

GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION No. - 973
ANSWERED ON 15/12/2022

AREA CYCLONE WARNING CENTRES

973. # SHRI NEERAJ DANGI:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the number of Area Cyclone Warning Centres (ACWCs) currently functional in the country, State-wise;
- (b) whether Government is planning to set up more ACWCs in the country, if so, the State-wise details of the areas identified; and
- (c) the details of reforms undertaken by Government to prevent cyclones and minimize the damage caused by them?

ANSWER

THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR
MINISTRY OF SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(DR. JITENDRA SINGH)

- (a) In order to cater to the needs of Cyclone Warning Services and Marine weather services, there are seven established 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 UT: Lakshadweep	State: Kerala & Karnataka 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)&(c) IMD has demonstrated its capability to provide early warning for Cyclones with high precision. As a result, the vulnerable population gets evacuated from the damage prone areas in a timely manner to safe shelters thereby reducing the human death toll to a bare minimum, in the recent years. It is noteworthy that death due to cyclones has been reduced to less than 100 in recent years.

IMD has continuously expanded its infrastructure for meteorological observations, data exchange, monitoring & analysis, forecasting and warning services using contemporary technology. IMD uses a suite of quality observations from Satellites, Radars and conventional & automatic weather stations for monitoring of cyclones developing over the Bay of Bengal and Arabian Sea. It includes INSAT 3D and 3DR satellites, Doppler Weather Radars (DWRs) along the coast and coastal automated weather stations (AWS), high wind speed recorders, automatic rain gauges (ARGs), meteorological buoys and ships.

IMD has a very effective Decision Support System for analyzing various observations at a single platform and predicting track and intensity of cyclones as well as the adverse weather like heavy rain and wind. IMD also utilizes storm surge and coastal inundation models and wave models output from Indian National Centre for Ocean Information Services (INCOIS), Hyderabad for issuing storm surge warning.

IMD has a well-defined Standard Operation Procedure for monitoring & forecasting the cyclones and issue related warning.

IMD maintains round the clock watch over the north Indian Ocean and provides information about the convective activity over the region and probability of cyclogenesis. On formation of cyclonic disturbance (wind speed 31.5 kmph and above), structured bulletins are issued as per Standard Operating Procedure containing information about the current status of system (including location, movement, intensity) and forecast track, intensity, landfall point, associated adverse weather (heavy rainfall, gale wind, storm surge), state of Sea, fishermen warning, damage expected and action suggested. In addition IMD also provides advisories for sea area, coastal area, port warnings, fishermen warnings through its regional offices. IMD also provide sector specific services for marine community including fishermen, power sector, offshore operations etc.

IMD utilizes all means of transmission (conventional and modern) to disseminate warnings and advisories. IMD has dedicated website for tropical cyclones. IMD has also developed API's (Application Programming Interface) that allows seamless flow of data between two agencies), crowd sourcing interface to get realtime observations from general public for validation of forecast, transmission of advisories through SMS, WhatsApp, facebook, tweeter, common alerting protocol etc.

Various steps have been taken to improve product generation, presentation and dissemination, which could enhance the users' response for effective cyclone disaster management.

Cyclone warnings are disseminated to various users through telephone, fax, email SMS, Global Telecom System (GTS), All India Radio, Television and other print & electronic media. These warnings/advisories are also put in the newly launched in 2014 dedicated website (www.rsmcnewdelhi.imd.gov.in) of IMD for cyclone purpose. Another means to transmit warning is IVRS (Interactive Voice Response system). The requests for weather information and forecasts from general public are automatically answered by this system through a toll-free number. Short warning message as SMS and the whole warning message as email are sent IMD HQ and different Cyclone Warning Centres in the country. Any person in the country can get free SMS warning by registering through RSMC, New Delhi website. Local weather warnings are put in IMD website for common people.

The **observed and forecast track and intensity along with the quadrant wind forecasts** of the cyclone are updated in RSMC, New Delhi **website** time to time, based on the tropical cyclone advisory bulletin issued by Cyclone Warning Division of IMD, New Delhi.

IMD is providing cyclone forecasting products in Web-GIS platform. Dynamic impact based forecast of cyclone will be provided with the commissioning of Web-DCRA being developed by NDMA in collaboration of State Governments, IMD & INCOIS.

In case of cyclone forecast, to support the Disaster Management Authorities, there are continuous efforts towards vulnerability assessment & resilience building related to cyclones. Towards this, the Government of India (GoI) 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. The Project has identified 13 cyclone prone States and Union Territories (UTs), with varying levels of vulnerability.

The Cyclone Warning Division (CWD) at IMD, New Delhi also acts as a Regional Specialised Meteorological Centre for monitoring, predicting and issuing warning services on tropical cyclones developing over north Indian Ocean (**one of the sixth centre in the World**) along with 13 countries in Bay of Bengal and Arabian Sea region. The collaboration helped in exchange of meteorological data from Bay of Bengal (BoB) and Arabian Sea countries to IMD and hence improved monitoring and forecast. On the other hand the meteorological data of satellite & radar support and model guidance from IMD along with Tropical Cyclone Advisory Bulletins helped the countries to minimize the losses of lives.
