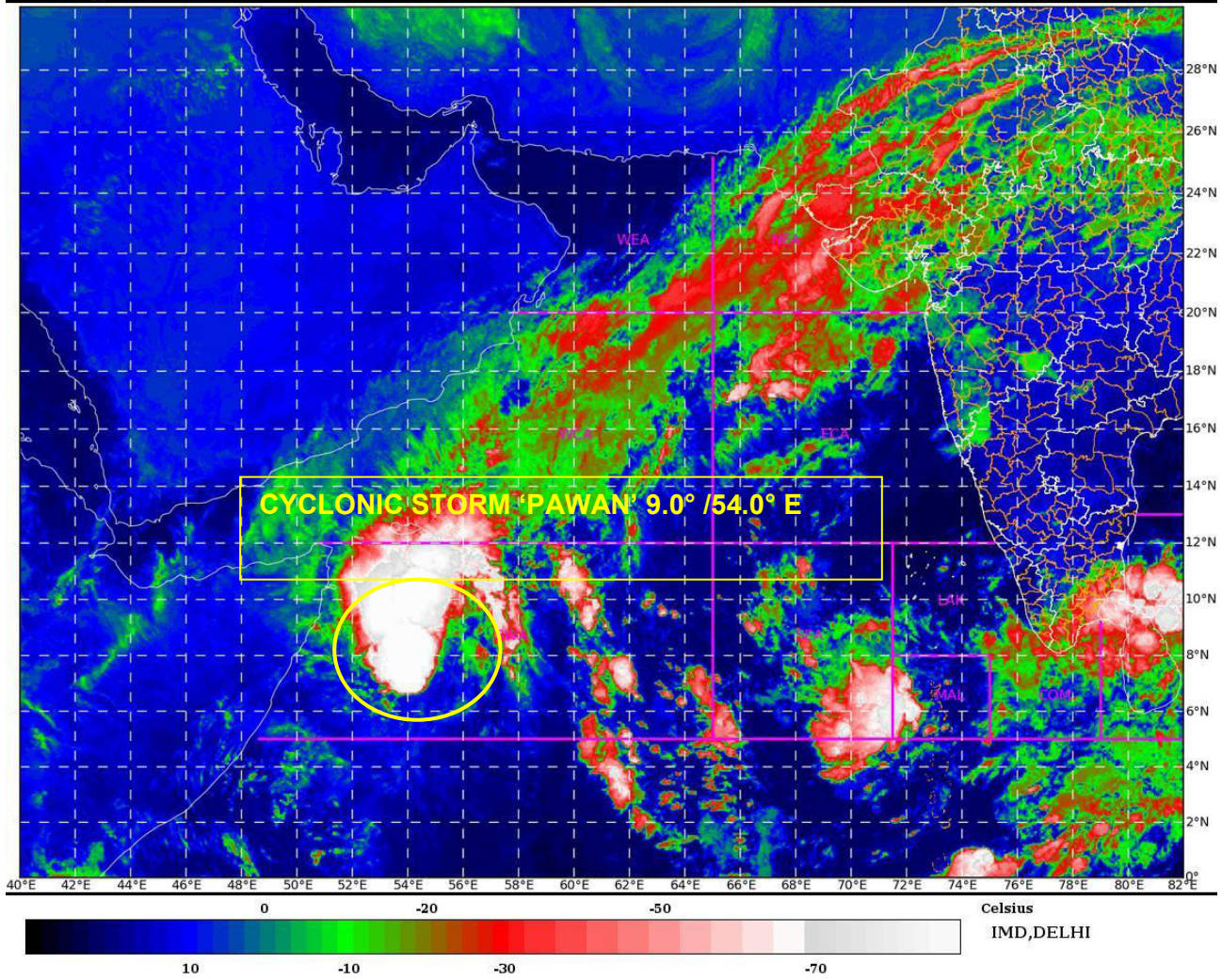
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM<sup>2</sup> OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 06 HOURS AND WEAKEN GRADUALLY BEFORE CROSSING SOMALIA COAST, AS THE SYSTEM WILL ENCOUNTER DRY AIR INCURSION AND ALSO DUE TO LOW TCHP VALUES.

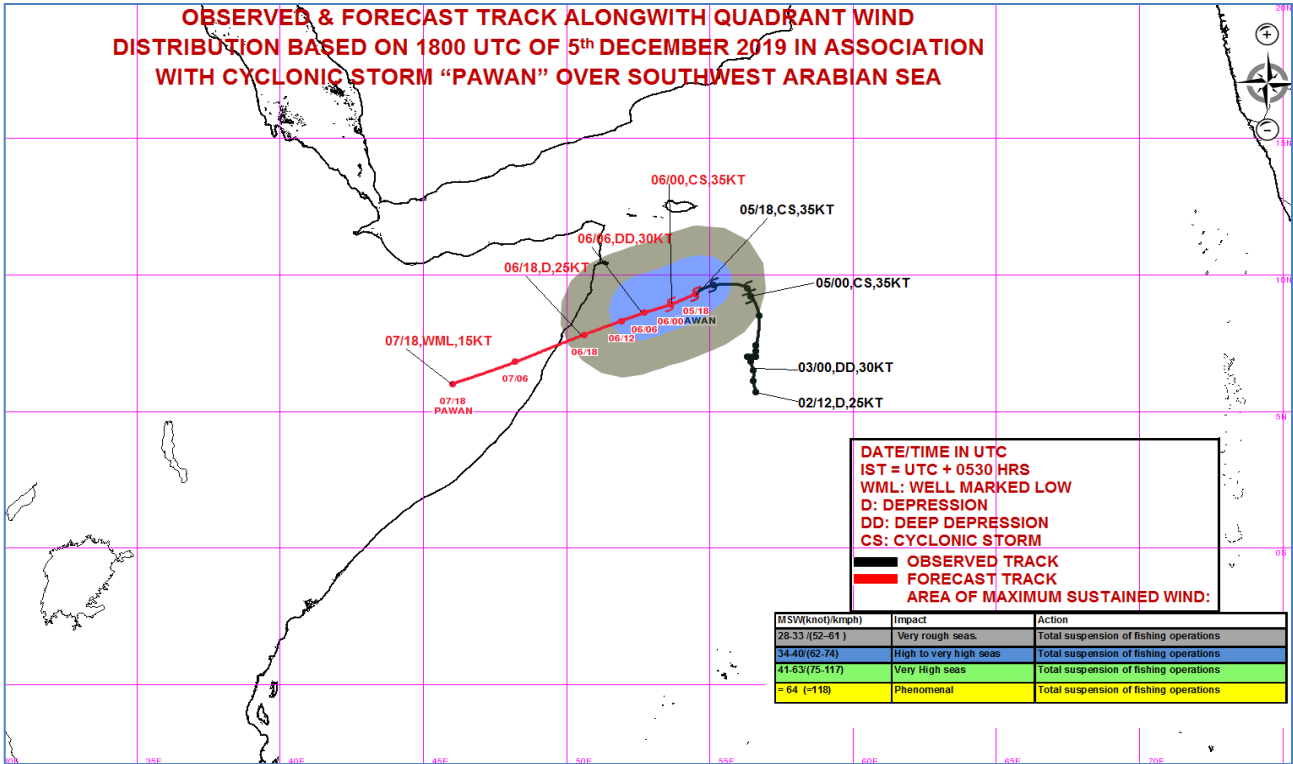
AS THE SYSTEM IS BEING GUIDED BY MID-LEVEL EASTERLIES IT IS LIKELY TO MOVE WESTWARDS FOR SOME TIME. THEREAFTER, IT IS LIKELY TO MOVE SOUTHWESTWARDS UNDER THE INFLUENCE OF AN ANTICYCLONE OVER SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEPRESSION BETWEEN LATITUDES  $07^{\circ}$  &  $08^{\circ}$ N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(D.R. Pattnaik)  
SCIENTIST-E, RSMC, NEW DELHI

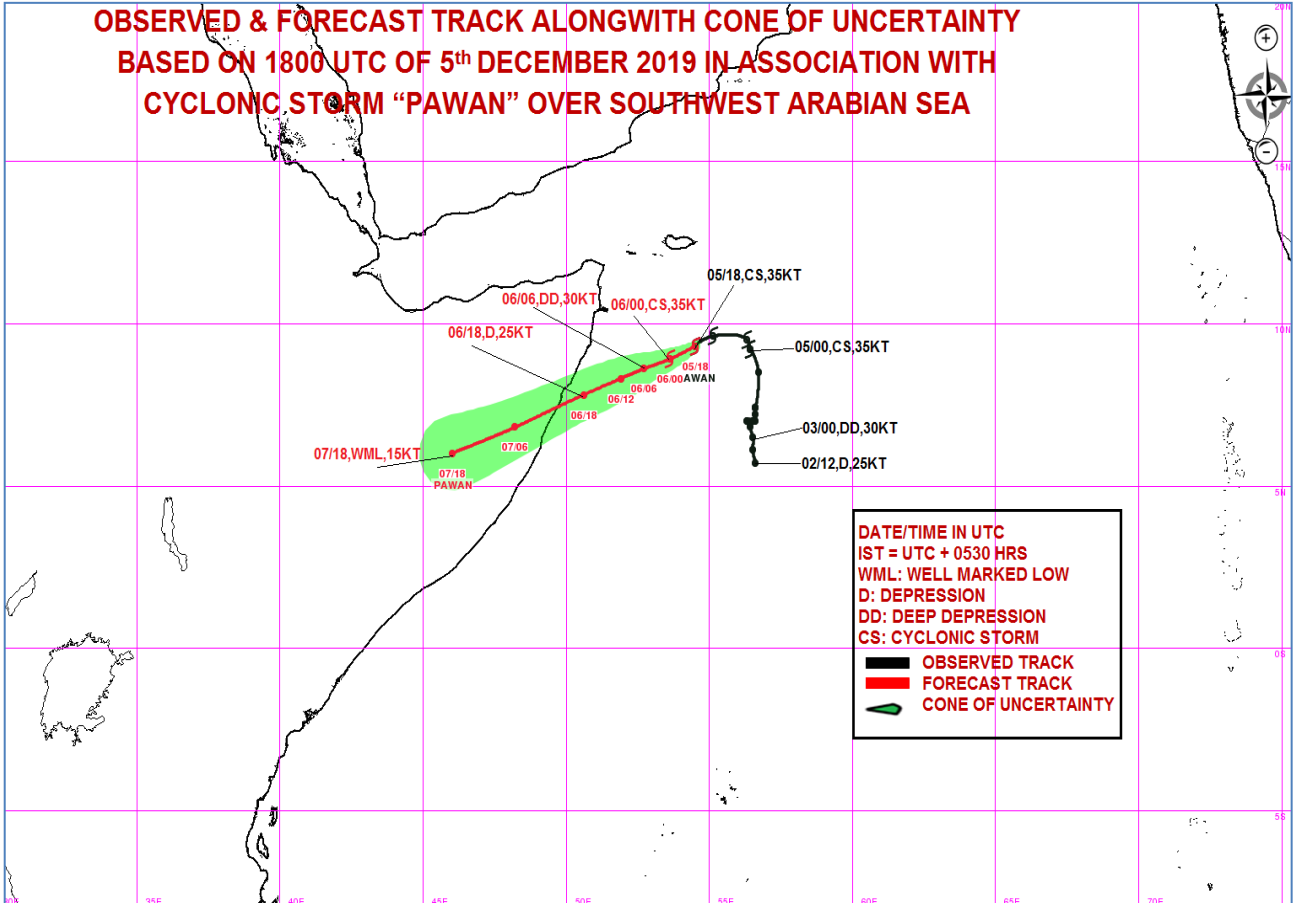


SWA: Southwest Arabian Sea

**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION BASED ON 1800 UTC OF 5<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA**



**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY BASED ON 1800 UTC OF 5<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA**



: 76-100

PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)

NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.9**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 06.12.2019**

**TO: 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.9 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0300UTC OF 06.12.2019 BASED ON 0000 UTC OF 06.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 26 KMPH DURING PAST 06 HOURS AND LAY CENTRED AT 0000 UTC OF 06<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 08.5°N AND LONGITUDE 53.3°E OVER SOUTHWEST ARABIAN SEA, ABOUT 460 KM SOUTH-SOUTHWEST OF SOCOIRA (41494) AND 540 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 06 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 24 HOURS AND CROSS SOMALIA COAST AS A DEPRESSION AROUND LATITUDE 07°N DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER, 2019.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

Date/Time(UTC)	Position (Lat. °N/ long. °E)	Maximum sustained surface wind speed (Kmph)	Category of cyclonic disturbance
06.12.19/0000	8.5/53.3	65-75 gusting to 85	Cyclonic Storm
06.12.19/0600	8.2/52.4	60-70 gusting to 80	Cyclonic Storm
06.12.19/1200	7.8/51.6	55-65 gusting to 75	Deep Depression
06.12.19/1800	7.3/50.5	50-60 gusting to 70	Deep Depression
07.12.19/0000	7.0/49.6	45-55 gusting to 65	Depression
07.12.19/1200	6.1/46.9	40-50 gusting to 60	Depression
08.12.19/0000	5.4/45.5	25-35 gusting to 45	Well Marked Low

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 0000 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 5.5°N TO 12.0°N AND LONG 51.5°E TO 56.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHWEST THE SYSTEM CENTRE. POSITIVE VORTICITY IS EXTENDING UPTO 200 HPA LEVEL. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND IS

**: 76-100**

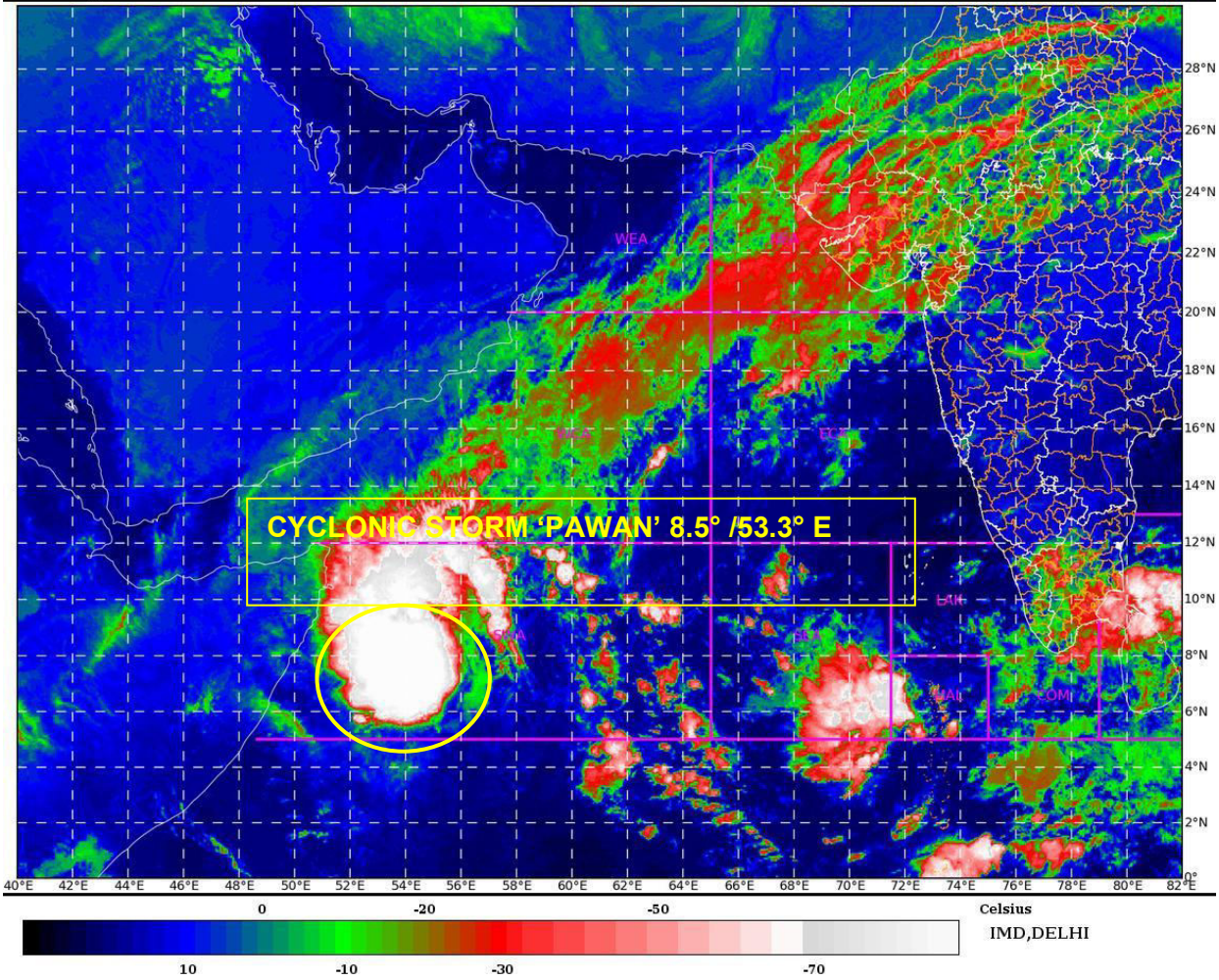
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

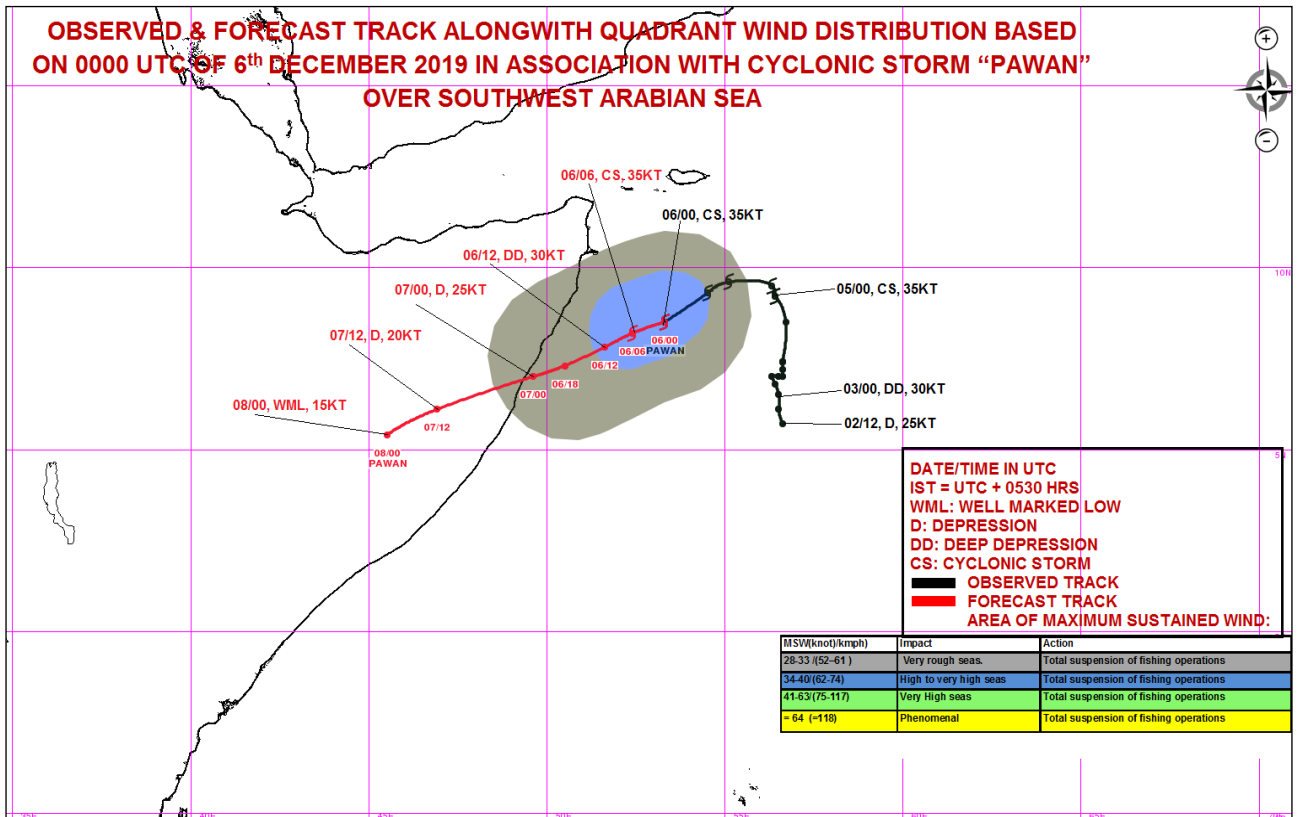
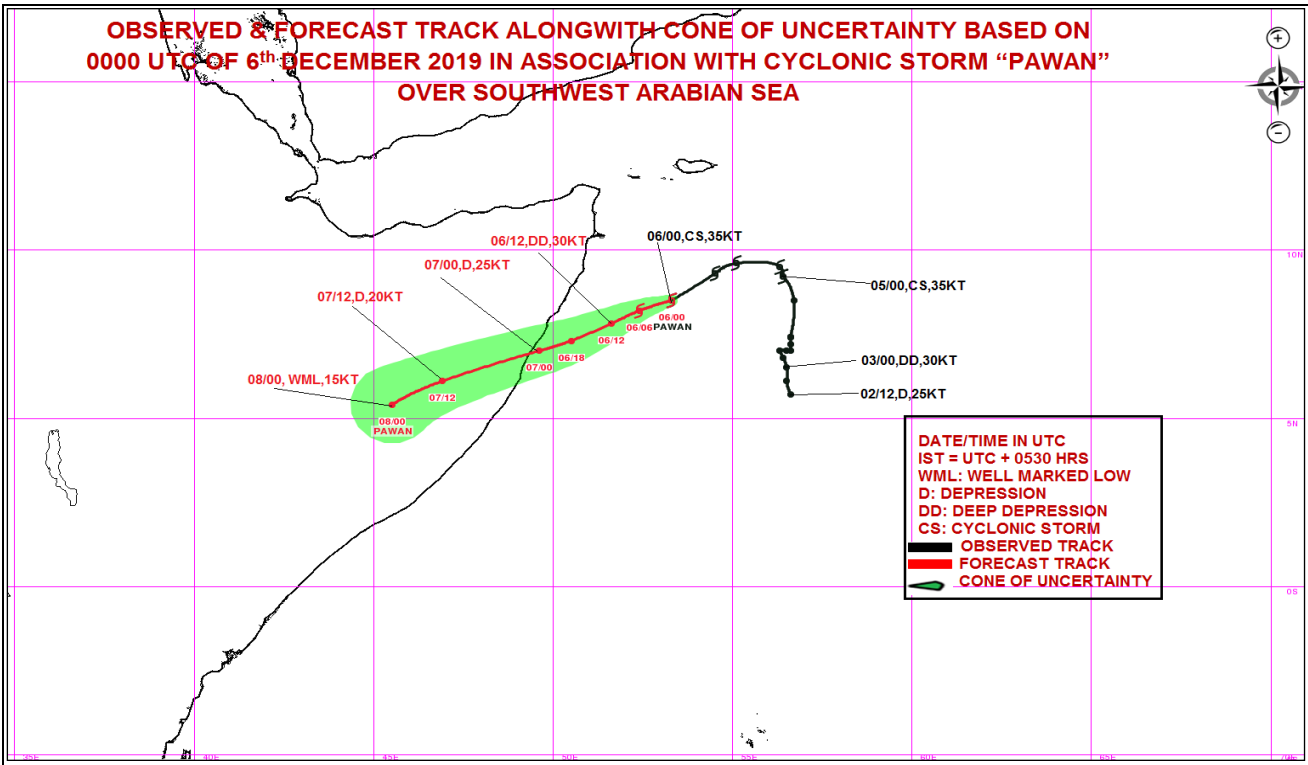
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS MODERATE TO HIGH (15-25 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM<sup>2</sup> OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 06 HOURS AND WEAKEN GRADUALLY BEFORE CROSSING SOMALIA COAST, AS THE SYSTEM WILL ENCOUNTER DRY AIR INCURSION AND ALSO DUE TO LOW TCHP VALUES.

AS THE SYSTEM IS BEING GUIDED BY MID-LEVEL EASTERLIES IT IS LIKELY TO MOVE WESTWARDS FOR SOME TIME. THEREAFTER, IT IS LIKELY TO MOVE SOUTHWESTWARDS UNDER THE INFLUENCE OF AN ANTICYCLONE OVER SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEPRESSION AROUND LATITUDES  $07^{\circ}$  DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

(D.R. Pattnaik)  
SCIENTIST-E, RSMC, NEW DELHI





: 76-100  
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVIORY BULLETIN NO.10**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 06.12.2019**

**TO: 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.10 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0600UTC OF 06.12.2019 BASED ON 0300 UTC OF 06.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 24 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 0300 UTC OF 06<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 8.1°N AND LONGITUDE 53.0°E OVER SOUTHWEST ARABIAN SEA, ABOUT 510 KM SOUTH-SOUTHWEST OF SOCOTRA (41494) AND 540 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 06 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 24 HOURS AND CROSS SOMALIA COAST AS A DEPRESSION CLOSE TO LATITUDE 07°N (AROUND GARACAD, MUDUG) DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME (UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.12.19/0300	8.1/53.0	65-75 GUSTING TO 85	CYCLONIC STORM
06.12.19/0600	7.8/52.4	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/1200	7.5/51.6	55-65 GUSTING TO 75	DEEP DEPRESSION
06.12.19/1800	7.2/50.5	50-60 GUSTING TO 70	DEEP DEPRESSION
07.12.19/0000	6.9/49.6	45-55 GUSTING TO 65	DEPRESSION
07.12.19/1200	6.2/47.6	40-50 GUSTING TO 60	DEPRESSION
08.12.19/0000	5.5/45.5	25-35 GUSTING TO 45	WELL MARKED LOW

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 0300 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 5.5°N TO 13.0°N AND LONG 50.5°E TO 56.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

**: 76-100  
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**

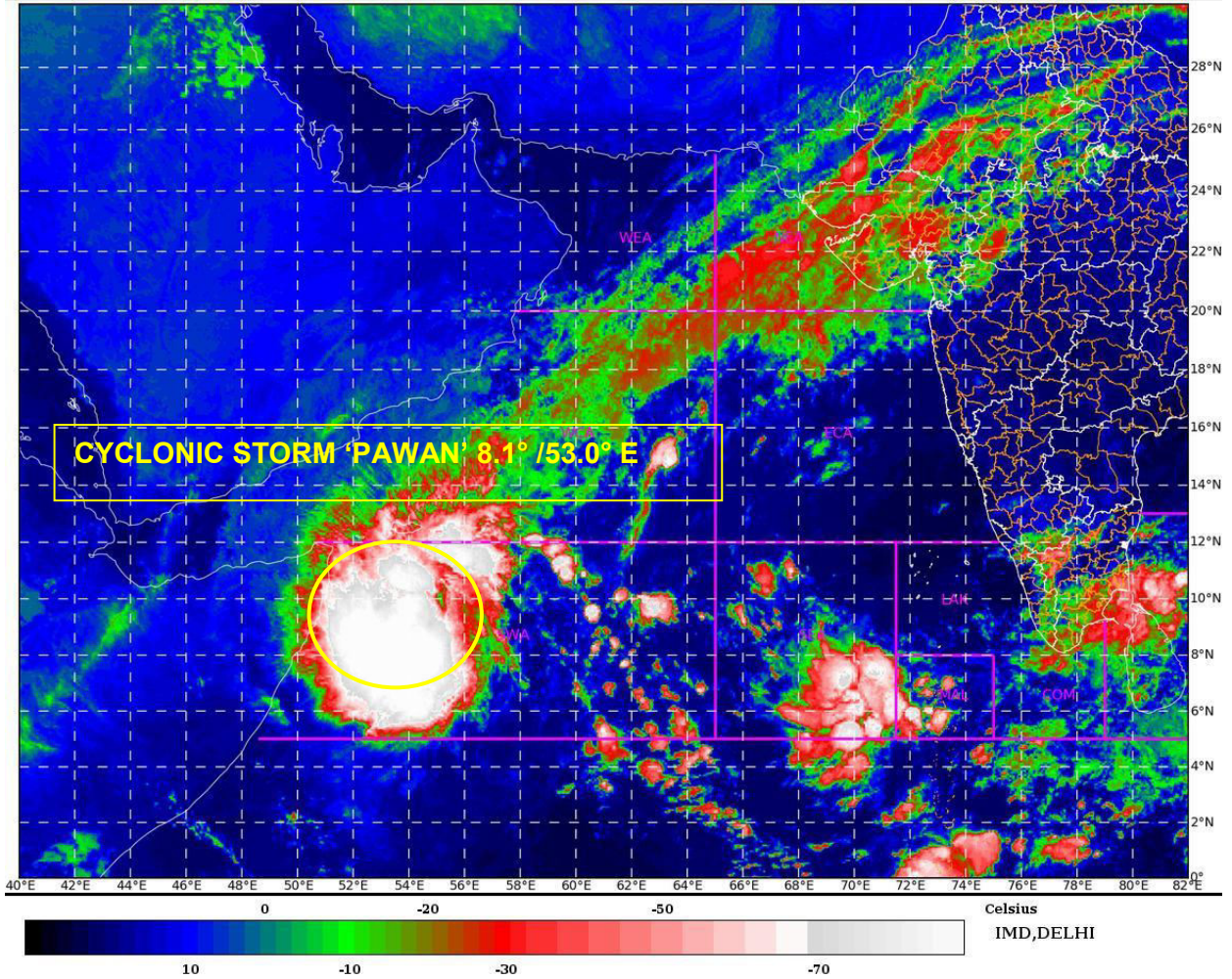
THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHWEST THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR DECREASED AND IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^\circ \text{N}$ . SEA SURFACE TEMPERATURE IS ABOUT  $26-27^\circ \text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS  $30-40 \text{KJ}/\text{CM}^2$  OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 06 HOURS AND WEAKEN GRADUALLY BEFORE CROSSING SOMALIA COAST, AS THE SYSTEM WILL ENCOUNTER DRY AIR INCURSION AND ALSO DUE TO LOW TCHP VALUES.

THE SYSTEM IS LIKELY TO MOVE WEST-SOUTHWESTWARDS UNDER THE INFLUENCE OF THE ANTICYCLONE TO THE WEST OF SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEPRESSION AROUND LATITUDE  $07^\circ \text{N}$  DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

**(NEETHA K GOPAL)**  
**SCIENTIST-E, RSMC, NEW DELHI**

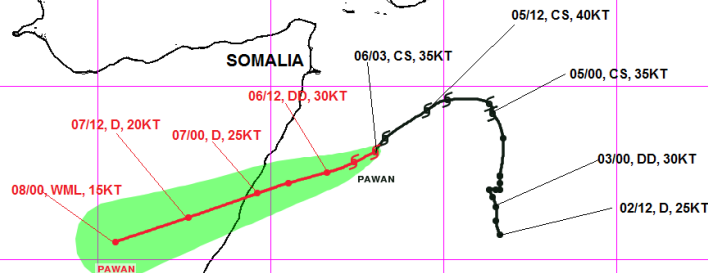
SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN\_SEA

06-12-2019/(0330 to 0357) GMT  
06-12-2019/(0900 to 0927) IST



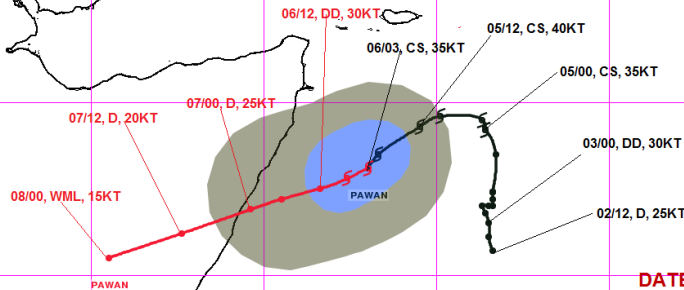
: 76-100  
PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%

**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY BASED ON 0300 UTC OF 6<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA**



DATE/TIME IN UTC  
 IST = UTC + 0530 HRS  
 WML: WELL MARKED LOW  
 D: DEPRESSION  
 DD: DEEP DEPRESSION  
 CS: CYCLONIC STORM  
 — OBSERVED TRACK  
 — FORECAST TRACK  
 — CONE OF UNCERTAINTY

**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION BASED ON 0300 UTC OF 6<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA**



DATE/TIME IN UTC  
 IST = UTC + 0530 HRS  
 WML: WELL MARKED LOW  
 D: DEPRESSION  
 DD: DEEP DEPRESSION  
 CS: CYCLONIC STORM  
 — OBSERVED TRACK  
 — FORECAST TRACK

**AREA OF MAXIMUM SUSTAINED WIND:**

MSW(knot)/kmph)	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations

: 76-100

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH%**



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.11**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 06.12.2019**

**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.11 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0900UTC OF 06.12.2019 BASED ON 0600 UTC OF 06.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 10 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 0600 UTC OF 06<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.9°N AND LONGITUDE 52.6°E OVER SOUTHWEST ARABIAN SEA, ABOUT 540 KM SOUTH-SOUTHWEST OF SOCOTRA (41494) AND 530 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 12 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 24 HOURS AND CROSS SOMALIA COAST AS A DEEP DEPRESSION WITH MAXIMUM SUSTAINED WIND SPEED OF 55-65 KMPH GUSTING TO 75 KMPH CLOSE TO LATITUDE 07°N (AROUND GARACAD, MUDUG) DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

<b>DATE/ TIME(UTC)</b>	<b>POSITION (LAT. °N/ LONG. °E)</b>	<b>MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)</b>	<b>CATEGORY OF CYCLONIC DISTURBANCE</b>
06.12.19/0600	7.9/52.6	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/1200	7.5/51.6	60-70 GUSTING TO 80	CYCLONIC STORM
06.12.19/1800	7.2/50.6	60-70 GUSTING TO 80	CYCLONIC STORM
07.12.19/0000	6.9/49.6	55-65 GUSTING TO 75	DEEP DEPRESSION
07.12.19/0600	6.6/48.6	40-50 GUSTING TO 60	DEPRESSION
07.12.19/1800	6.0/46.5	35-45 GUSTING TO 55	DEPRESSION
08.12.19/0600	5.4/44.4	25-35 GUSTING TO 45	WELL MARKED LOW

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 0600 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 5.5°N TO 13.0°N AND LONG 50.5°E TO 56.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTHWEST THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  TO THE NORTHWEST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS INCREASED AND IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR DECREASED AND IS LOW (10-15 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS  $30-40 \text{ KJ/CM}^2$  OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN SLIGHTLY BEFORE CROSSING SOMALIA COAST, DUE TO LAND INTERACTION AND ALSO DUE TO LOW TCHP VALUES.

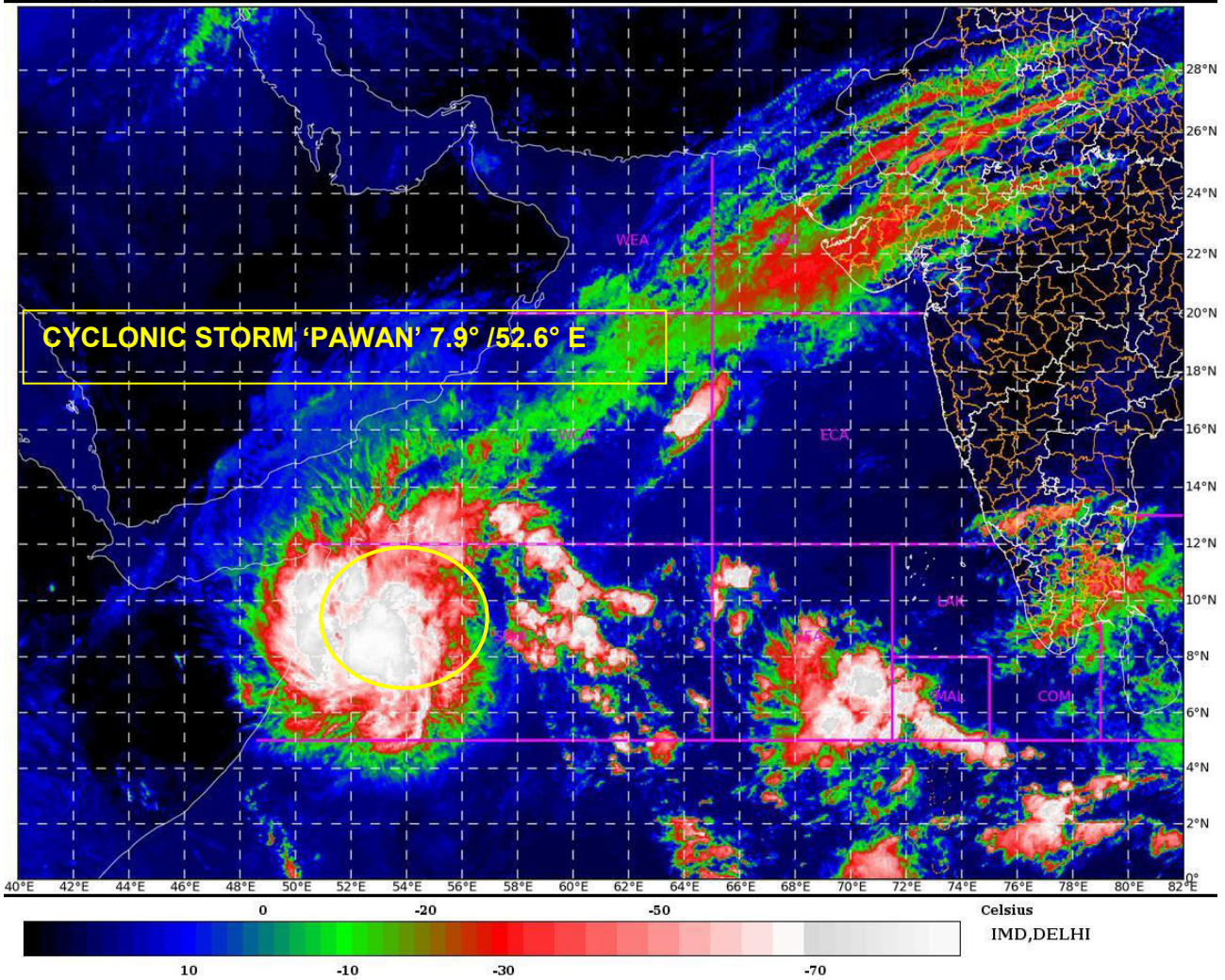
THE SYSTEM IS LIKELY TO MOVE WEST-SOUTHWESTWARDS UNDER THE INFLUENCE OF THE ANTICYCLONE TO THE WEST OF SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEEP DEPRESSION AROUND LATITUDE  $07^{\circ}\text{N}$  DURING 0000-0300 UTC OF  $07^{\text{TH}}$  DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

**(NEETHA K GOPAL)**  
**SCIENTIST-E, RSMC, NEW DELHI**

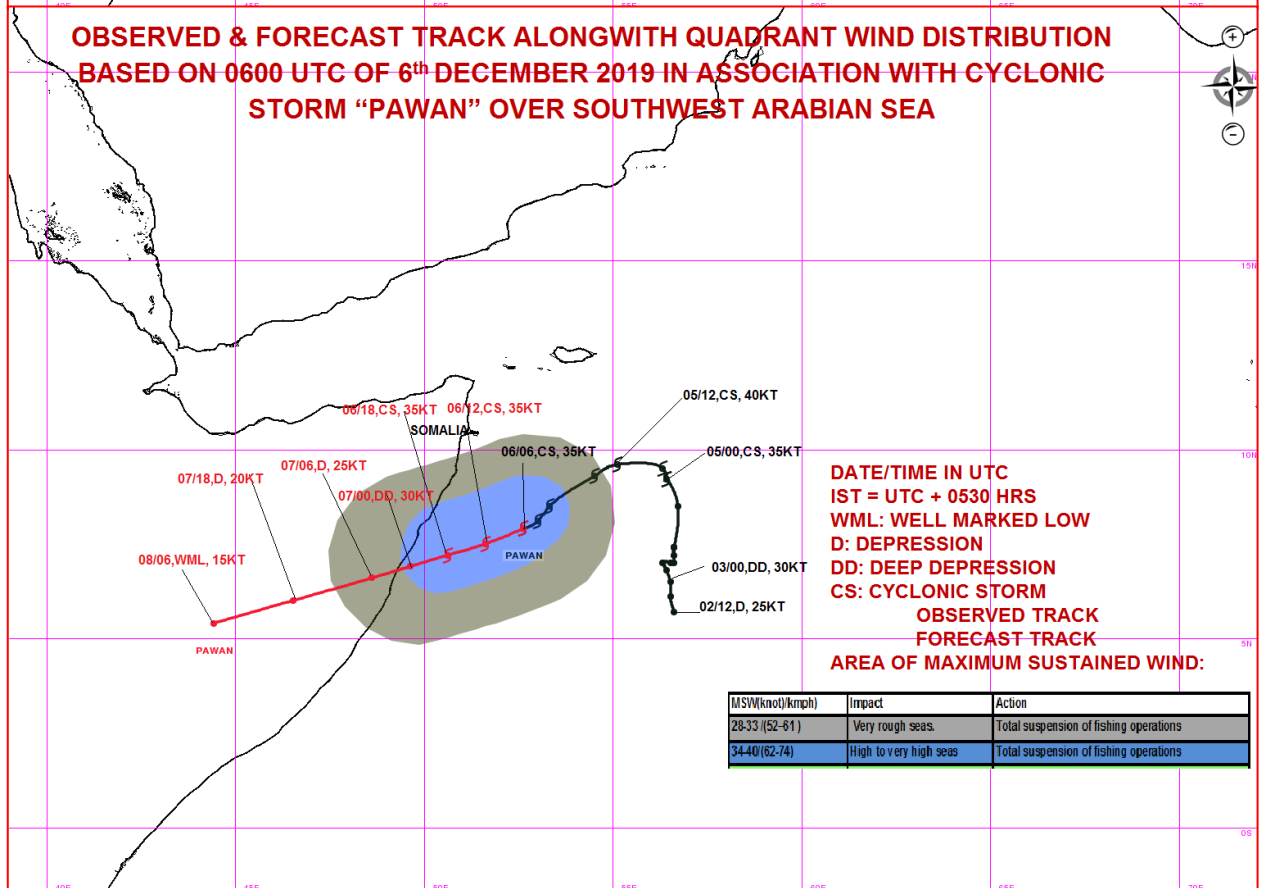
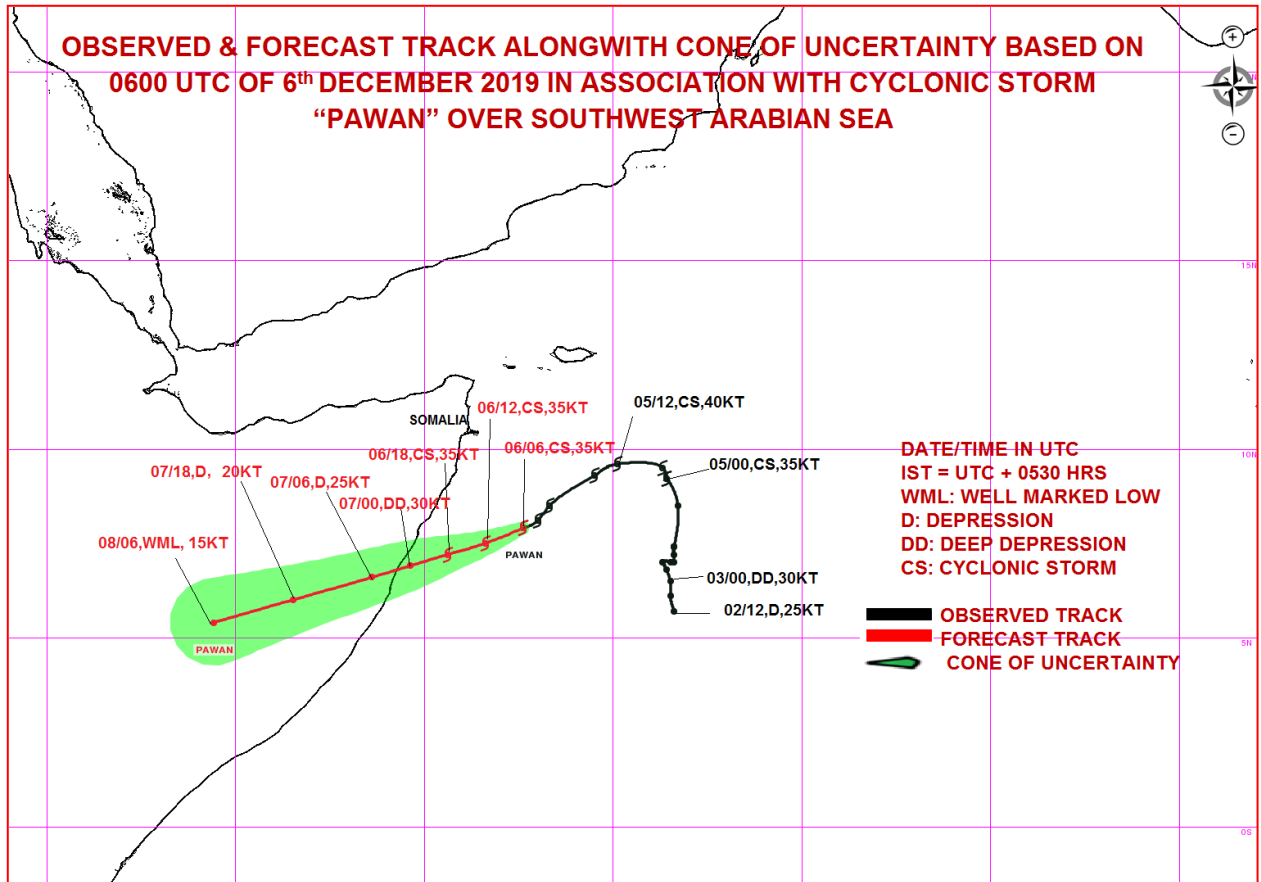
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN\_SEA

06-12-2019/(0800 to 0827) GMT  
06-12-2019/(1330 to 1357) IST



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVIORY BULLETIN NO.12**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 06.12.2019**

**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.12 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1130 UTC OF 06.12.2019 BASED ON 0900 UTC OF 06.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 08 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 0900 UTC OF 06<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.9°N AND LONGITUDE 52.6°E OVER SOUTHWEST ARABIAN SEA, ABOUT 540 KM SOUTH-SOUTHWEST OF SOCOTRA (41494) AND 530 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 12 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 24 HOURS AND CROSS SOMALIA COAST AS A DEEP DEPRESSION WITH MAXIMUM SUSTAINED WIND SPEED OF 55-65 KMPH GUSTING TO 75 KMPH CLOSE TO LATITUDE 07°N (AROUND GARACAD, MUDUG) DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.12.19/0900	7.9/52.6	65-75 GUSTING TO 85	CYCLONIC STORM
06.12.19/1200	7.7/52.1	65-75 GUSTING TO 85	CYCLONIC STORM
06.12.19/1800	7.3/50.8	60-70 GUSTING TO 80	CYCLONIC STORM
07.12.19/0000	6.9/49.6	55-65 GUSTING TO 75	DEEP DEPRESSION
07.12.19/0600	6.6/48.6	40-50 GUSTING TO 60	DEPRESSION
07.12.19/1800	6.0/46.5	35-45 GUSTING TO 55	DEPRESSION
08.12.19/0600	5.4/44.4	25-35 GUSTING TO 45	WELL MARKED LOW

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 0900 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 4.5°N TO 13.0°N AND LONG 49.0°E TO 56.5°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $5-10 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR DECREASED AND IS LOW (10-15 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS 30-40 KJ/CM<sup>2</sup> OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN SLIGHTLY BEFORE CROSSING SOMALIA COAST, DUE TO LAND INTERACTION AND ALSO DUE TO LOW TCHP VALUES.

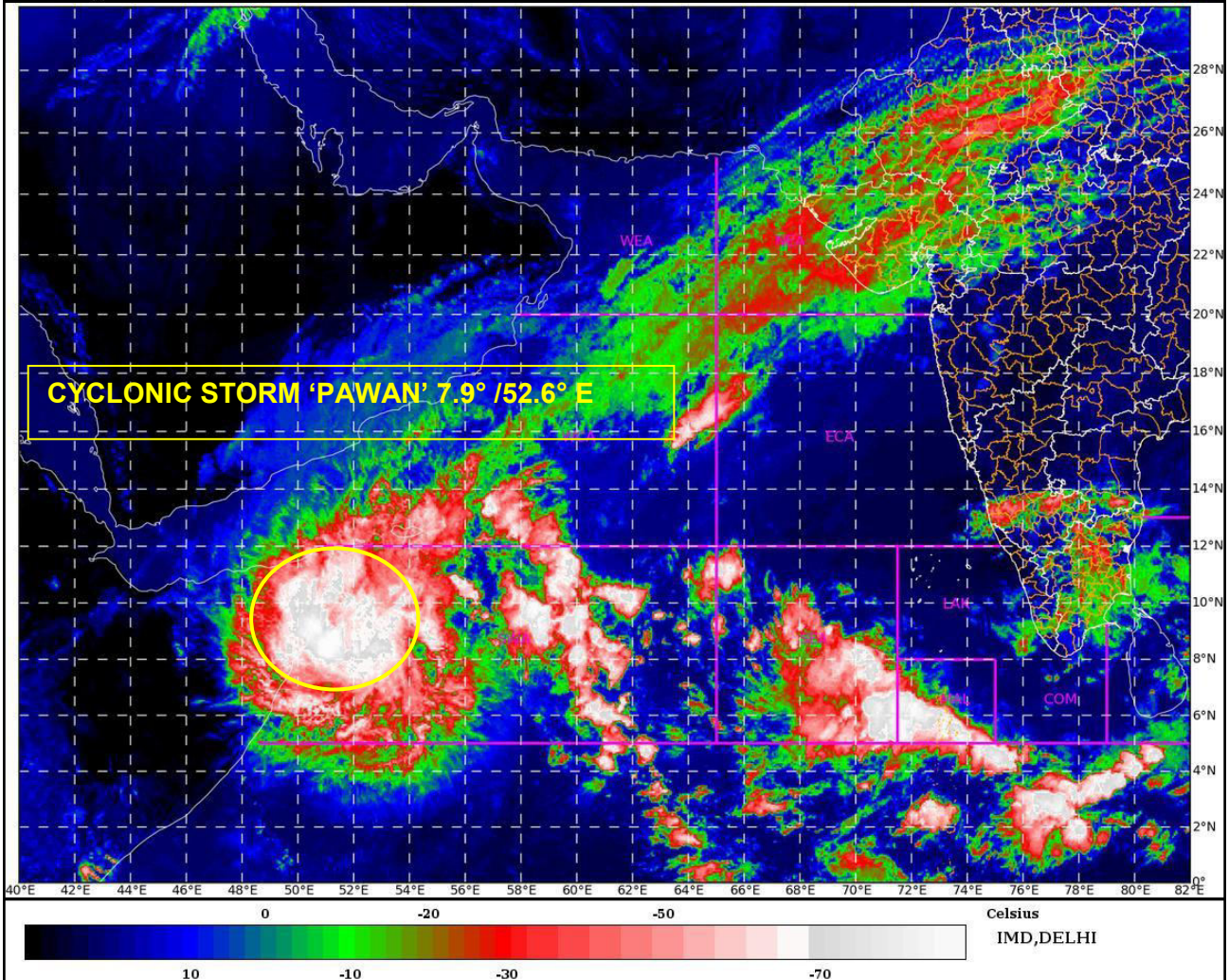
THE SYSTEM IS LIKELY TO MOVE WEST-SOUTHWESTWARDS UNDER THE INFLUENCE OF THE ANTICYCLONE TO THE WEST OF SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEEP DEPRESSION AROUND LATITUDE  $07^{\circ}\text{N}$  DURING 0000-0300 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

**(KRISHNA MISHRA)**  
**SCIENTIST-B, RSMC, NEW DELHI**

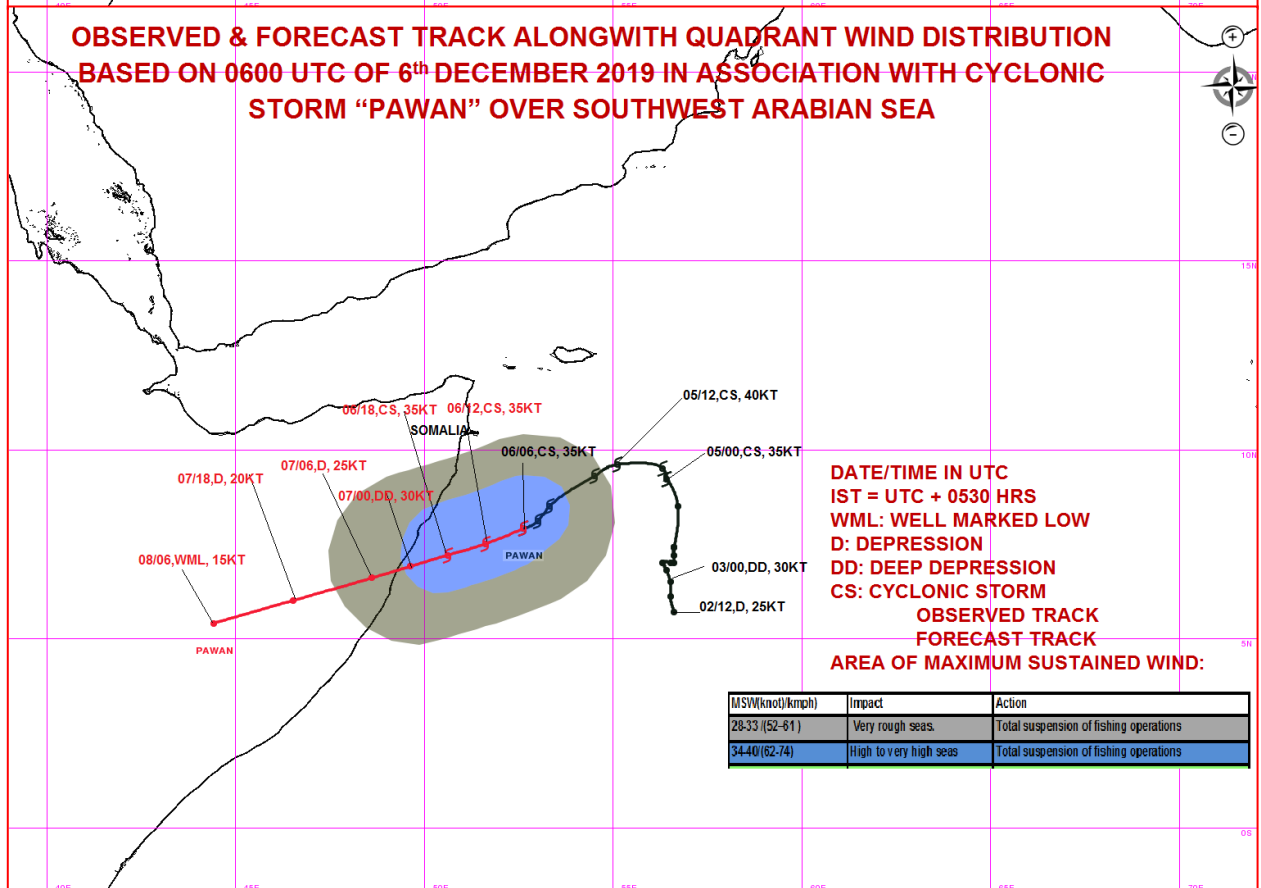
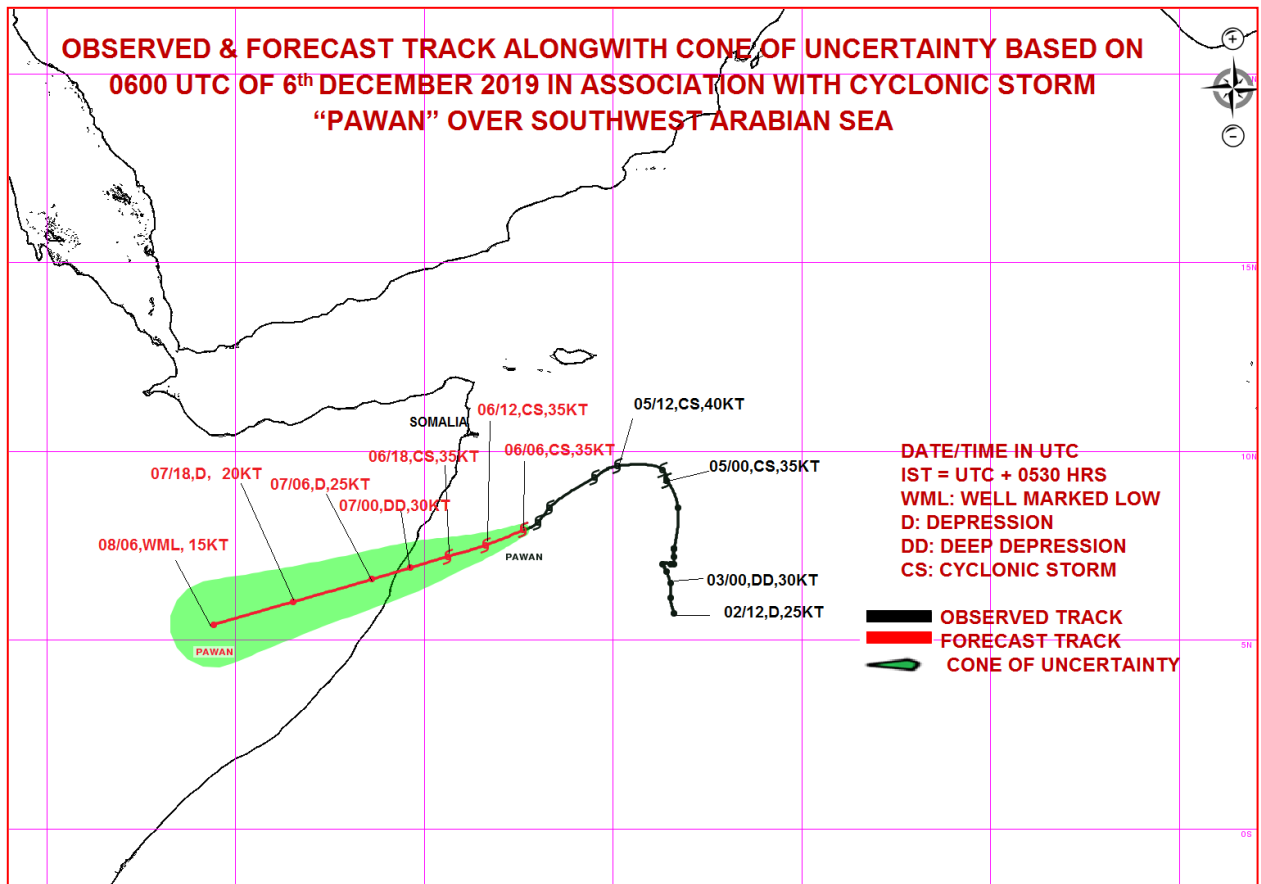
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN SEA

06-12-2019/(1030 to 1056) GMT  
06-12-2019/(1600 to 1626) IST



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVIORY BULLETIN NO.13**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 06.12.2019**

**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.13 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1500 UTC OF 06.12.2019 BASED ON 1200 UTC OF 06.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WESTWARDS WITH A SPEED OF 06 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 1200 UTC OF 06<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.9°N AND LONGITUDE 52.3°E OVER SOUTHWEST ARABIAN SEA, ABOUT 550 KM SOUTH-SOUTHWEST OF SOCOTRA (41494) AND 510 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 12 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 24 HOURS AND CROSS SOMALIA COAST AS A DEEP DEPRESSION WITH MAXIMUM SUSTAINED WIND SPEED OF 55-65 KMPH GUSTING TO 75 KMPH CLOSE TO LATITUDE 07°N (AROUND GARACAD, MUDUG) DURING 0400-0700 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.12.19/1200	7.9/52.3	65-75 GUSTING TO 85	CYCLONIC STORM
06.12.19/1800	7.4/51.1	65-75 GUSTING TO 85	CYCLONIC STORM
07.12.19/0000	7.0/50.0	60-70 GUSTING TO 80	CYCLONIC STORM
07.12.19/0600	6.6/49.0	55-65 GUSTING TO 75	DEEP DEPRESSION
07.12.19/1200	6.1/47.7	40-50 GUSTING TO 60	DEPRESSION
08.12.19/0000	5.5/45.6	25-35 GUSTING TO 45	WELL MARKED LOW

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 1200 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 4.5°N TO 13.0°N AND LONG 49.0°E TO 56.5°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE. A SHIP LOCATED AT 10.5°N/54.6°E REPORTED WIND OF 70°/27KNOTS.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $5-10 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND NOW IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS  $30-40 \text{ KJ/CM}^2$  OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN SLIGHTLY BEFORE CROSSING SOMALIA COAST, DUE TO LAND INTERACTION AND ALSO DUE TO LOW TCHP VALUES.

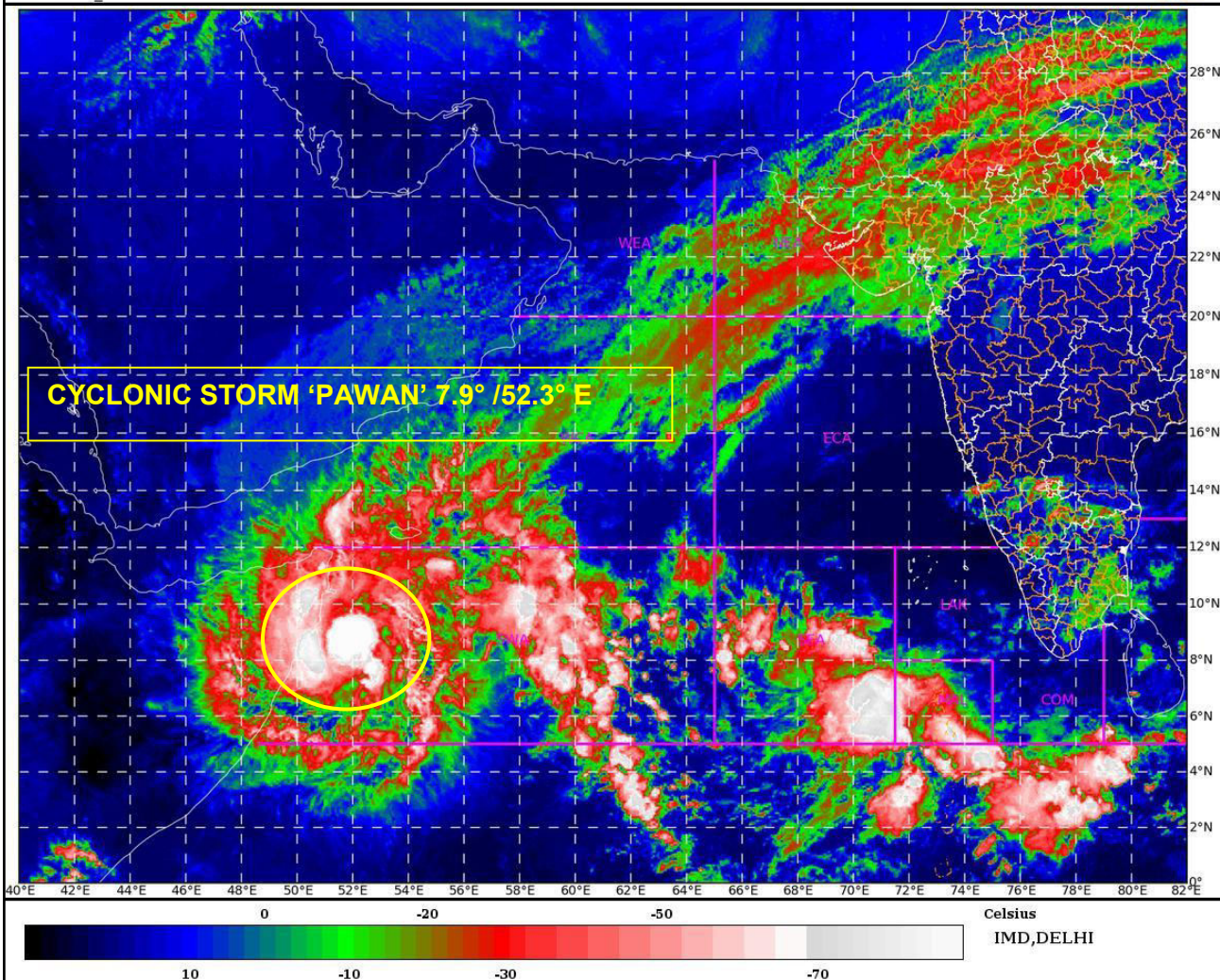
THE SYSTEM IS LIKELY TO MOVE WEST-SOUTHWESTWARDS UNDER THE INFLUENCE OF THE ANTICYCLONE TO THE WEST OF SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEEP DEPRESSION AROUND LATITUDE  $07^{\circ}\text{N}$  DURING 0400-0700 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

**(SUNITHA DEVI S)**  
**SCIENTIST-E, RSMC, NEW DELHI**

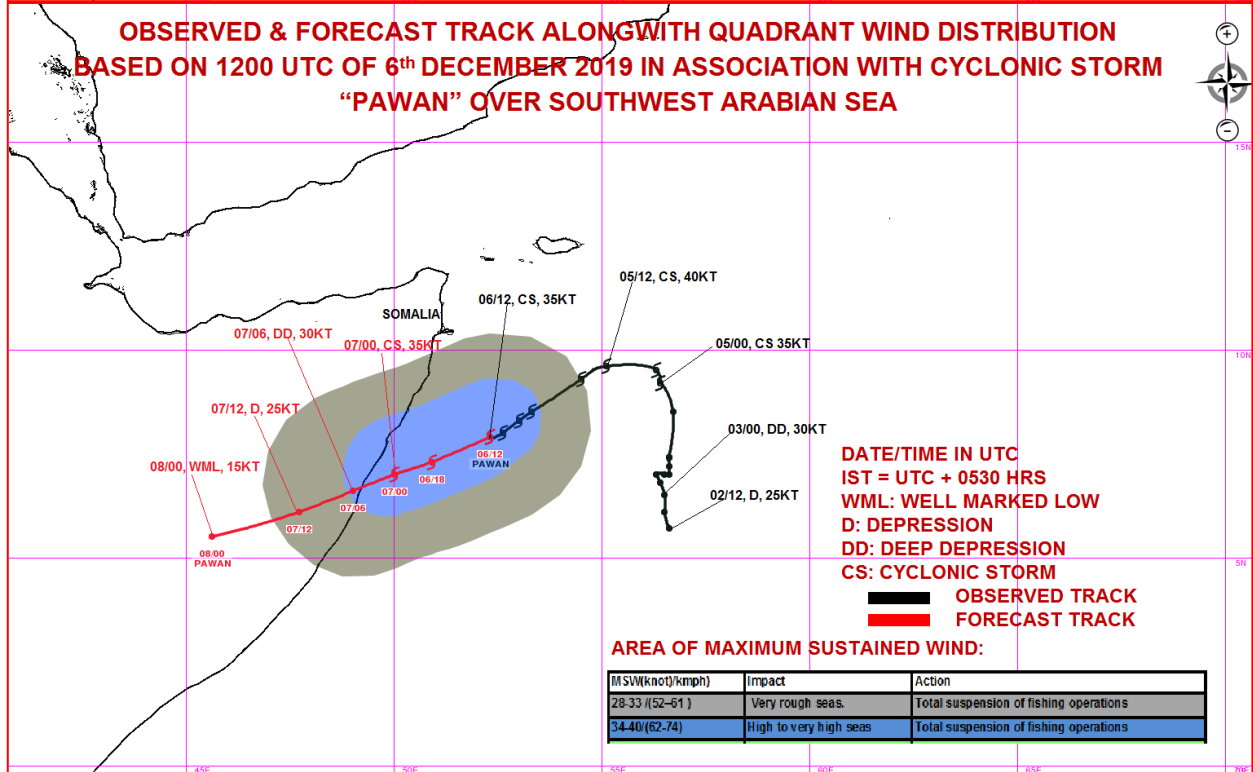
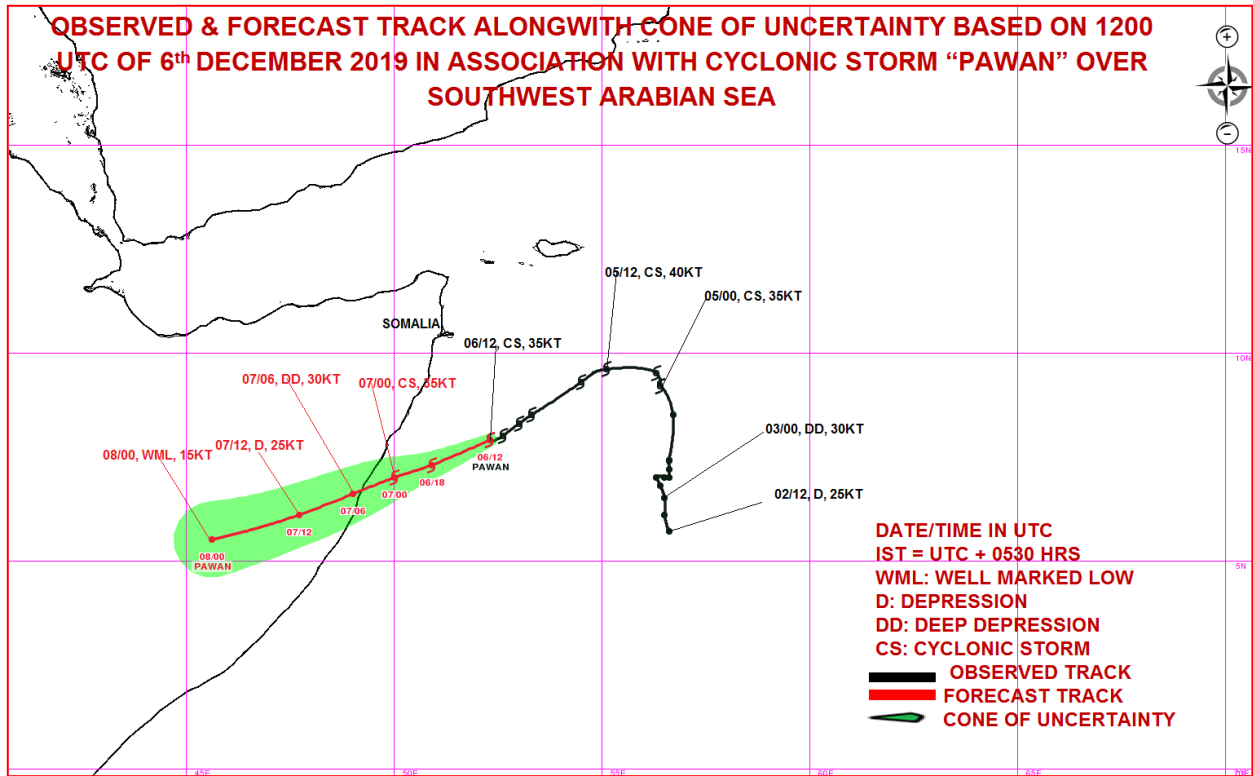
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN SEA

06-12-2019/(1330 to 1356) GMT  
06-12-2019/(1900 to 1926) IST



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVIORY BULLETIN NO.14**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 06.12.2019**

**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.14 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1630 UTC OF 06.12.2019 BASED ON 1500 UTC OF 06.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 15 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 1500 UTC OF 06<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.7°N AND LONGITUDE 51.8°E OVER SOUTHWEST ARABIAN SEA, ABOUT 590 KM SOUTH-SOUTHWEST OF SOCOTRA (41494) AND 490 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 12 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 24 HOURS AND CROSS SOMALIA COAST AS A DEEP DEPRESSION WITH MAXIMUM SUSTAINED WIND SPEED OF 55-65 KMPH GUSTING TO 75 KMPH CLOSE TO LATITUDE 07°N (AROUND GARACAD, MUDUG) DURING 0400-0700 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

<b>DATE/ TIME(UTC)</b>	<b>POSITION (LAT. °N/ LONG. °E)</b>	<b>MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)</b>	<b>CATEGORY OF CYCLONIC DISTURBANCE</b>
06.12.19/1500	7.7/51.8	65-75 GUSTING TO 85	CYCLONIC STORM
06.12.19/1800	7.4/51.1	65-75 GUSTING TO 85	CYCLONIC STORM
07.12.19/0000	7.0/50.0	60-70 GUSTING TO 80	CYCLONIC STORM
07.12.19/0600	6.6/49.0	55-65 GUSTING TO 75	DEEP DEPRESSION
07.12.19/1200	6.1/47.7	40-50 GUSTING TO 60	DEPRESSION
08.12.19/0000	5.5/45.6	25-35 GUSTING TO 45	WELL MARKED LOW

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 1500 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 7.0°N TO 10.0°N AND LONG 50.0°E TO 53.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE. A SHIP LOCATED AT 10.5°N/54.6°E REPORTED WIND OF 70°/27KNOTS.

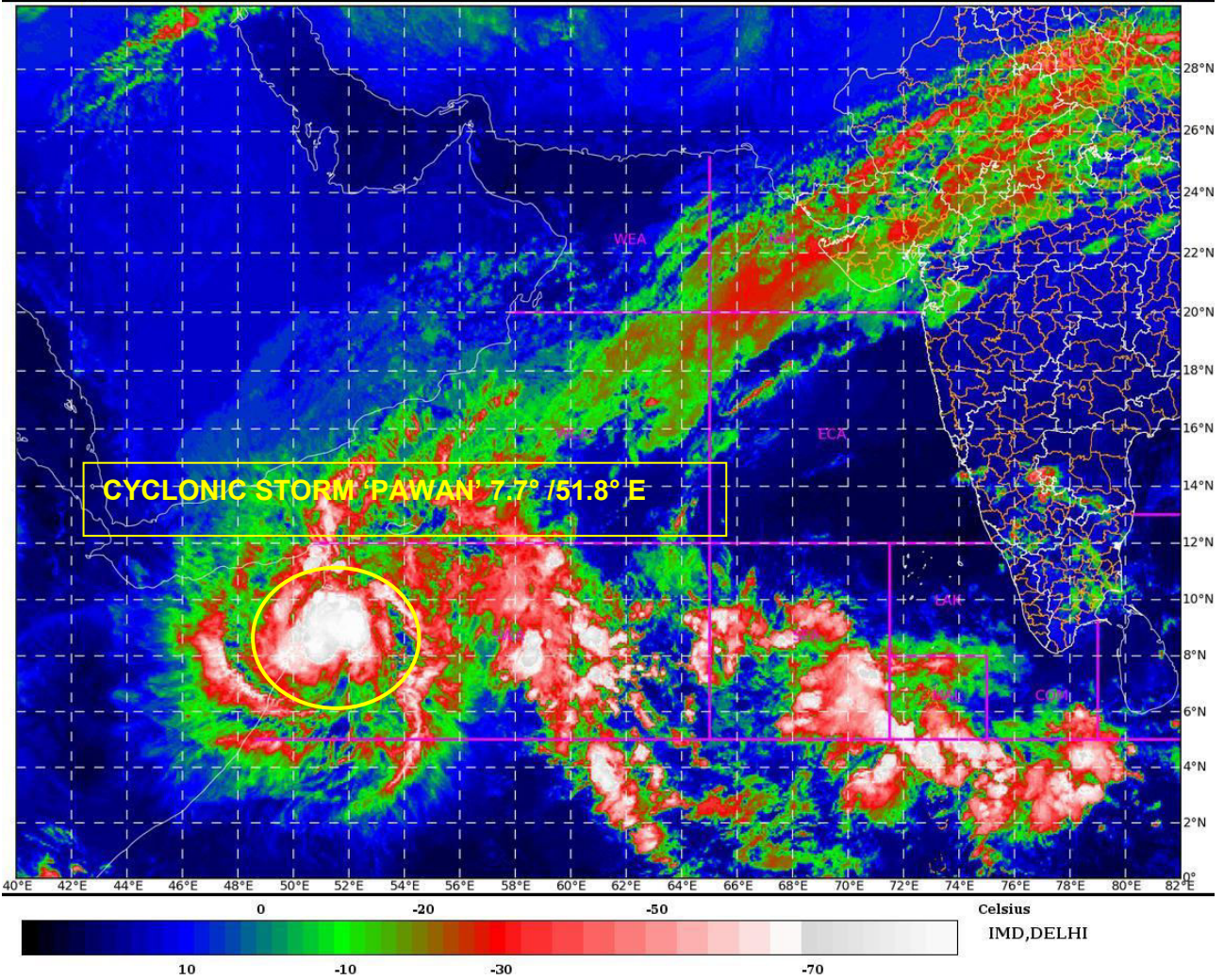
THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $5-10 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND NOW IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^\circ \text{ N}$ . SEA SURFACE TEMPERATURE IS ABOUT  $26-27^\circ \text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS  $30-40 \text{ KJ/CM}^2$  OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN SLIGHTLY BEFORE CROSSING SOMALIA COAST, DUE TO LAND INTERACTION AND ALSO DUE TO LOW TCHP VALUES.

THE SYSTEM IS LIKELY TO MOVE WEST-SOUTHWESTWARDS UNDER THE INFLUENCE OF THE ANTICYCLONE TO THE WEST OF SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEEP DEPRESSION AROUND LATITUDE  $07^\circ \text{N}$  DURING 0400-0700 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

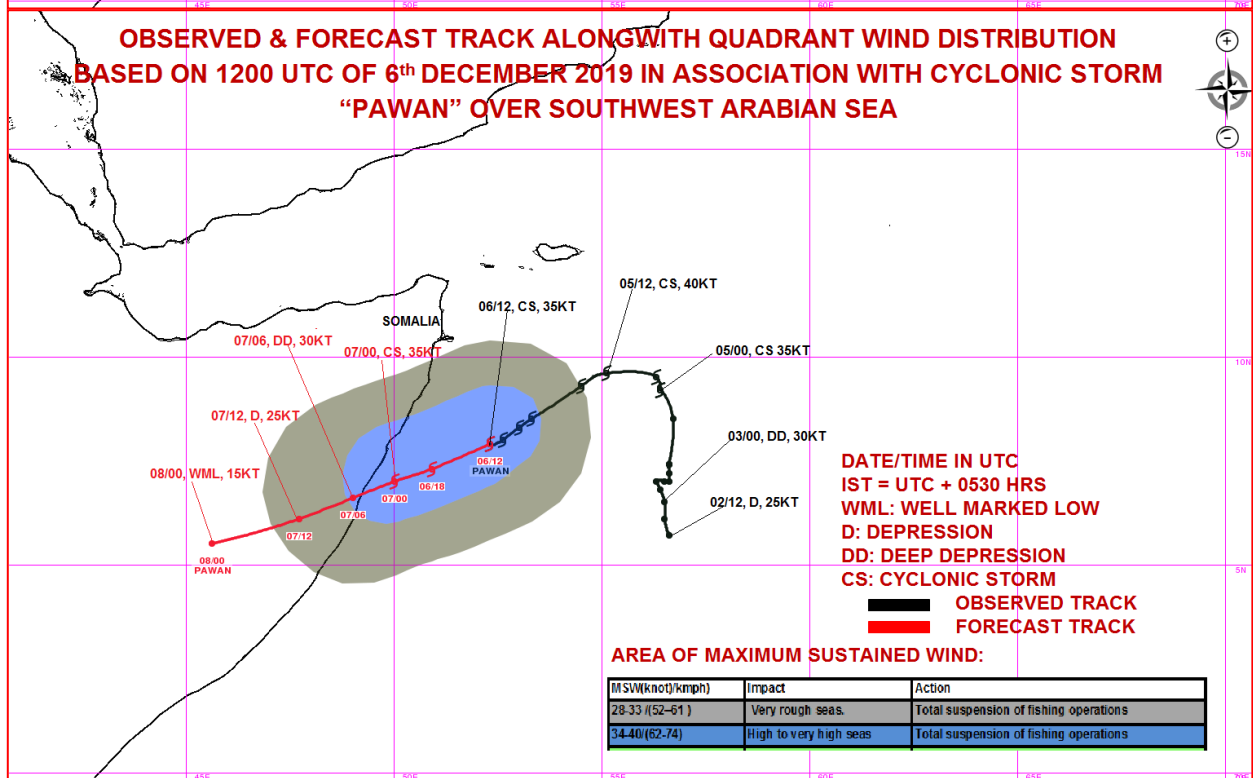
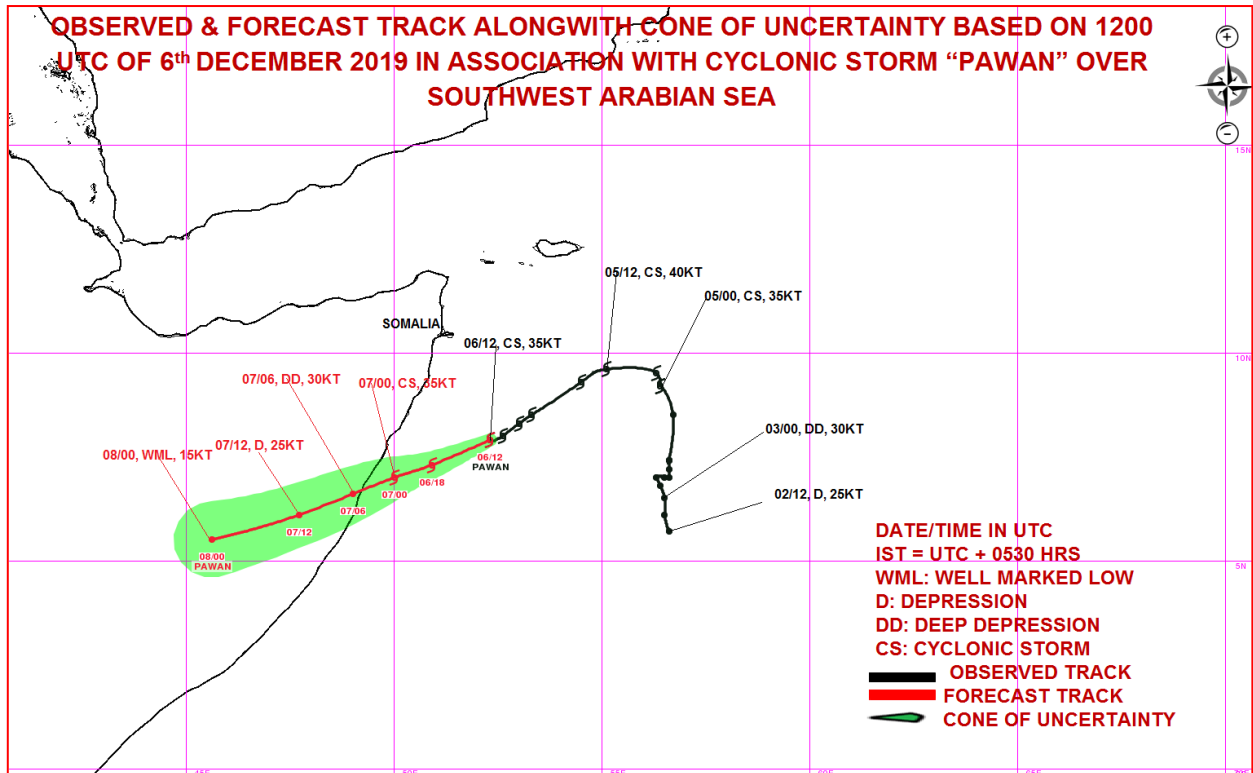
**(V.R DURAI)**  
**SCIENTIST-E, RSMC, NEW DELHI**

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVIORY BULLETIN NO.14**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 06.12.2019**

**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.14 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 1630 UTC OF 06.12.2019 BASED ON 1500 UTC OF 06.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 15 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 1500 UTC OF 06<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.7°N AND LONGITUDE 51.8°E OVER SOUTHWEST ARABIAN SEA, ABOUT 590 KM SOUTH-SOUTHWEST OF SOCOTRA (41494) AND 490 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 12 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 24 HOURS AND CROSS SOMALIA COAST AS A DEEP DEPRESSION WITH MAXIMUM SUSTAINED WIND SPEED OF 55-65 KMPH GUSTING TO 75 KMPH CLOSE TO LATITUDE 07°N (AROUND GARACAD, MUDUG) DURING 0400-0700 UTC OF 07TH DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

<b>DATE/ TIME(UTC)</b>	<b>POSITION (LAT. °N/ LONG. °E)</b>	<b>MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)</b>	<b>CATEGORY OF CYCLONIC DISTURBANCE</b>
06.12.19/1500	7.7/51.8	65-75 GUSTING TO 85	CYCLONIC STORM
06.12.19/1800	7.4/51.1	65-75 GUSTING TO 85	CYCLONIC STORM
07.12.19/0000	7.0/50.0	60-70 GUSTING TO 80	CYCLONIC STORM
07.12.19/0600	6.6/49.0	55-65 GUSTING TO 75	DEEP DEPRESSION
07.12.19/1200	6.1/47.7	40-50 GUSTING TO 60	DEPRESSION
08.12.19/0000	5.5/45.6	25-35 GUSTING TO 45	WELL MARKED LOW

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 1500 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA BETWEEN LAT 7.0°N TO 10.0°N AND LONG 50.0°E TO 53.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE. A SHIP LOCATED AT 10.5°N/54.6°E REPORTED WIND OF 70°/27KNOTS.

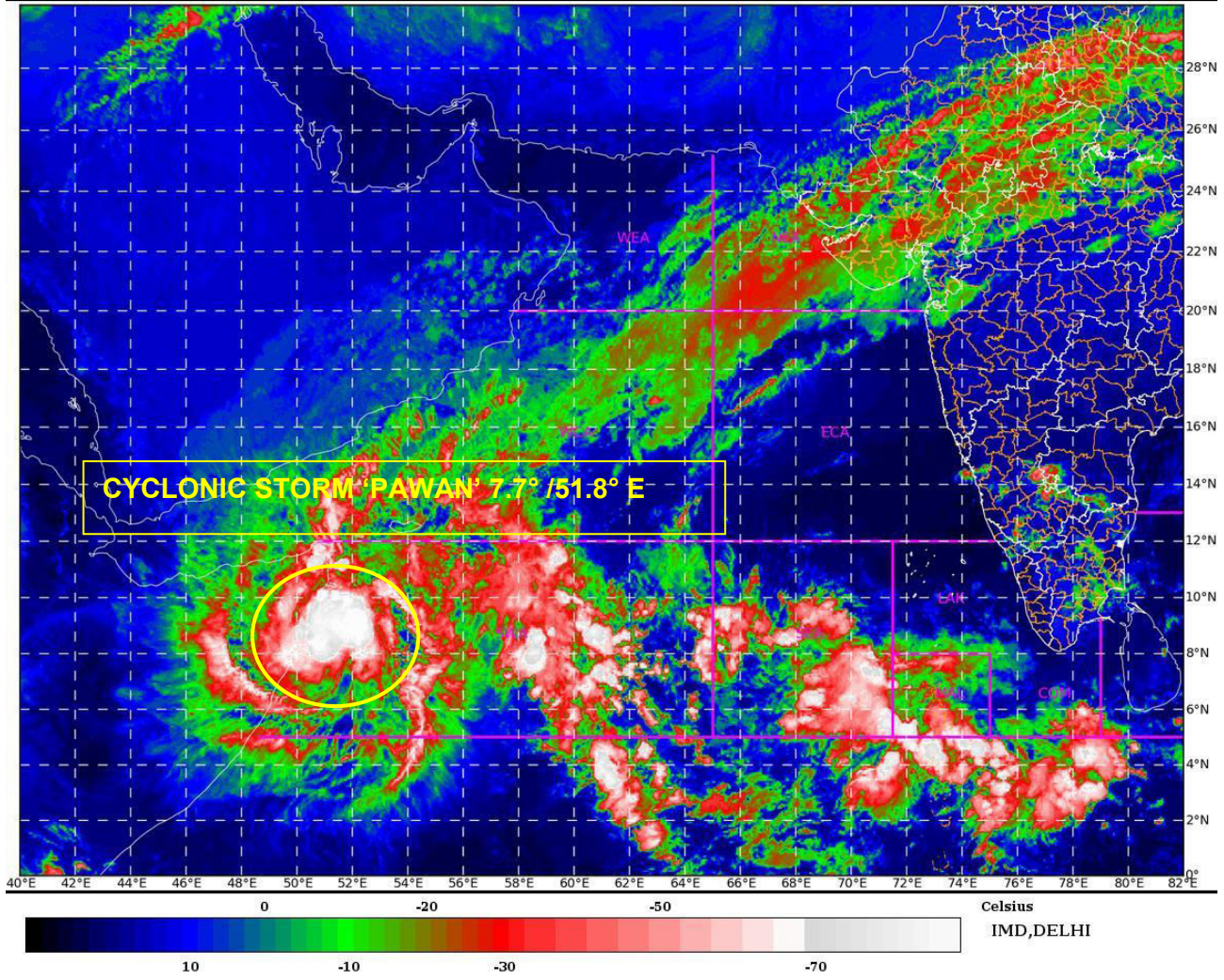
THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $5-10 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND NOW IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS  $30-40 \text{ KJ/CM}^2$  OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN SLIGHTLY BEFORE CROSSING SOMALIA COAST, DUE TO LAND INTERACTION AND ALSO DUE TO LOW TCHP VALUES.

THE SYSTEM IS LIKELY TO MOVE WEST-SOUTHWESTWARDS UNDER THE INFLUENCE OF THE ANTICYCLONE TO THE WEST OF SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEEP DEPRESSION AROUND LATITUDE  $07^{\circ}\text{N}$  DURING 0400-0700 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

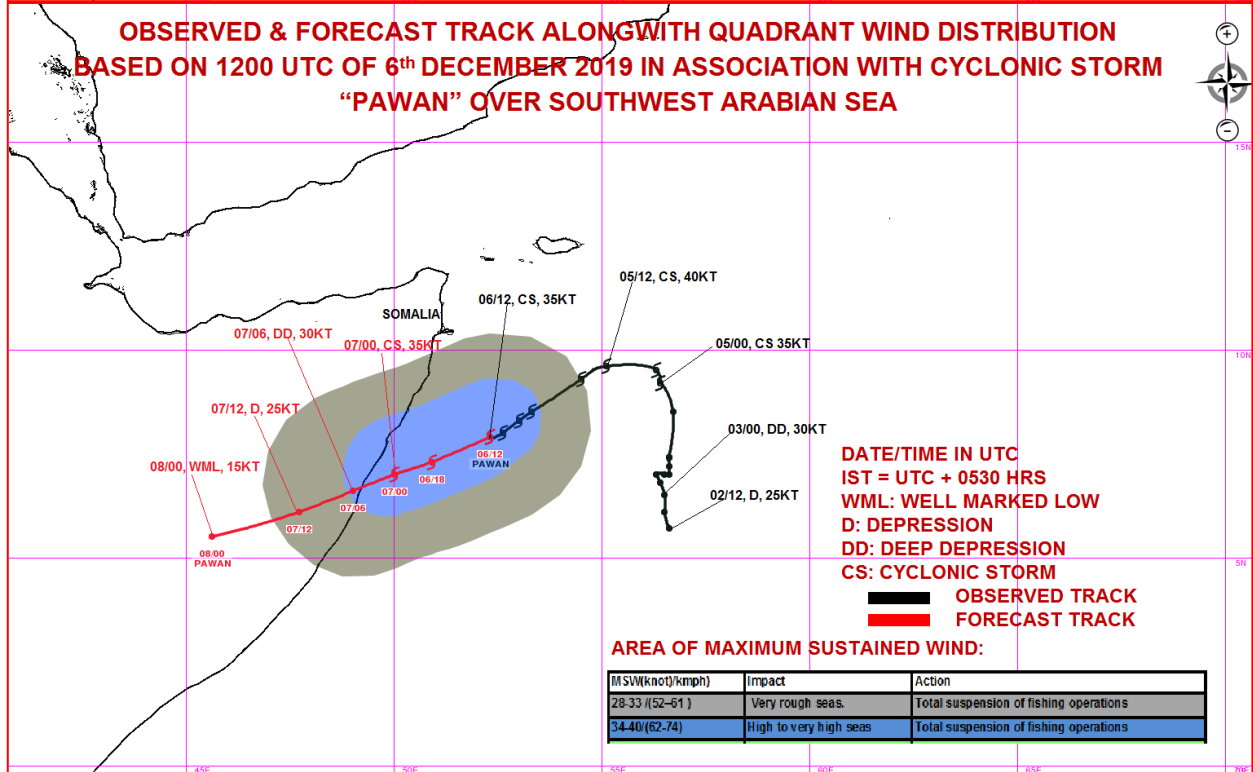
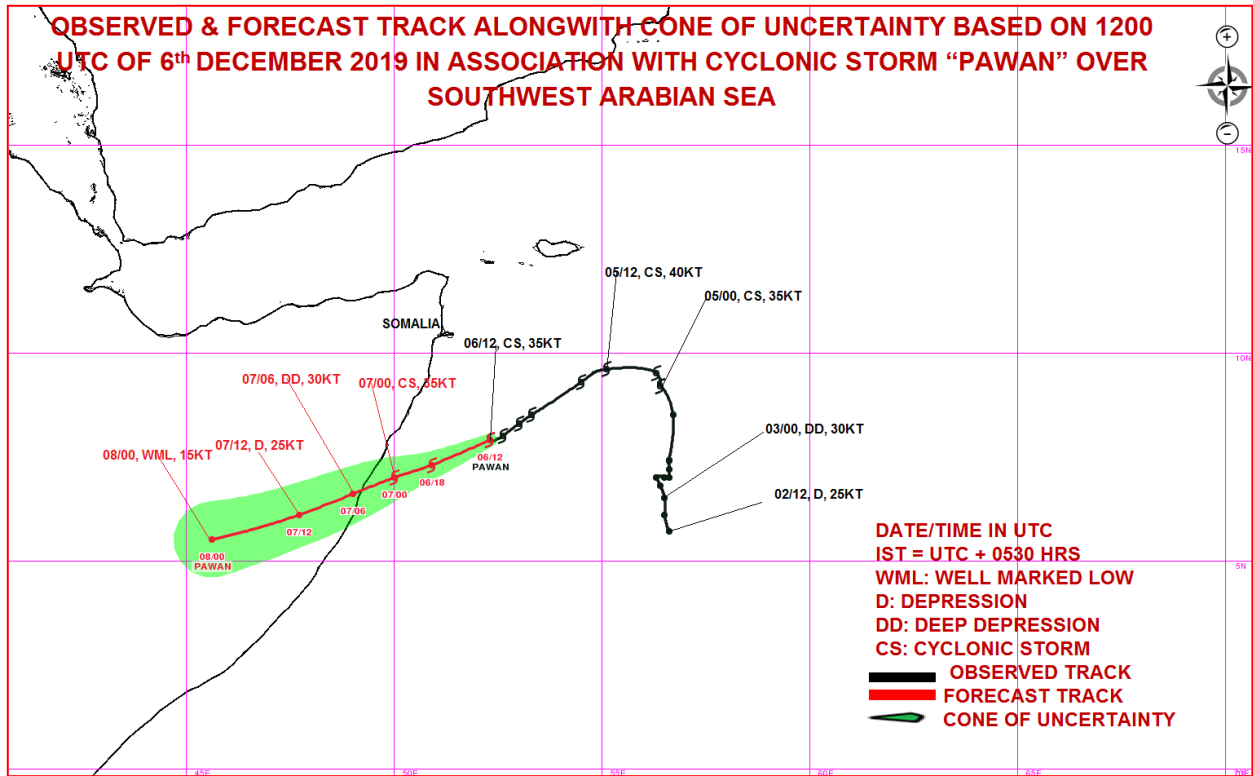
**(V.R DURAI)**  
**SCIENTIST-E, RSMC, NEW DELHI**

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVIORY BULLETIN NO.15**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 06.12.2019**

**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.15 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 2030 UTC OF 06.12.2019 BASED ON 1800 UTC OF 06.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 20 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 1800 UTC OF 06<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.5°N AND LONGITUDE 51.3°E OVER SOUTHWEST ARABIAN SEA, ABOUT 640 KM SOUTH-SOUTHWEST OF SOCOTRA (41494) AND 480 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 06 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 24 HOURS AND CROSS SOMALIA COAST AS A DEEP DEPRESSION WITH MAXIMUM SUSTAINED WIND SPEED OF 55-65 KMPH GUSTING TO 75 KMPH CLOSE TO LATITUDE 07°N (AROUND GARACAD, MUDUG) DURING 0400-0700 UTC OF 07<sup>TH</sup> DECEMBER.**

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

<b>DATE/ TIME(UTC)</b>	<b>POSITION (LAT. °N/ LONG. °E)</b>	<b>MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)</b>	<b>CATEGORY OF CYCLONIC DISTURBANCE</b>
06.12.19/1800	7.5/51.3	65-75 GUSTING TO 85	CYCLONIC STORM
07.12.19/0000	7.0/50.1	60-70 GUSTING TO 80	CYCLONIC STORM
07.12.19/0600	6.6/49.0	55-65 GUSTING TO 75	DEEP DEPRESSION
07.12.19/1200	6.1/47.7	40-50 GUSTING TO 60	DEPRESSION
07.12.19/1800	5.8/46.7	25-35 GUSTING TO 45	WELL MARKED LOW

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 1800 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA and ADJOINING COASTAL SOMALIA BETWEEN LAT 7.5°N TO 11.0°N AND LONG 50.0°E TO 52.5°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

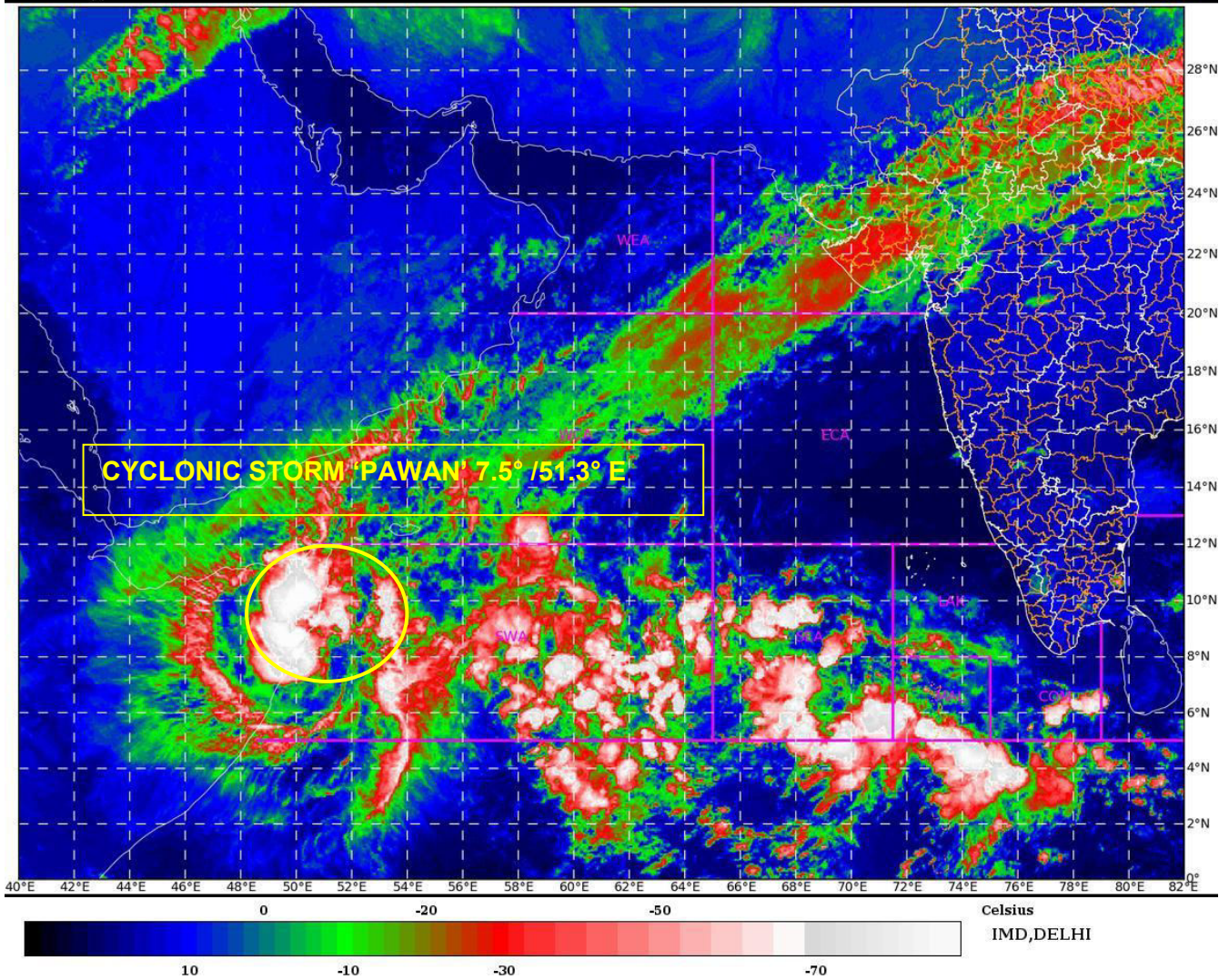
THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $5-10 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND NOW IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE (10-20 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS  $30-40 \text{ KJ/CM}^2$  OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN SLIGHTLY BEFORE CROSSING SOMALIA COAST, DUE TO LAND INTERACTION AND ALSO DUE TO LOW TCHP VALUES.

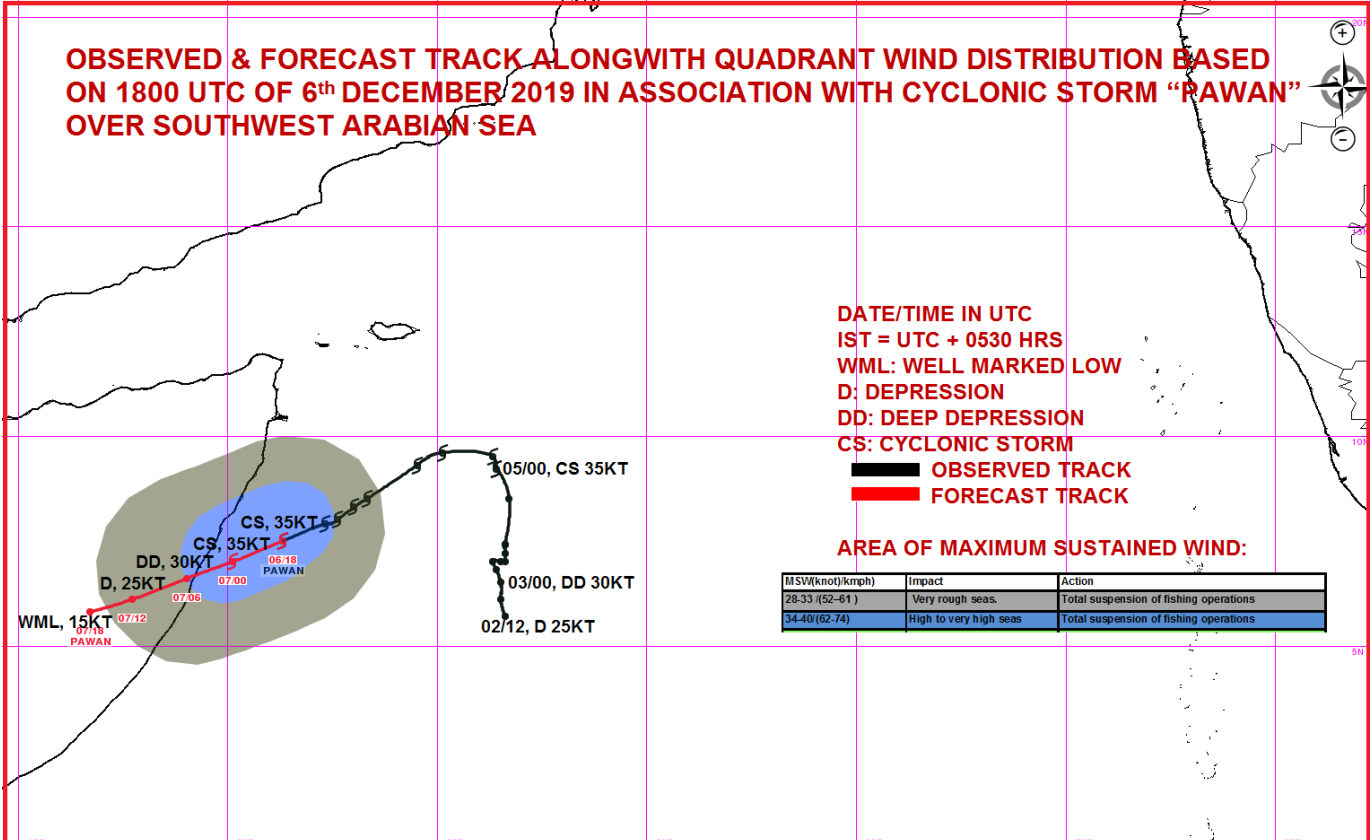
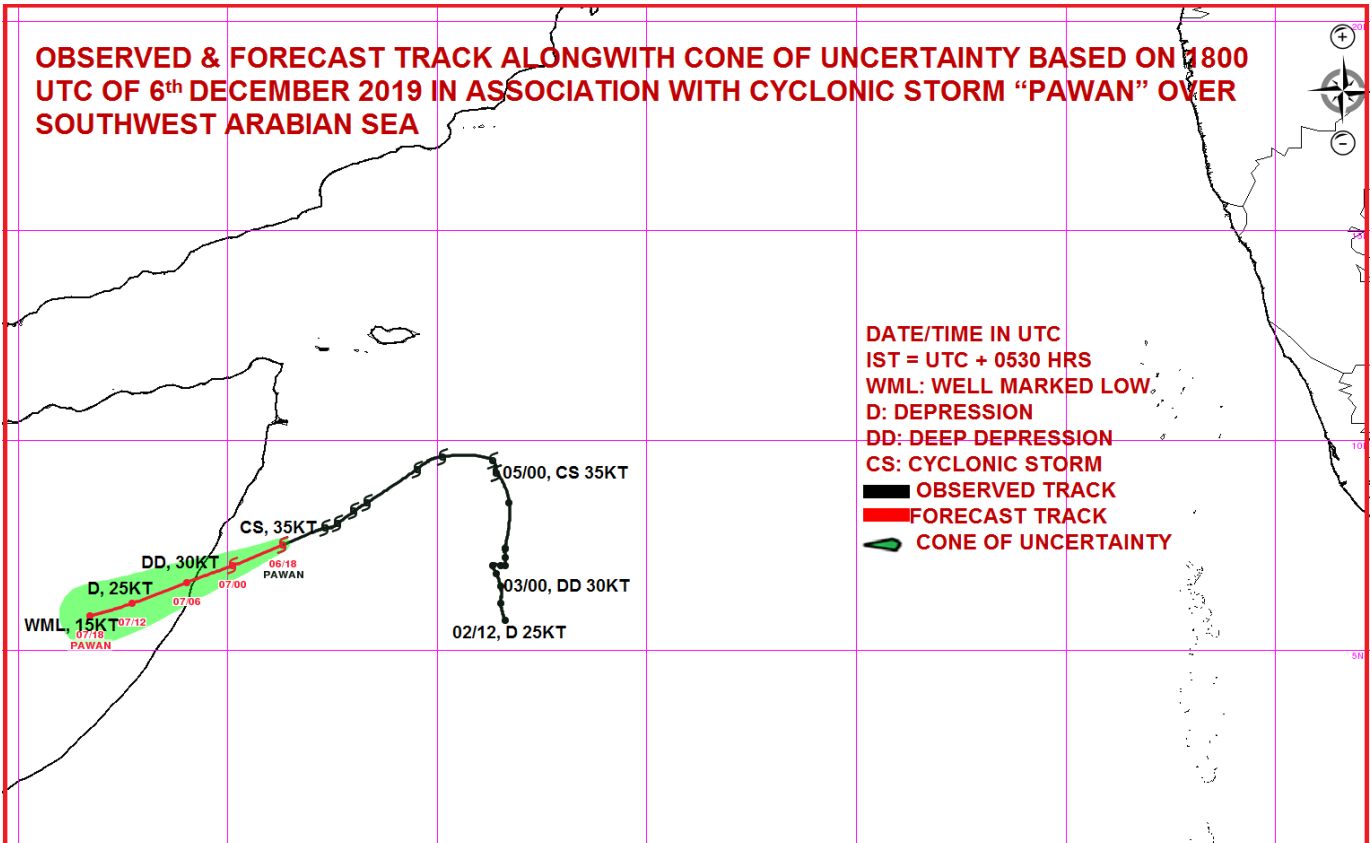
THE SYSTEM IS LIKELY TO MOVE WEST-SOUTHWESTWARDS UNDER THE INFLUENCE OF THE ANTICYCLONE TO THE WEST OF SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEEP DEPRESSION AROUND LATITUDE  $07^{\circ}\text{N}$  DURING 0400-0700 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

**(V.R DURAI)**  
**SCIENTIST-E, RSMC, NEW DELHI**

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVIORY BULLETIN NO.16**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 07.12.2019**

**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 ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0000 UTC OF 07.12.2019 BASED ON 2100 UTC OF 06.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 16 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 2100 UTC OF 06<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.5°N AND LONGITUDE 50.9°E OVER SOUTHWEST ARABIAN SEA, ABOUT 660 KM SOUTH-SOUTHWEST OF SOCOTRA (41494) AND 460 KM SOUTHEAST OF BOSASO (63210). IT IS VERY LIKELY TO MAINTAIN ITS INTENSITY AS A CYCLONIC STORM DURING NEXT 06 HOURS AND WEAKEN GRADUALLY THEREAFTER. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS DURING NEXT 24 HOURS AND CROSS SOMALIA COAST AS A DEEP DEPRESSION WITH MAXIMUM SUSTAINED WIND SPEED OF 55-65 KMPH GUSTING TO 75 KMPH CLOSE TO LATITUDE 07°N (AROUND GARACAD, MUDUG) DURING 0400-0700 UTC OF 07<sup>TH</sup> DECEMBER.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME(UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
06.12.19/2100	7.5/50.9	65-75 GUSTING TO 85	CYCLONIC STORM
07.12.19/0000	7.0/50.1	60-70 GUSTING TO 80	CYCLONIC STORM
07.12.19/0600	6.6/49.0	55-65 GUSTING TO 75	DEEP DEPRESSION
07.12.19/1200	6.1/47.7	40-50 GUSTING TO 60	DEPRESSION
07.12.19/1800	5.8/46.7	25-35 GUSTING TO 45	WELL MARKED LOW

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 2100 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA and ADJOINING COASTAL SOMALIA BETWEEN LAT 7.0°N TO 10.0°N AND LONG 49.5°E TO 52.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

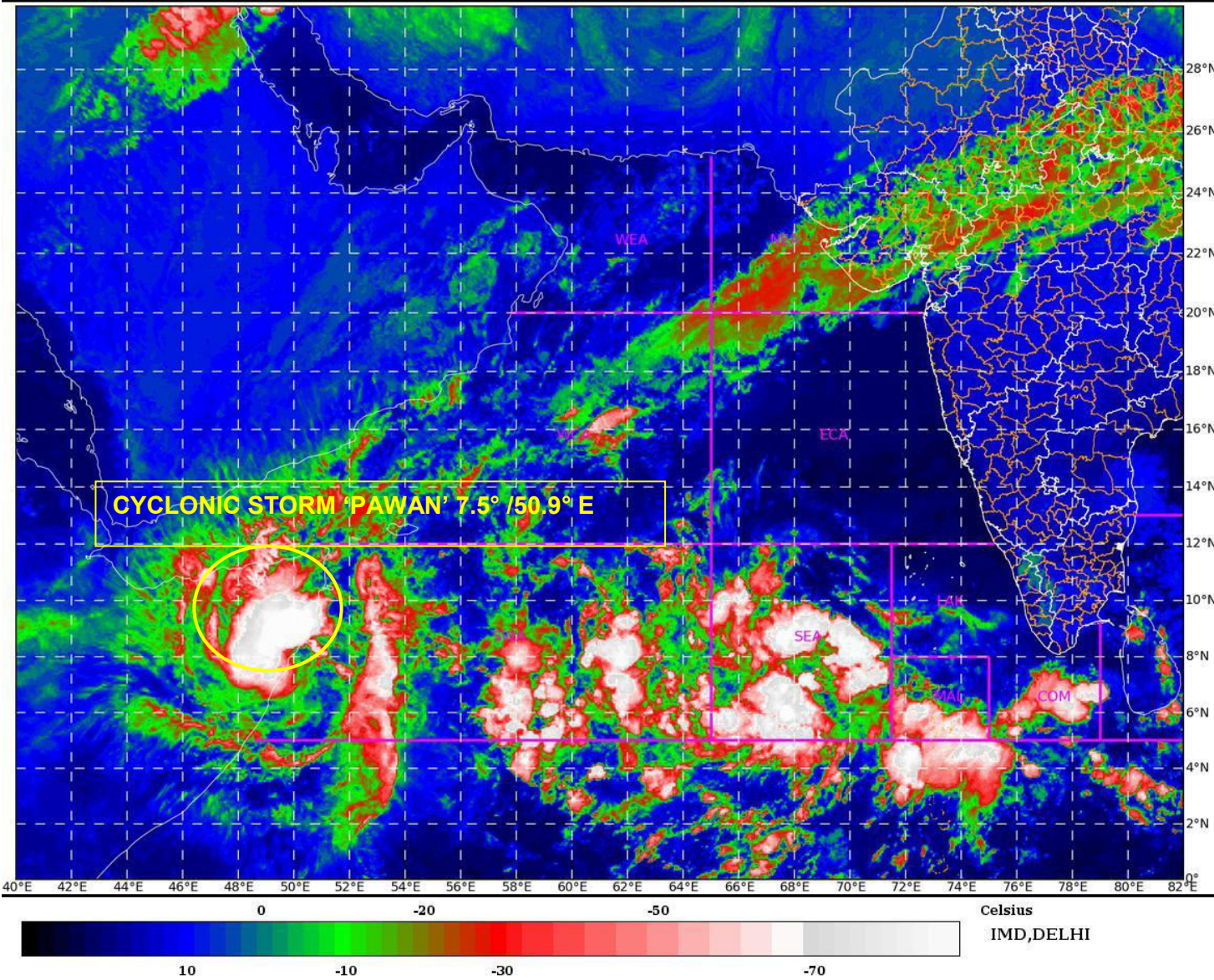
THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, TOTAL PRECIPITABLE WATER VAPOUR IMAGERIES INDICATE WARM AIR ADVECTION TO THE SYSTEM CENTRE. THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $5-10 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS DECREASED AND NOW IS ABOUT  $10 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE (05-10 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS  $30-40 \text{ KJ/CM}^2$  OVER THE REGION. AS SYSTEM IS LYING OVER A MODERATLY FAVOURABLE ENVIRONMENTAL CONDITIONS, IT IS LIKELY TO MAINTAIN THE INTENSITY OF A CYCLONIC STORM FOR NEXT 12 HOURS AND WEAKEN SLIGHTLY BEFORE CROSSING SOMALIA COAST, DUE TO LAND INTERACTION AND ALSO DUE TO LOW TCHP VALUES.

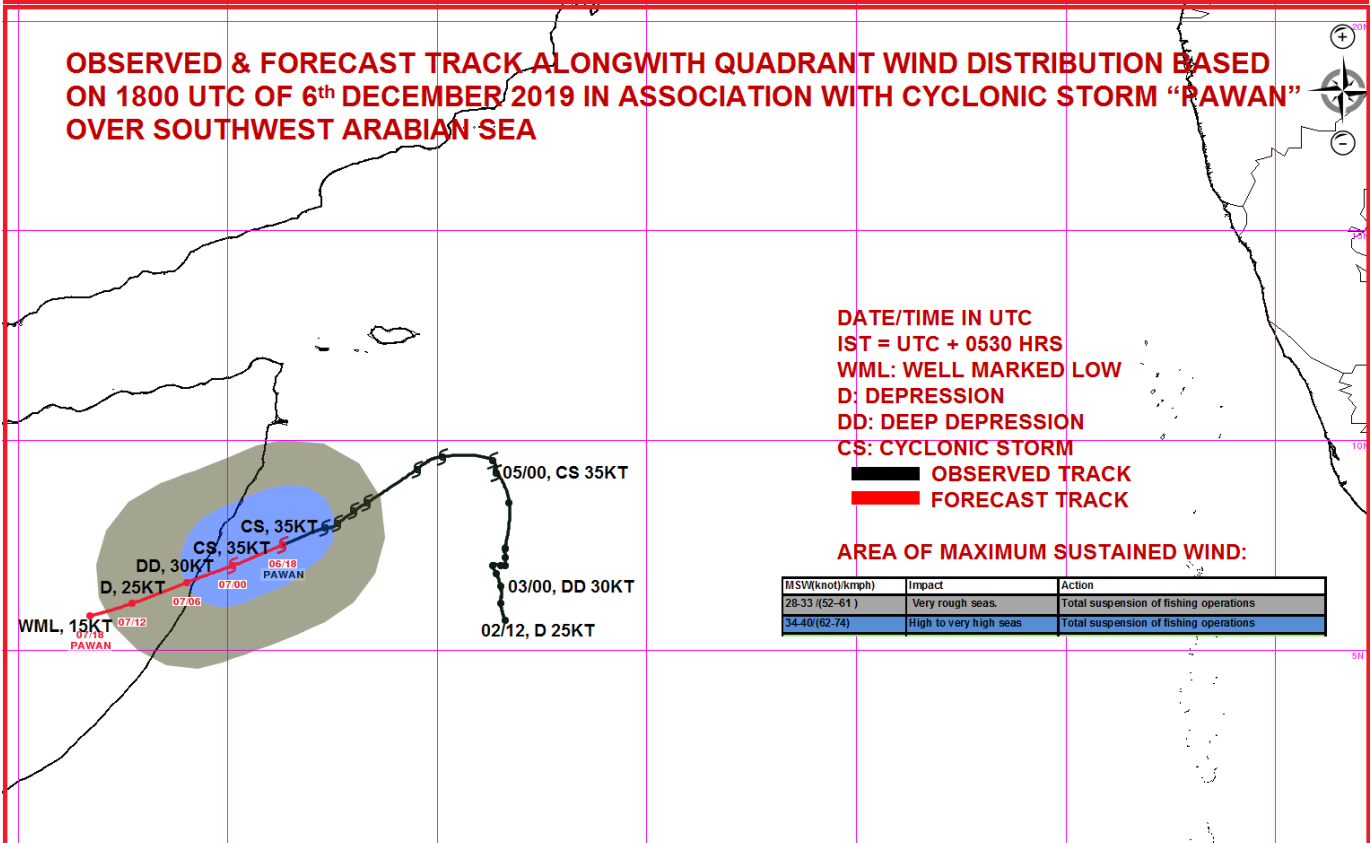
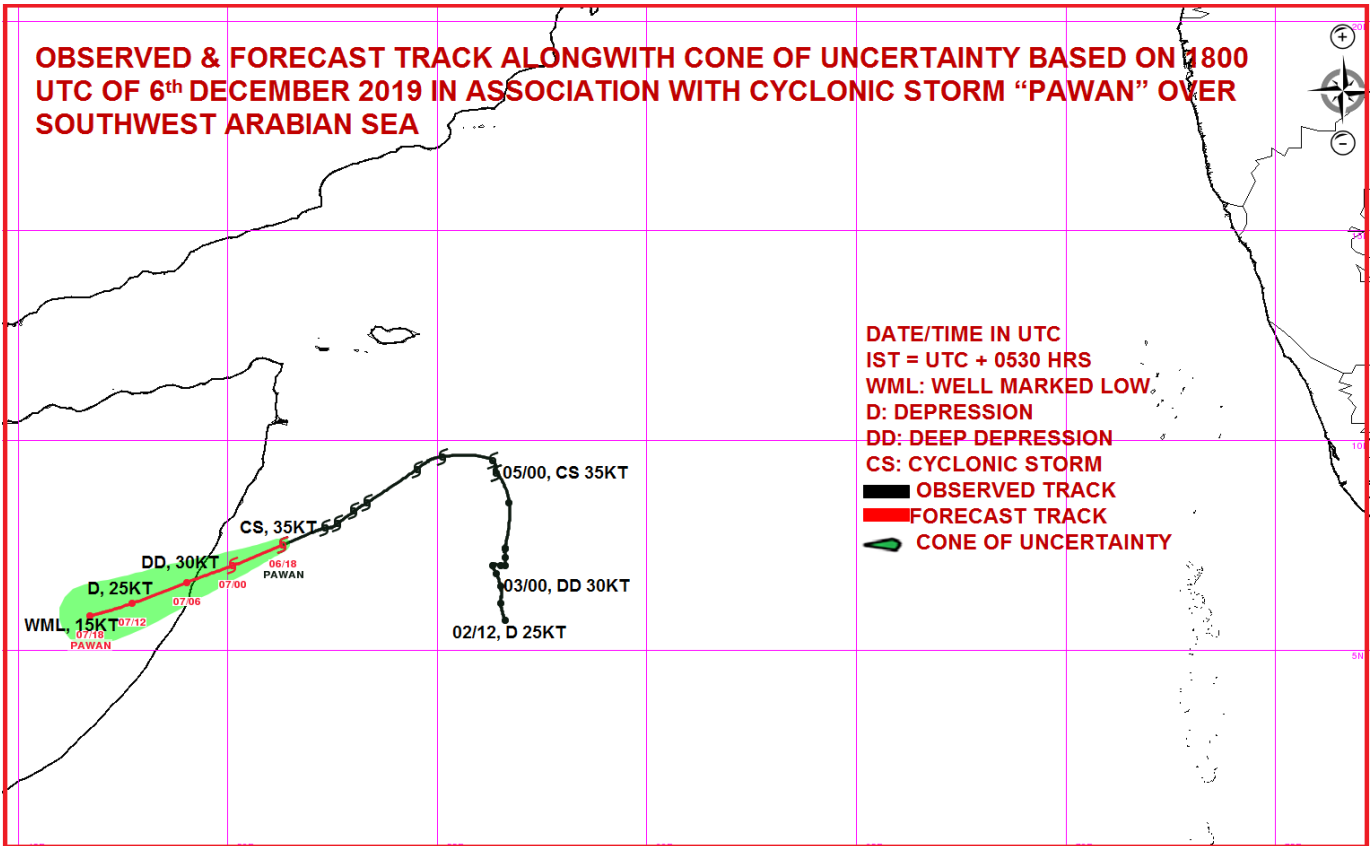
THE SYSTEM IS LIKELY TO MOVE WEST-SOUTHWESTWARDS UNDER THE INFLUENCE OF THE ANTICYCLONE TO THE WEST OF SOMALIA. IT WILL CROSS SOMALIA COAST AS A DEEP DEPRESSION AROUND LATITUDE  $07^{\circ}\text{N}$  DURING 0400-0700 UTC OF 07<sup>TH</sup> DECEMBER. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

**(V.R DURAI)**  
**SCIENTIST-E, RSMC, NEW DELHI**

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
 NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%





**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.17**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 07.12.2019**

**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.17 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0300 UTC OF 07.12.2019 BASED ON 0000 UTC OF 07.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA MOVED WEST-SOUTHWESTWARDS WITH A SPEED OF 24 KMPH DURING PAST 06 HOURS AND LAY CENTERED AT 0000 UTC OF 07<sup>TH</sup> DECEMBER, 2019 NEAR LATITUDE 7.4°N AND LONGITUDE 49.8°E OVER SOUTHWEST ARABIAN SEA. LATEST OBSERVATIONS INDICATE THAT THE SYSTEM IS CROSSING SOMALIA COAST CLOSE TO LATITUDE 7.4°N AND LONGITUDE 49.6°E. IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS AND WEAKEN GRADUALLY.**

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

<b>DATE/ TIME(UTC)</b>	<b>POSITION (LAT. °N/ LONG. °E)</b>	<b>MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)</b>	<b>CATEGORY OF CYCLONIC DISTURBANCE</b>
07.12.19/0000	7.4/49.8	60-70 GUSTING TO 80	CYCLONIC STORM
07.12.19/0600	7.2/49.2	45-55 GUSTING TO 65	DEPRESSION
07.12.19/1200	7.0/48.7	40-50 GUSTING TO 60	DEPRESSION

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 0000 UTC ON 06<sup>TH</sup> DECEMBER, 2019, THE CURRENT INTENSITY OF THE SYSTEM IS T2.5. ASSOCIATED BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHWEST ARABIAN SEA AND ADJOINING COASTAL SOMALIA BETWEEN LAT 7.0°N TO 10.0°N AND LONG 49.5°E TO 52.0°E. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 35 KNOTS GUSTING TO 45 KNOTS. THE ESTIMATED CENTRAL PRESSURE IS 998 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH AROUND THE SYSTEM CENTRE.

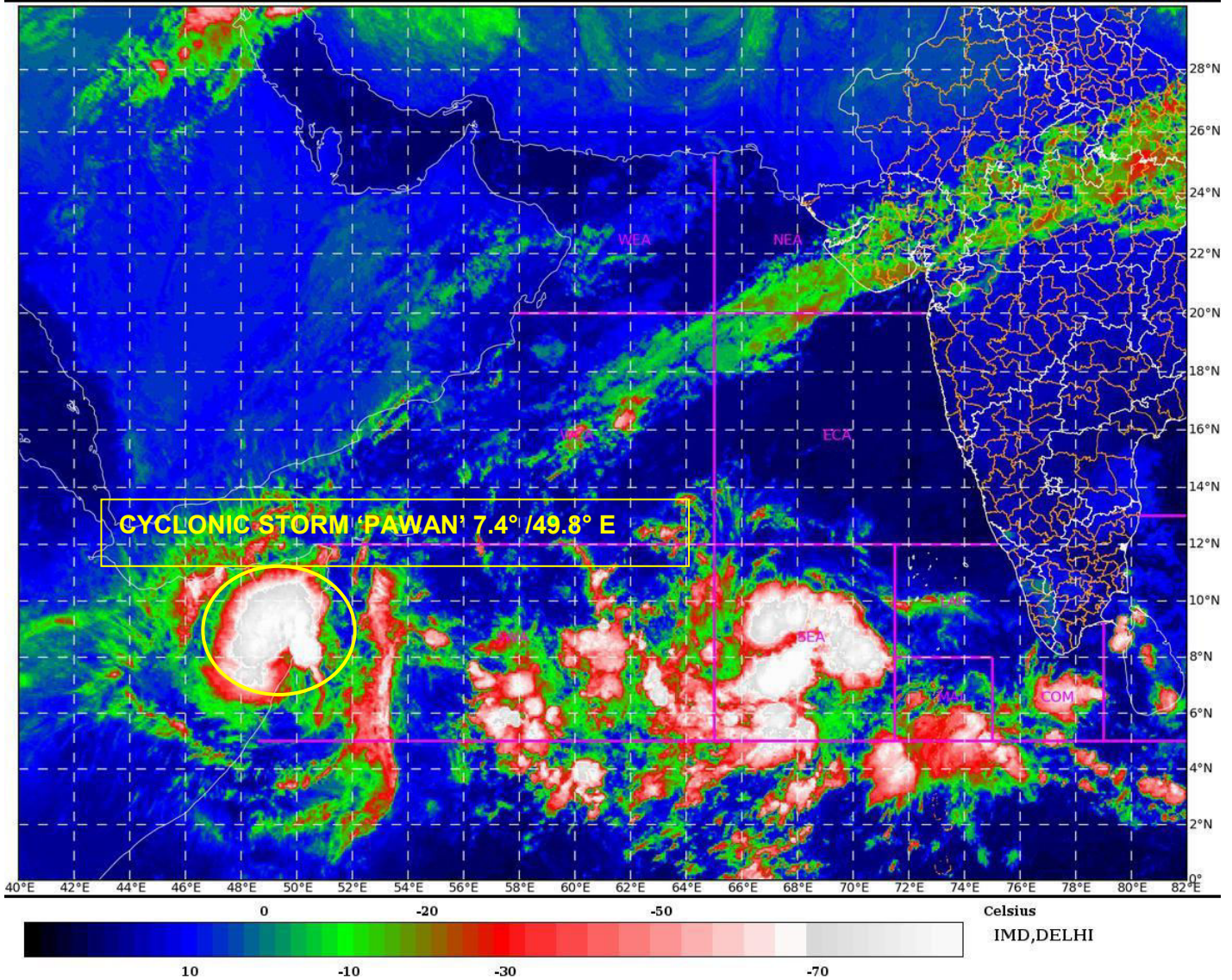
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH INCREASING AMPLITUDE. CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE HAS INCREASED AND NOW IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  AROUND THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW TO MODERATE (05-10 KNOTS) OVER THE SYSTEM. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $13^{\circ}$  N. SEA SURFACE TEMPERATURE IS ABOUT  $26-27^{\circ}\text{C}$  AND TROPICAL CYCLONE HEAT POTENTIAL IS  $30-40 \text{ KJ/CM}^2$  OVER THE REGION. LATEST OBSERVATIONS INDICATE THAT THE SYSTEM IS CROSSING SOMALIA COAST CLOSE TO LATITUDE  $7.4^{\circ}\text{N}$  AND LONGITUDE  $49.6^{\circ}\text{E}$ . IT IS VERY LIKELY TO MOVE WEST-SOUTHWESTWARDS AND WEAKEN GRADUALLY. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

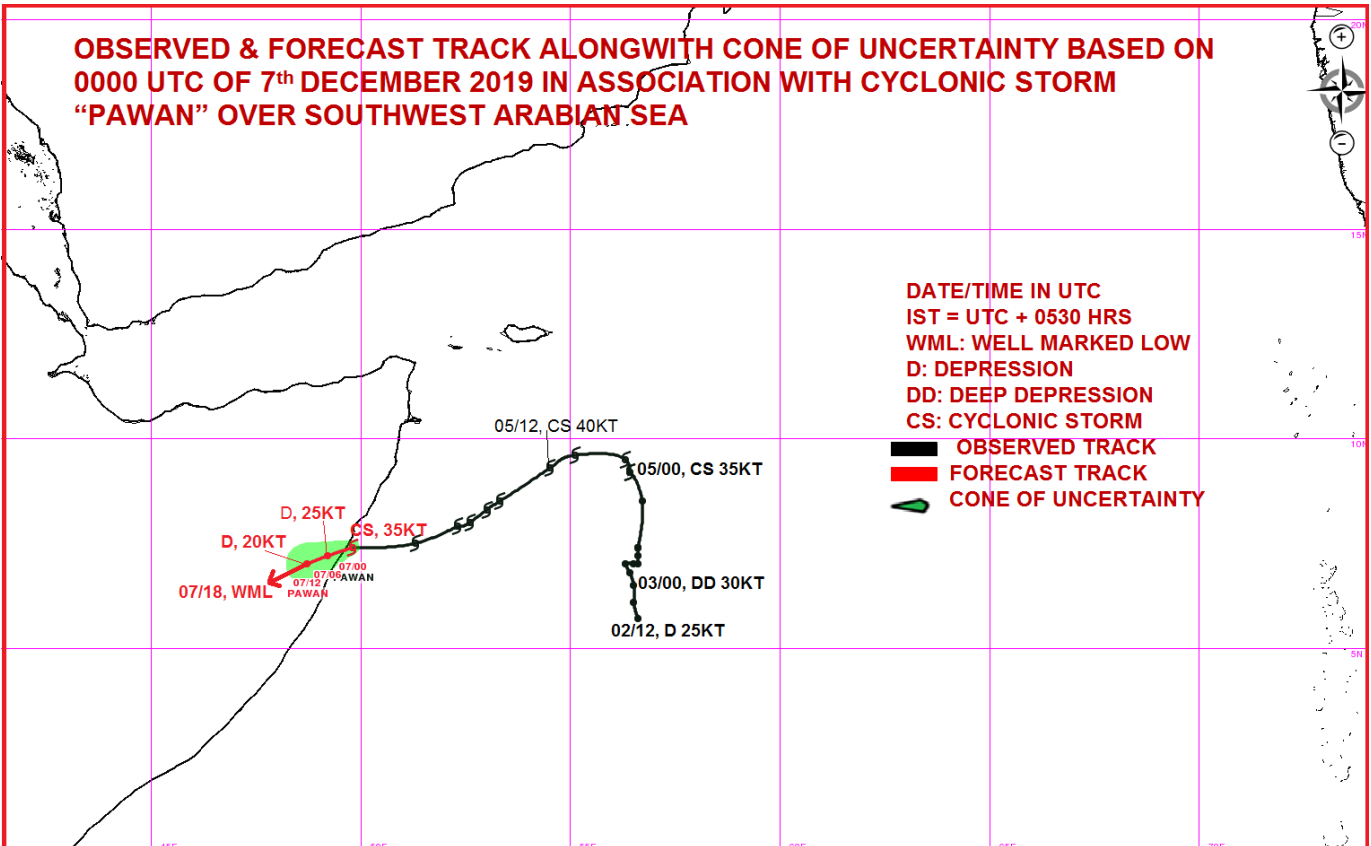
**(V.R DURAI)**  
**SCIENTIST-E, RSMC, NEW DELHI**


**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**



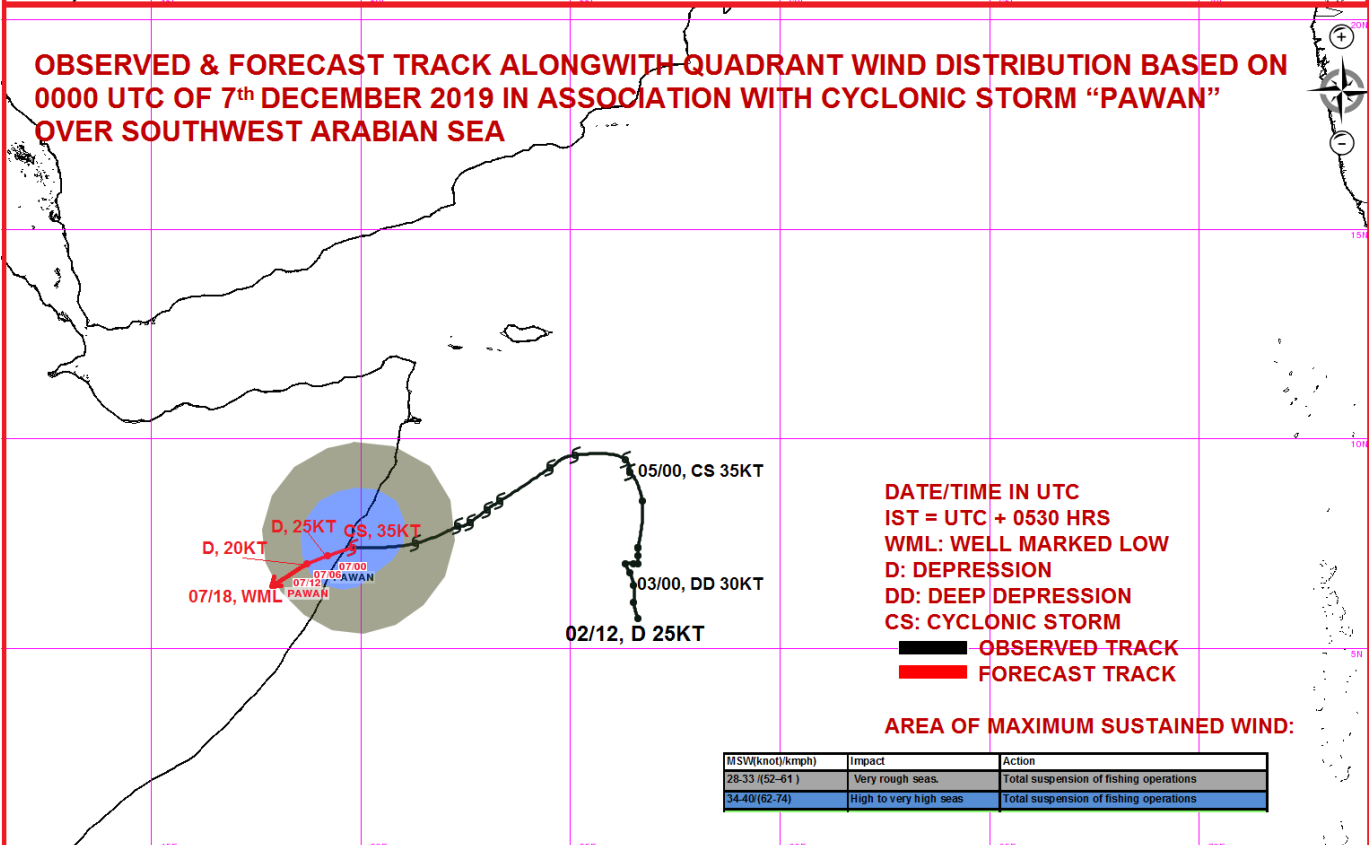
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%

**OBSERVED & FORECAST TRACK ALONGWITH CONE OF UNCERTAINTY BASED ON 0000 UTC OF 7<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA**



DATE/TIME IN UTC  
 IST = UTC + 0530 HRS  
 WML: WELL MARKED LOW  
 D: DEPRESSION  
 DD: DEEP DEPRESSION  
 CS: CYCLONIC STORM  
 — OBSERVED TRACK  
 — FORECAST TRACK  
 CONE OF UNCERTAINTY

**OBSERVED & FORECAST TRACK ALONGWITH QUADRANT WIND DISTRIBUTION BASED ON 0000 UTC OF 7<sup>th</sup> DECEMBER 2019 IN ASSOCIATION WITH CYCLONIC STORM "PAWAN" OVER SOUTHWEST ARABIAN SEA**



DATE/TIME IN UTC  
 IST = UTC + 0530 HRS  
 WML: WELL MARKED LOW  
 D: DEPRESSION  
 DD: DEEP DEPRESSION  
 CS: CYCLONIC STORM  
 — OBSERVED TRACK  
 — FORECAST TRACK

**AREA OF MAXIMUM SUSTAINED WIND:**

M/SV(knot/kmph)	Impact	Action
28-33 (52-61)	Very rough seas.	Total suspension of fishing operations
34-40 (62-74)	High to very high seas	Total suspension of fishing operations

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**



**REGIONAL SPECIALISED METEOROLOGICAL CENTRE-TROPICAL CYCLONES, NEW DELHI  
TROPICAL CYCLONE ADVISORY BULLETIN NO.18**

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 07.12.2019**

**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.18 FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0600 UTC OF 07.12.2019 BASED ON 0300 UTC OF 07.12.2019.**

**SUB: CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN') OVER SOUTHWEST ARABIAN SEA  
CROSSED SOMALIA COAST AND WEAKENED INTO A DEEP DEPRESSION OVER COASTAL  
SOMALIA**

**CYCLONIC STORM 'PAWAN' (PRONOUNCED AS 'PAVAN')** OVER SOUTHWEST ARABIAN SEA MOVED NEARLY WESTWARDS WITH A SPEED OF 26 KMPH DURING PAST 06 HOURS, CROSSED SOMALIA COAST NEAR LATITUDE 7.4°N AND LONGITUDE 49.6°E DURING 0200 TO 0300 UTC OF 07<sup>TH</sup> DECEMBER 2019 AS A CYCLONIC STORM WITH A WIND SPEED OF 60-70 KMPH GUSTING TO 80 KMPH, WEAKENED INTO A DEEP DEPRESSION AND LAY CENTERED AT 0300 UTC OF 07<sup>TH</sup> DECEMBER, 2019 OVER COASTAL SOMALIA AND NEIGHBOURHOOD NEAR LATITUDE 7.4°N AND LONGITUDE 49.5°E. IT IS VERY LIKELY TO CONTINUE TO MOVE NEARLY WESTWARDS AND WEAKEN INTO A DEPRESSION DURING NEXT 06 HOURS AND INTO A WELL MARKED LOW PRESSURE AREA DURING THE SUBSEQUENT 12 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

DATE/ TIME (UTC)	POSITION (LAT. °N/ LONG. °E)	MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)	CATEGORY OF CYCLONIC DISTURBANCE
07.12.19/0300	7.4/49.5	55-65 GUSTING TO 75	DEEP DEPRESSION
07.12.19/0600	7.2/49.0	45-55 GUSTING TO 65	DEPRESSION
07.12.19/1200	7.0/47.8	35-45 GUSTING TO 55	DEPRESSION

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 0300 UTC ON 06<sup>TH</sup> DECEMBER, 2019, BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER NORTH SOMALIA AND ADJOINING SOUTHWEST ARABIAN SEA AND ADJOINING COASTAL SOMALIA BETWEEN LAT 6.5°N TO 11.0°N AND LONG 47.0°E TO 51.0°E IN ASSOCIATION WITH THE VORTEX OVER NORTH SOMALIA COAST AND NEIGHBOURHOOD. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C. MICROWAVE IMAGERY SHOWS INTENSE CONVECTIVE CLOUD MASS OVER NORTH AND NORTH-EAST SECTOR OF THE SYSTEM.

THE ESTIMATED MAXIMUM SUSTAINED WIND SPEED IS 30 KNOTS GUSTING TO 40 KNOTS. THE

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

ESTIMATED CENTRAL PRESSURE IS 1000 HPA. THE SEA CONDITION IS VERY ROUGH TO HIGH OVER WESTERN PARTS OF SOUTHWEST ARABIAN AND ALONG AND OFF SOMALIA COAST.

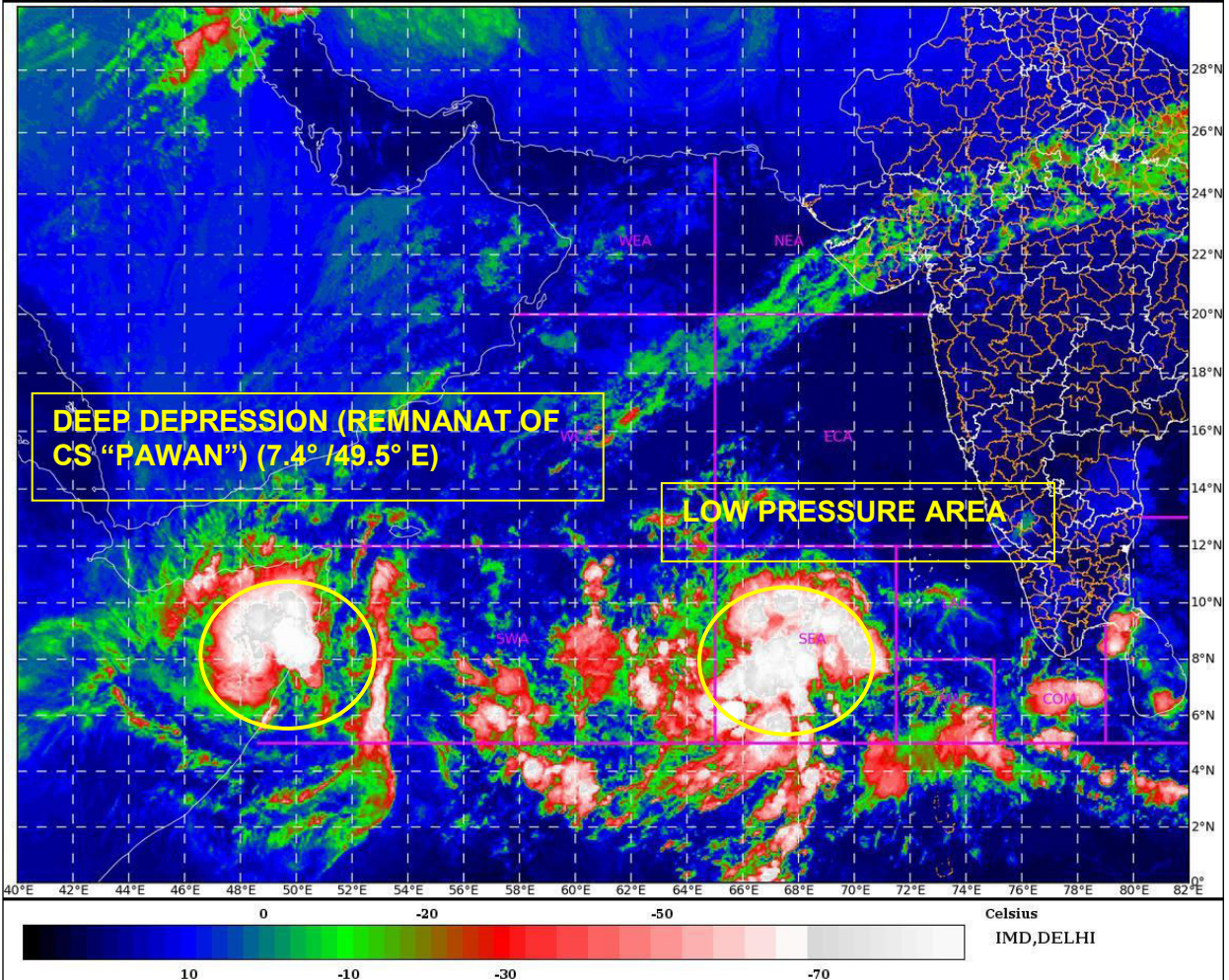
THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH AMPLITUDE MORE THAN 1. CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $150 \times 10^{-5} \text{SEC}^{-1}$  TO THE SOUTH OF THE SYSTEM CENTRE. THE LOWER LEVEL CONVERGENCE IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE SOUTHWEST OF THE SYSTEM CENTRE AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $20 \times 10^{-5} \text{S}^{-1}$  TO THE WEST OF THE SYSTEM CENTRE. THE VERTICAL WIND SHEAR IS LOW (05-10 KNOTS) OVER THE SYSTEM AREA. THE UPPER TROPOSPHERIC RIDGE RUNS ALONG  $11^{\circ}$  N OVER THE SYSTEM AREA. THE SYSTEM IS VERY LIKELY TO CONTINUE TO MOVE NEARLY WESTWARDS UNDER THE INFLUENCE OF THE UPPER LEVEL EASTERLIES TO THE SOUTH OF THE RIDGE AND WEAKEN GRADUALLY. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE ANALYSIS.

**(NEETHA K GOPAL)**  
**SCIENTIST-E, RSMC, NEW DELHI**

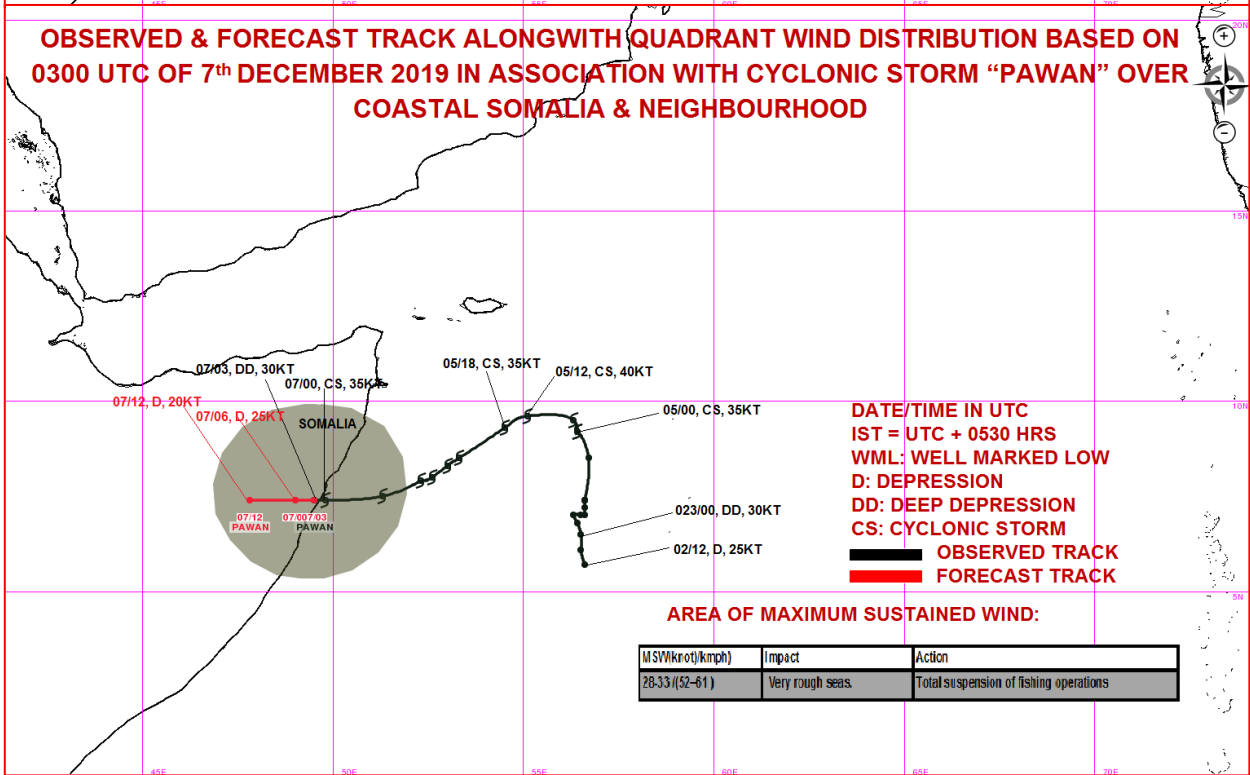
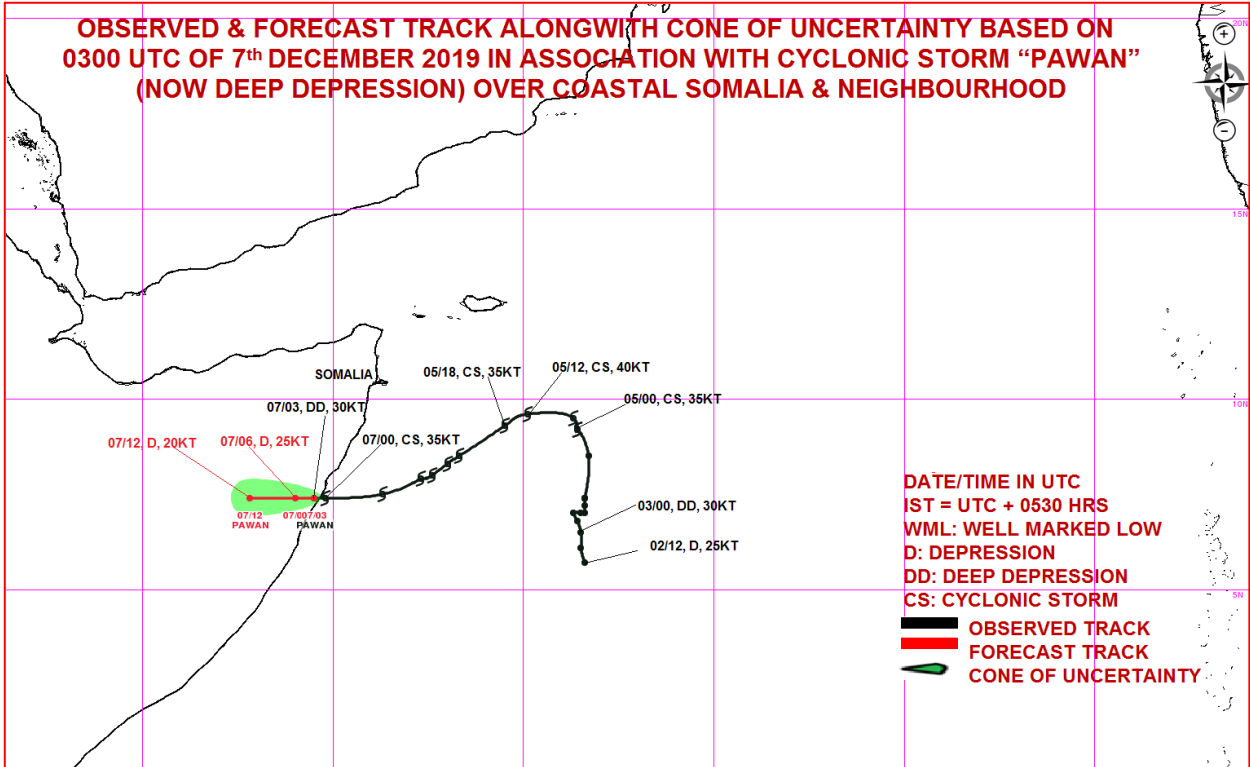
**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

SAT : INSAT-3D IMG  
IMG\_TIR1\_TEMP 10.8 um  
ARABIAN SEA

07-12-2019/(0330 to 0357) GMT  
07-12-2019/(0900 to 0927) IST



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**





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

**DEMS-RSMC TROPICAL CYCLONES NEW DELHI DATED 07.12.2019**

**SPECIAL TROPICAL WEATHER OUTLOOK FOR NORTH INDIAN OCEAN (THE BAY OF BENGAL AND ARABIAN SEA) VALID FOR NEXT 120 HOURS ISSUED AT 0900 UTC OF 07.12.2019 BASED ON 0600 UTC OF 07.12.2019.**

**SUB: (A) DEEP DEPRESSION OVER NORTH SOMALIA AND NEIGHBOURHOOD; (B) LOW PRESSURE AREA OVER SOUTHEAST ARABIAN SEA AND ADJOINING EQUATORIAL INDIAN OCEAN**

**(A) DEEP DEPRESSION OVER NORTH SOMALIA AND NEIGHBOURHOOD:**

**THE DEEP DEPRESSION** OVER COASTAL SOMALIA AND NEIGHBORHOOD MOVED WESTWARDS WITH A SPEED OF 16 KMPH DURING PAST 06 HOURS, AND LAY CENTERED AT 0600 UTC OF TODAY, THE 07<sup>TH</sup> DECEMBER, 2019 OVER NORTH SOMALIA AND NEIGHBORHOOD NEAR LATITUDE 7.4°N AND LONGITUDE 48.9°E. IT IS VERY LIKELY TO CONTINUE TO MOVE NEARLY WESTWARDS AND WEAKEN INTO A DEPRESSION DURING NEXT 06 HOURS AND INTO A WELL MARKED LOW PRESSURE AREA DURING THE SUBSEQUENT 06 HOURS.

FORECAST TRACK AND INTENSITY ARE GIVEN IN THE FOLLOWING TABLE:

<b>DATE/TIME (UTC)</b>	<b>POSITION (LAT. °N/ LONG. °E)</b>	<b>MAXIMUM SUSTAINED SURFACE WIND SPEED (KMPH)</b>	<b>CATEGORY OF CYCLONIC DISTURBANCE</b>
07.12.19/0600	7.4/48.9	50-60 GUSTING TO 70	DEEP DEPRESSION
07.12.19/1200	7.4/48.0	45-55 GUSTING TO 65	DEPRESSION
07.12.19/1800	7.4/46.9	25-35 GUSTING TO 45	WELL MARKED LOW

**(B) LOW PRESSURE AREA OVER SOUTHEAST ARABIAN SEA AND ADJOINING EQUATORIAL INDIAN OCEAN:**

A LOW PRESSURE AREA LIES OVER SOUTHEAST ARABIAN SEA AND ADJOINING EQUATORIAL INDIAN OCEAN. IT IS LIKELY TO BECOME MORE MARKED DURING NEXT 24 HOURS.

**REMARKS:**

AS PER THE SATELLITE IMAGERY OF 0600 UTC ON 06<sup>TH</sup> DECEMBER, 2019, BROKEN LOW TO MEDIUM CLOUDS WITH EMBEDDED INTENSE TO VERY INTENSE CONVECTION LIES OVER SOUTHEAST ARABIAN SEA AND ADJOINING EQUATORIAL INDIAN OCEAN BETWEEN LAT 4.0°N TO 10.0°N AND LONG 62.5°E TO 69.0°E IN ASSOCIATION WITH THE LOW LEVEL CIRCULATION OVER THE AREA. MINIMUM CLOUD TOP TEMPERATURE IS MINUS 93 DEG C.

THE MJO LIES IN PHASE 2 WITH AMPLITUDE MORE THAN 1. IT WILL REMAIN IN THE SAME PHASE DURING NEXT 5-6 DAYS WITH AMPLITUDE MORE THAN 1. CONSIDERING THE ENVIRONMENTAL CONDITIONS, THE LOW LEVEL RELATIVE VORTICITY IS ABOUT  $50 \times 10^{-5} \text{SEC}^{-1}$  OVER THE LOW PRESSURE AREA. THE LOWER LEVEL CONVERGENCE IS ABOUT  $30 \times 10^{-5} \text{S}^{-1}$  AND THE UPPER LEVEL DIVERGENCE IS ABOUT  $40 \times 10^{-5} \text{S}^{-1}$  OVER THE SYSTEM AREA. THE SYSTEM LIES IN AN AREA WITH LOW (5-15 KNOTS) VERTICAL WIND SHEAR. THE UPPER TROPOSPHERIC RIDGE RUNS ROUGHLY ALONG 14° N OVER THE SYSTEM AREA. SEA SURFACE TEMPERATURE IS ABOUT 30°C AND TROPICAL CYCLONE HEAT POTENTIAL IS 90-100 KJ/CM2 OVER THE AREA OF THE SYSTEM.

AS THE SYSTEM IS LYING IN A FAVOURABLE ENVIRONMENTAL CONDITION THE SYSTEM IS LIKELY TO BECOME MORE MARKED DURING NEXT 24 HOURS. MAJORITY OF NUMERICAL MODELS AGREE WITH THE ABOVE PROGNOSIS.

**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**

**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**

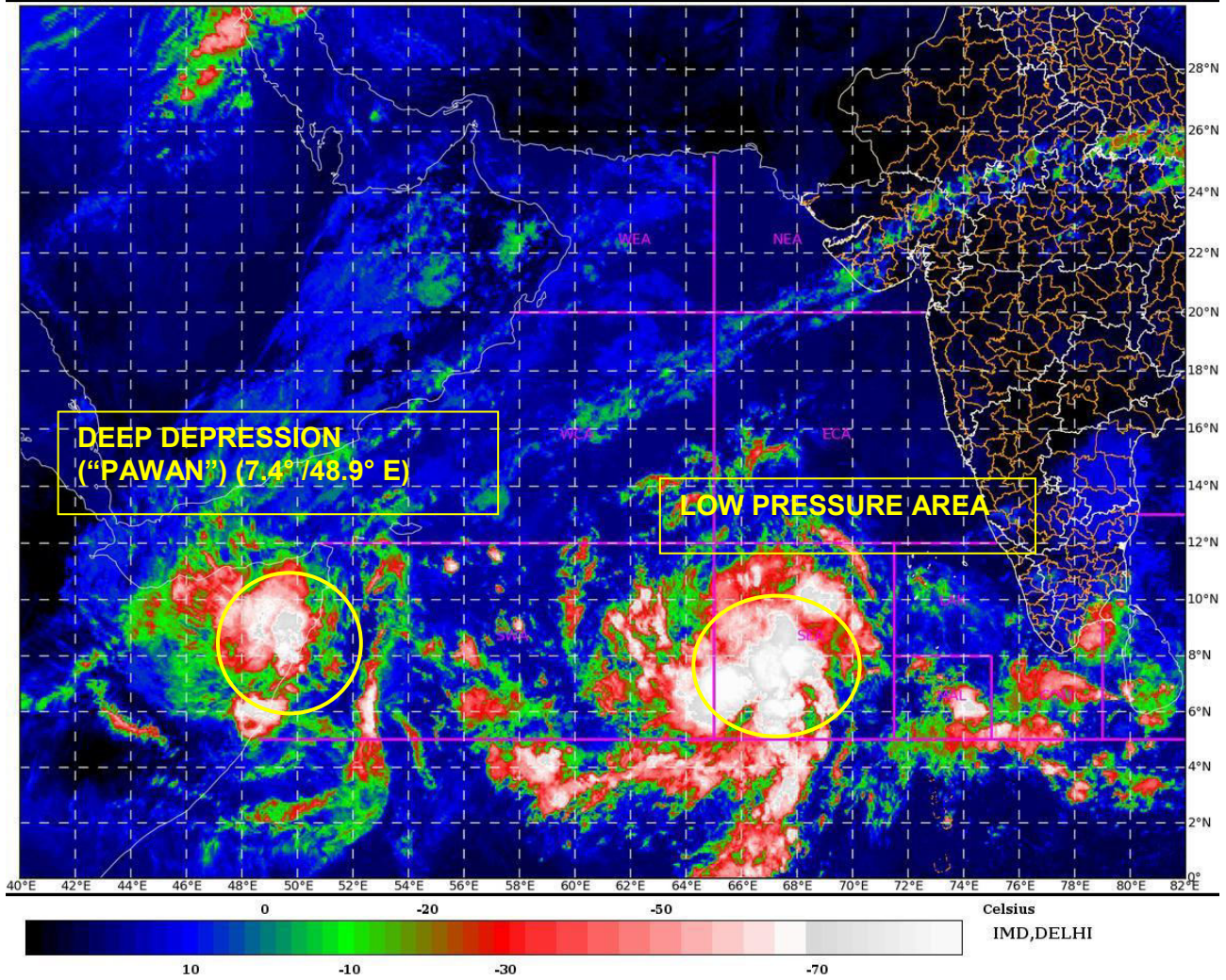
**Probability of cyclogenesis over Bay of Bengal and Andaman Sea during next 120 hours:**

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
Nil	Nil	Nil	Nil	Nil

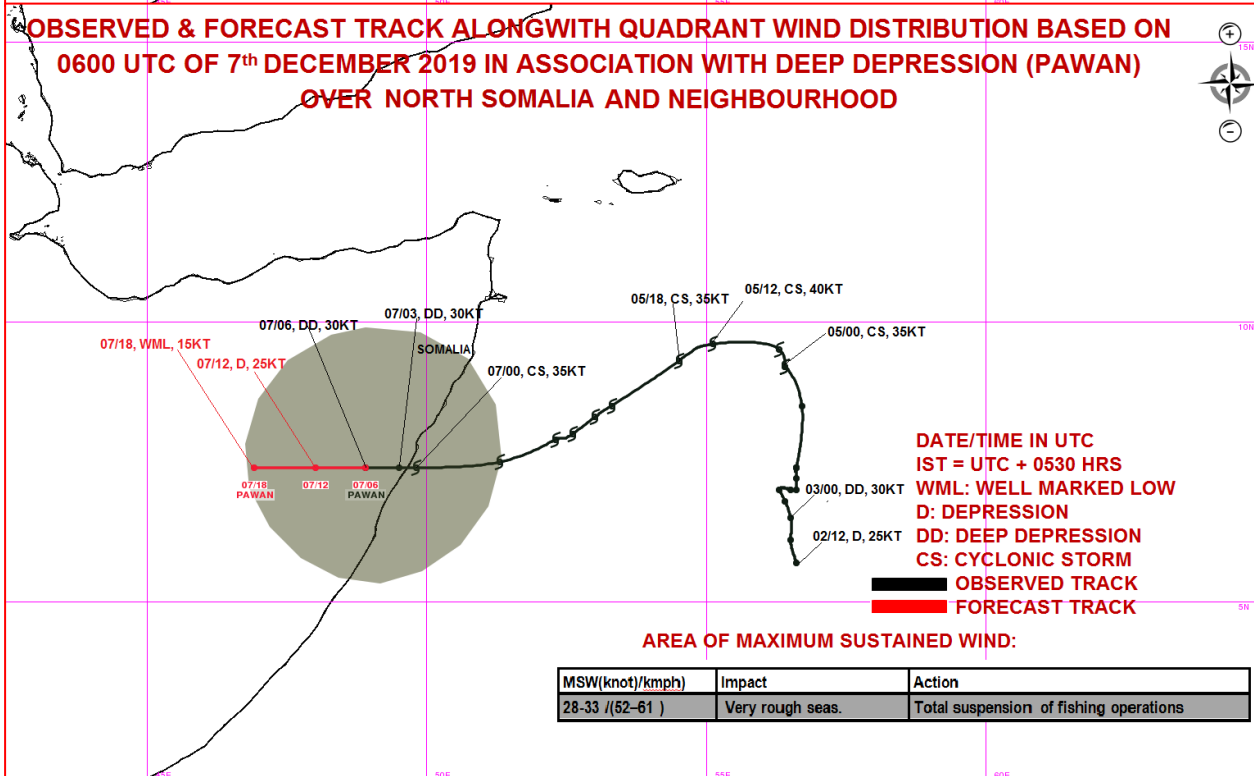
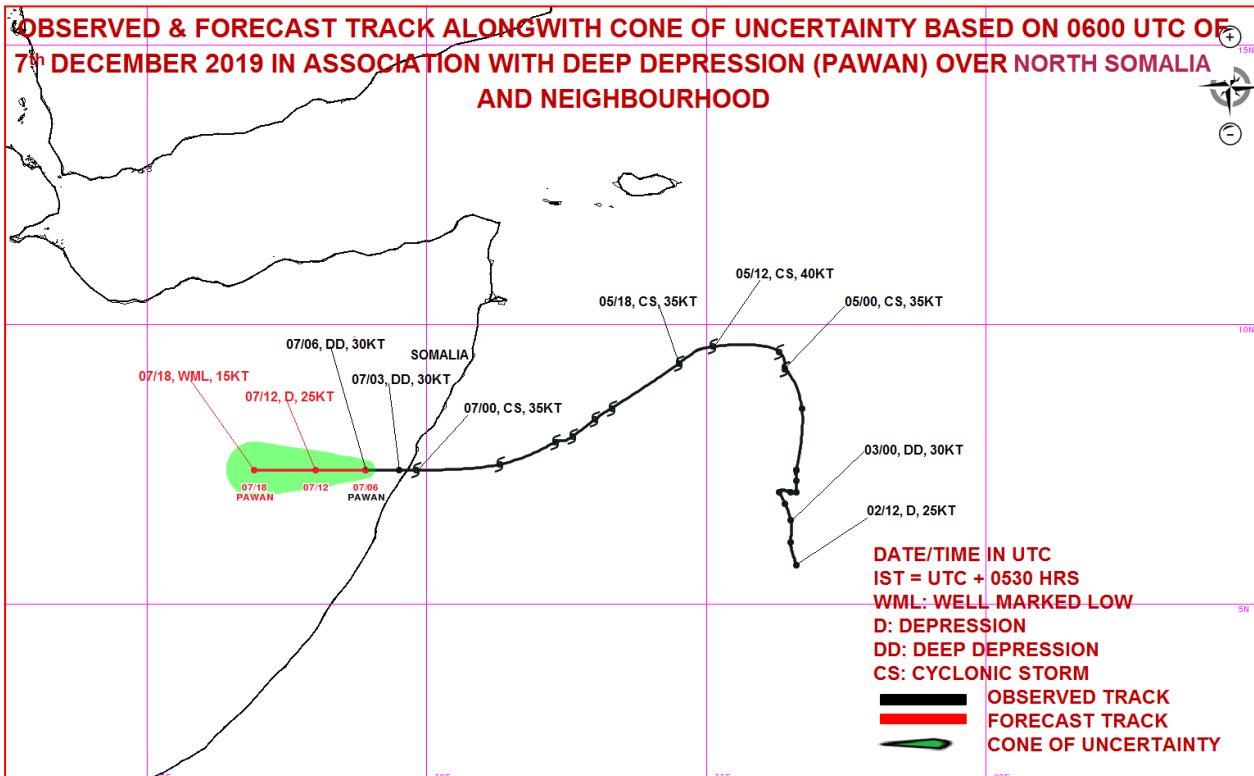
**Probability of cyclogenesis over Arabian Sea during next 120 hours:**

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS
Nil	Low	Moderate	Nil	Nil

(NEETHA K GOPAL)  
SCIENTIST-E, RSMC, NEW DELHI



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%



**PROBABILITY OF CYCLOGENESIS (FORMATION OF DEPRESSION)**  
**NIL: 0%, LOW: 1-25%, FAIR: 26-50%, MODERATE: 51-75% AND HIGH 76-100%**