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**Ministry of Earth Sciences  
India Meteorological Department  
Cyclone Warning Division, New Delhi**

**Tropical Cyclone Forecast Programme  
Report Dated 01<sup>st</sup> December 2024**

**Time of Issue: 1100 UTC**

**Synoptic features (based on 0600 UTC analysis):**

The **Cyclonic Storm “FENGAL” [pronounced as FEINJAL]** over north coastal Tamil Nadu & Puducherry remained practically stationary during past 12 hours, weakened into a deep depression and lay centered at 0600 UTC of today, the 1<sup>st</sup> December 2024 over the same region near latitude 12.0°N and longitude 79.8°E, close to Puducherry, about 30 km north of Cuddalore, 40 km east of Villupuram and 120 km south-southwest of Chennai.

It is likely to move westwards very slowly and weaken gradually into a depression over north Tamil Nadu during the next 12 hours.

**Environmental Features based on 03 UTC:**

<b>Parameter</b>	<b>Bay of Bengal (BoB)</b>	<b>Arabian Sea (AS)</b>
<b>Sea Surface Temperature (SST) °C</b>	<ul style="list-style-type: none"> <li>➤ 28-30°C over BoB.</li> <li>➤ 26-28°C along &amp; off Sri Lanka/Tamil Nadu/ Andhra Pradesh coasts.</li> </ul>	<ul style="list-style-type: none"> <li>➤ 28-30°C over most parts of AS.</li> <li>➤ 26-28°C over some parts of westcentral AS along and off Somalia coast AS.</li> </ul>
<b>Tropical Cyclone Heat Potential (TCHP) kJ/cm<sup>2</sup></b>	<ul style="list-style-type: none"> <li>➤ 140-150 over system area some part of northeast, south BoB &amp; adjoining EIO.</li> <li>➤ 40-50 over southwest &amp; adjoining westcentral BoB and along &amp; off Sri Lanka/Tamil Nadu/ Andhra Pradesh coasts</li> </ul>	<ul style="list-style-type: none"> <li>➤ 90-110 over most parts of south, central AS, Lakshadweep Island.</li> <li>➤ 20-40 over rest of the area.</li> </ul>
<b>Cyclonic Relative vorticity (X10<sup>-6</sup>s<sup>-1</sup>)</b>	<ul style="list-style-type: none"> <li>➤ 150-160 over southwest BoB along &amp; off Tamil Nadu coast.</li> <li>➤ 30-50 southwest and adjoining westcentral BoB.</li> </ul>	<ul style="list-style-type: none"> <li>➤ 10-20 over eastcentral, South AS the coast of Somalia.</li> <li>➤ 30-40 over some parts of northwest AS</li> </ul>
<b>Low Level convergence(X10<sup>-5</sup> s<sup>-1</sup>)</b>	<ul style="list-style-type: none"> <li>➤ 05-10 over westcentral and adjoining southwest BoB along &amp; Tamil Nadu/</li> </ul>	--

	Andhra Pradesh coasts.	
<b>Upper-Level divergence (<math>\times 10^{-5} \text{ s}^{-1}</math>)</b>	➤ 10-20 over westcentral BoB.	➤ 5-10 over parts of southeast AS.
<b>Vertical Wind Shear (VWS knots)</b> Low: 05-10 knots Moderate: 10-20 knots High: >20 knots	➤ High over north BoB. ➤ Low-Moderate over central BoB and Andaman Sea.	➤ High over north AS. ➤ Low-Moderate over westcentral and adjoining south AS.
<b>Wind Shear Tendency (knots)</b>	➤ Increasing over north & south BoB ➤ Decreasing over central BoB and along and off Tamil Nadu/ Andhra Pradesh coasts.	➤ Increasing over north & south AS. ➤ Decreasing over central AS.
<b>Upper tropospheric Ridge</b>	➤ At 15° N.	➤ At 15° N.

### **Satellite observations based on INSAT imagery (0300 UTC):**

**a) Over the BoB & Andaman Sea: -**

Scattered to broken low and medium clouds with embedded intense to very intense convection lay over central, south Bay of Bengal & South Andaman Sea (Minimum Cloud Top Temperature is minus 70-90 degrees Celsius). Scattered low and medium clouds with embedded weak to moderate convection lay over North Bay of Bengal & North Andaman Sea.

**b) Over the Arabian Sea:**

Scattered low and medium clouds with embedded moderate to intense convection lay over eastcentral & southeast Arabian Sea, Lakshadweep Islands area.

**c) Outside India:**

Scattered low/med clouds with embedded moderate to intense convection lay over Maldives, north Tibet adjoining China, Myanmar, south Thailand, Gulf of Thailand, south Vietnam, Sumatra, Strait of Malacca, Malaysia, Borneo, south China Sea, Java Islands & Sea, Celebes Islands & Sea, Philippines, north Madagascar, north Mozambique Channel and over Indian Ocean between Lat 5.0N to 14.0S Long 60.0E to 120.0E.

### **M.J.O. Index:**

Madden Julian Oscillation (MJO) is in phase 5 with amplitude more than 1 and would remain in same phase during next 8 days with amplitude more than 1.

**NWP Guidance for FDP Cyclone based on 0000 UTC for the next 7 days:**

<b>MODEL GUIDANCE</b>	<b>Bay of Bengal (BoB)</b>	<b>Arabian Sea (AS)</b>
<b>IMD-GFS</b>	Model is indicating CS over Puducherry coast as on today, it will move in west-southwestwards and weaken into WML by 2 <sup>nd</sup> December. It will become feeble low and move across southern Peninsular India, entered the southeast Arabian Sea on 4 <sup>th</sup> as LPA.	The remnant of Bay of Bengal system will emerge into the southeast & adjoining eastcentral Arabian Sea on 4 <sup>th</sup> December as LPA. Model is indicating its west-southwestwards movement with further intensification as CS on 6 <sup>th</sup> over southwest Arabian Sea. It continues moving in same direction towards Somalia coast till 8 <sup>th</sup> while weakening.
<b>IMD-GEFS</b>	Model is indicating depression over Puducherry coast as on today, it will move west-southwestwards and weaken thereafter. It will move across southern peninsular India and emerge into the southeast Arabian Sea on 4 <sup>th</sup> December.  Another extended low is likely over southwest Bay of Bengal and adjoining equatorial Indian Ocean on 8 <sup>th</sup> .	The remnant of Bay of Bengal system will emerge into the southeast & adjoining eastcentral Arabian Sea on 4 <sup>th</sup> December as WML. It will move in west-southwestward direction towards Somalia coast till 7 <sup>th</sup> December without further intensification and less marked by 8 <sup>th</sup> .
<b>IMD-WRF</b>	CS over Puducherry coast as on today, it will move in west-southwestwards and weaken into WML by 2 <sup>nd</sup> December. It will become feeble low and move across southern Peninsular India, entered the southeast Arabian Sea on 3 <sup>rd</sup> as WML/D.	The remnant of Bay of Bengal system will emerge into the southeast & adjoining eastcentral Arabian Sea on 3 <sup>rd</sup> December as WML/D. Model is indicating its west-southwestwards movement with further intensification as DD/CS on 4 <sup>th</sup> over southeast Arabian Sea.
<b>NCMRWF-NCUM(G)</b>	Model is indicating CS over Puducherry coast as on today, it will move in west-southwestwards and weaken into DD over land, close to the coast by 2 <sup>nd</sup> December. It will move across southern peninsular India and emerge into the southeast Arabian Sea on 4 <sup>th</sup> as WML.	The remnant of Bay of Bengal system will emerge into the southeast & adjoining eastcentral Arabian Sea on 4 <sup>th</sup> December as WML. Model is indicating its west-southwestwards movement and will intensify into DD on 5 <sup>th</sup> , weaken thereafter.
<b>NCMRWF-NCUM(R)</b>	Model is indicating CS over Puducherry coast as on today, it will move in west-southwestwards and lay as CS over land, close to the coast by 2 <sup>nd</sup> December. It will move in the same direction while weakening and emerge into southeast Arabian Sea by 4 <sup>th</sup> December as LPA.	The remnant of Bay of Bengal system will emerge into the southeast & adjoining eastcentral Arabian Sea on 4 <sup>th</sup> December as LPA.
<b>NCMRWF-</b>	Model is indicating CS over Puducherry	The remnant of Bay of Bengal

<b>NEPS</b>	coast as on today, it will move in west-southwestwards and weaken into DD over land, close to the coast by 2 <sup>nd</sup> December. It will move across southern peninsular India while weakening and emerge into the southeast Arabian Sea on 4 <sup>th</sup> as WML.	system will emerge into the southeast & adjoining eastcentral Arabian Sea on 4 <sup>th</sup> December as WML. Model is indicating its west-southwestwards movement and will intensify into DD on 5 <sup>th</sup> , weaken thereafter gradually.
<b>ECMWF</b>	Model is indicating CS over Puducherry coast as on today, it will move in west-southwestwards direction and weaken into depression by 2 <sup>nd</sup> December 00 UTC. It will move across southern Peninsular India, entered the southeast Arabian Sea on 15 UTC of 3 <sup>rd</sup> December as LPA.	The remnant of Bay of Bengal system will emerge into the southeast & adjoining eastcentral Arabian Sea on 3 <sup>rd</sup> December 15 UTC as LPA. Model is indicating its west-southwestwards movement without further intensification till 6 <sup>th</sup> /03 UTC.
<b>NCEP-GFS</b>	Model is indicating DD/CS over Puducherry coast as on 1 <sup>st</sup> December 00 UTC. It will move west-southwestwards and cross the coast by 1 <sup>st</sup> /18 UTC. It will move over southern peninsular India and emerge into the southeast Arabian Sea on 4 <sup>th</sup> December/00 UTC as LPA.	The remnant of Bay of Bengal system will emerge into the southeast & adjoining eastcentral Arabian Sea on 4 <sup>th</sup> December 00 UTC as LPA. It will have west-southwestward movement towards Somalia coast without intensification till 6 <sup>th</sup> /18 UTC, less marked thereafter.

**Summary:**

**(a) Bay of Bengal:**

Most of the models are indicating that the system is crossing Puducherry coast as CS as on today the 01<sup>st</sup> December, system will weaken into deep depression by 2<sup>nd</sup> December over coastal Tamil Nadu, weaken gradually thereafter. All the models are also indicating that the system will move across the southern Peninsular India and emerge into southeast Arabian Sea.

**(b) Arabian Sea**

All the models are indicating likely remnant of Bay of Bengal into southeast and adjoining eastcentral Arabian Sea around 04<sup>th</sup> December. Thereafter models are indicating the system will move west-southwestwards and without having significant intensification. However, IMD-GFS is indicating intensification upto CS, IMD-WRF and NCUM(G), NCUM-NEPS is indicating intensification upto DD.

**Inference:**

**Considering various environmental conditions and model guidance, it is inferred that:**

The Cyclonic Storm “FENGAL” [pronounced as FEINJAL] over north coastal Tamil Nadu & Puducherry remained practically stationary during past 12 hours, weakened into a deep depression and lay centered at 1130 hours IST of today, the 1<sup>st</sup> December 2024 over the same region near latitude 12.0°N and longitude 79.8°E, close to Puducherry, about 30 km north of Cuddalore, 40 km east of Villupuram and 120 km south-southwest of Chennai.

It is likely to move westwards very slowly and weaken gradually into a depression over north Tamil Nadu during the next 12 hours.

**Probability of cyclogenesis (formation of depression and above intensity systems) over the Bay of Bengal during next 168 hours:**

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
-	-	NIL	NIL	NIL	NIL	NIL

**Probability of cyclogenesis (formation of depression and above intensity systems) over the Arabian Sea during next 168 hours:**

24 HOURS	24-48 HOURS	48-72 HOURS	72-96 HOURS	96-120 HOURS	120-144 HOURS	144-168 HOURS
NIL	NIL	NIL	LOW	LOW	-	-

“- “indicates genesis has already occurred.

Probability is indicated as NIL for 0%, LOW for 1-33%, MOD for 34-67% and High for 68-100%.

**Intense Observation Period (IOP):** Tamil Nadu coast during 01<sup>st</sup> December and Andhra Pradesh coast during 01<sup>st</sup> December.

# ANNEXURE















