GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION NO-2275
ANSWERED ON - 16/03/2021

CYCLONE WARNING SYSTEMS

2275. DR. AMEE YAJNIK:

Will the Minister of EARTH SCIENCES be pleased to state:

(a)   the number of functional Cyclone Warning Centres in the country, State/UT-wise;

(b)   whether the cyclone warning techniques available in the country are adequate in terms of efficiency and efficacy, as compared to other countries and if so, the details thereof;

(c)   the steps taken by the Government to improve the cyclone warning technology to reduce the effects and damage caused due to cyclones; and

(d)   whether the Government proposes to provide low cost devices for fishermen for getting information about cyclone warnings free of cost or at highly subsidized rate; and

(e)   if so, the details thereof and if not, the reasons therefor?

ANSWER
MINISTER FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND
MINISTRY OF EARTH SCIENCES
(DR. HARSH VARDHAN)

(a) In order to cater to the needs of Cyclone Warning Services and Marine weather services, there are seven established Cyclone Warning Centers covering the east & west coasts of our country. Among these, three are Area Cyclone Warning Centres (ACWCs) located at Chennai, Mumbai and Kolkata and remaining four are Cyclone Warning Centres (CWCs) located at Ahmedabad, Thiruvananthapuram, Visakhapatnam and Bhubaneswar. Area of responsibility of ACWCs and CWCs is shown in the Table below.

Centre	Coastal area*	Maritime State/UT
ACWC Kolkata	State: West Bengal UT: Andaman & Nicobar Islands	State: West Bengal UT: Andaman & Nicobar Islands
ACWC Chennai	State: Tamil Nadu UT: Puducherry	State: Tamil Nadu UT: Puducherry
ACWC Mumbai	State: Maharashtra & Goa	State: Maharashtra & Goa
CWC Thiruvananthapuram	State: Kerala & Karnataka	State: Kerala & Karnataka

	UT: Lakshadweep	UT: Lakshadweep
CWC Ahmedabad	State: Gujarat UT: Dadra-Nagar Haveli- Daman-Diu	State: Gujarat UT: Dadra-Nagar Haveli- Daman-Diu
CWC Visakhapatnam	State: Andhra Pradesh	State: Andhra Pradesh
CWC Bhubaneshwar	State: Odisha	State: Odisha

*Coastal strip of responsibility extends upto 75 km from the coast line.

(b) Yes Sir. India Meteorological Department (IMD) has developed state of art tools for cyclone warning services, and has demonstrated its capability to provide early warning for Cyclones with high precision and has earned accolades globally and nationally for very effective state of art early warning system for monitoring and prediction of cyclones. The cyclone forecast accuracy has significantly improved in recent years as has been demonstrated during cyclones Phailin (2013), Hudhud (2014), Vardah (2016), Titli (2018), Fani & Bulbul (2019) and Amphan, Nisarga & Nivar (2020). During recent years, the loss of life due to cyclone has been drastically reduced being limited to double digit figures.

(c) Further, enhancing the accuracy of weather forecasts and their more effective & timely dissemination in the ensuing years is a continuing process. For this purpose, under the Umbrella Scheme entitled 'Atmospheric & Climate Research – Modeling Observing Systems & Services (ACROSS), a sub-scheme has been planned viz., 'Upgradation of Forecast Services'. The various components of this sub-scheme include;

   (i) Development of an advanced operational forecast system
   (ii) Upgradation and sustenance of communication systems for weather services
   (iii) Capacity building & outreach etc.

This along with further improvements in the observational network and numerical modeling capability planned under ACROSS are also expected to increase the accuracy of weather forecasts.

Also, Indian National Centre for Ocean Information Services (INCOIS) has set up Storm Surge Early Warning System (SSEWS) for the Indian coasts in active collaboration with IMD. Prime objective of this service is to save the lives of coastal community by forecasting cyclone induced storm surges and inundation extent.

Further, the Government of India has initiated the National Cyclone Risk Mitigation Project (NCRMP) with a view to address cyclone risks in the country. The overall objective of the Project is to undertake suitable structural and non-structural measures to mitigate the effects

of cyclones in the coastal states and UTs of India. National Disaster Management Authority (NDMA) under the aegis of Ministry of Home Affairs (MHA) will implement this Project in coordination with participating State Governments. The Project has identified 13 cyclone prone States and Union Territories (UTs), with varying levels of vulnerability.

Under Phase–2 of the NCRMP, NDMA in collaboration with IMD has developed a web based Dynamic Composite Risk Analysis (Web-DCRA) & Decision Support System (DSS) tool for forecasting the expected damage associated with the Landfalling cyclones over the coastal districts of our country. This will enable the disaster managers for a better assessment of the vulnerable areas and in mobilizing the mitigation action based on this.

(d) - (e) INCOIS has developed a device named GEMINI (*GAGAN Enabled Mariner's Instrument for Navigation and Information*) a simple handheld device that receives the information transmitted through GAGAN and feeds that to the mobile handset through Bluetooth connection. An App developed by INCOIS converts the satellite messages in the form of readable maps and text. The decoded information can be viewed on the mobile in any of the languages spoken in the coastal states of India. The Mobile app receives the GPS information (Current Position, Satellite Date & Time) as well as the following broadcasted messages.

1. Potential Fishing Zone Advisory
2. High Wave Alert & Strong Wind Alert
3. Cyclone and Tsunami Warning Information
4. Maximum Wind Speed, Maximum Wave Height, Maximum Current Speed
5. Bathymetry, Distance & Direction

Govt. of India has made provision for such devices under the Pradhan Mantri Matsya Sampada Yojana (PMSSY) scheme. Under this scheme, support is provided to procure PFZ devises, network and cost of installation as part of "Strengthening of safety and security of fishermen".

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