

GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION NO. - 982
ANSWERED ON – 10/02/2022

PREPARATION FOR THREATS OF EXTREME WEATHER EVENTS

982. SHRI N.R. ELANGO:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether Government is aware that technological advancements, along with better mitigation and adaptation measures, streamlining of disaster management in development policies and improving last mile delivery systems are some of the important ways to prepare for the inevitable incoming threats of extreme weather events and disasters in the coming years;
- (b) if so, the steps that have been taken so far by Government in this regard; and
- (c) the steps taken by Government to protect the flora & fauna of their habitational places?

ANSWER

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

- (a)- (b) Yes Sir. India Meteorological Department (IMD) issues forecast and warnings for severe weather elements to support disaster management and mitigation measures. For this purpose IMD follows a seamless forecasting strategy. The long-range forecasts (for the whole season) issued are being followed with extended range forecast issued on every Thursday with a validity period of four weeks. To follow up the extended range forecast, IMD issues short to medium range forecast and warnings at 36 meteorological subdivisions levels daily four times valid up to next five days with an outlook for subsequent two days. The short to medium range forecast and warning at district and station level are issued by state level Meteorological Centres (MCs)/Regional Meteorological Centres (RMCs) with a validity of next five days and are updated twice a day. The short to medium range forecast is followed by very short range forecast of severe weather up to three hours (nowcast) for all the districts and 1089 cities and towns. These nowcasts are updated every three hours.

While issuing the warning suitable colour code is used to bring out the impact of the severe weather expected and to signal the Disaster Management about the course of action to be taken with respect to impending disaster weather event. Green color corresponds to no warning hence no action is needed, yellow color corresponds to be watchful and get updated information, orange color to be alert and be prepared to take action whereas red color signals to take action.

IMD is issuing Impact Based Forecast (IBF) which give details of what the weather will do rather than what the weather will be. It contains the details of impacts expected from the severe weather elements and guidelines to general public about do's and don'ts while getting exposed to severe weather. These guidelines are finalised in collaboration with National Disaster Management Authority (NDMA) and is already implemented successfully for cyclone, heat wave, thunderstorm and heavy rainfall.

Technologies used to provide above forecasts and warnings are as follows.

- The observational network of the department has been enhanced with installation of more number of Automatic Weather Stations (AWSs) and Automatic Raingauges (ARGs) across the country.
- 33 Doppler Weather Radars are operational across the country to provide adequate warning in the event of approach of Cyclonic Storms, Monsoon Depressions, Thunderstorms etc. DWR network also provides vital information for nowcasting purposes on mesoscale convective weather developments anywhere in the country.
- Multi-Mission Meteorological Data Receiving & Processing System has been established and dedicated to the nation for augmentation of satellite derived products.
- New raingauge stations are being added in the District-wise Rainfall Monitoring Scheme to increase the rainfall monitoring network.
- Location specific forecast for 7 days and nowcast for next 3 hours have been extended to 1164 and 1089 stations respectively covering 739 districts in the country.
- Six Global and regional numerical weather prediction (NWP) models are run by MoES daily twice to provide the forecast and warning at station, Block, district and meteorological sub-divisions levels upto seven days. Sector specific modelling is also carried out for forecasting with respect to agriculture, cyclone, riverine flood, flash flood and urban flood, thunderstorm/lightning etc.
- The NWP Model based gridded rainfall data are provided to Central Water Commission for their flood forecasting model for all 153 river catchments and Extended Range model products for 10 river basins.
- With operationalization of Flash Flood Guidance system, generation and issue of Flash Flood Guidance has commenced for all watersheds of the country.
- Urban flood warning system has been developed for Mumbai and Chennai.
- Common Alert Protocol (CAP) has been implemented as per WMO standard for severe weather warning. It is being utilized for Global Multi-Hazard Alert System of WMO.
- The multi-model ensemble (MME) based Extended range prediction system and long range forecasting system have been developed and implemented in IMD.

Regarding dissemination of weather forecasts and warnings, IMD is always in a continuous process of improvement. At present the forecasts and warnings are broadcasted or disseminated to users including disaster managers by e-mail on regular basis. In addition to this, WhatsApp groups are created including disaster managers and IMD officials through which these forecasts & warnings are disseminated. The forecasts & warnings are uploaded in social media & website for reference by all concerned. The nowcasts related to Severe Weathers are also disseminated through SMS to the registered users. In addition to this, as and when the situation arises, Press Releases are issued by IMD and the same is also disseminated by all the platforms mentioned above.

IMD has launched seven of its services (Current Weather, Nowcast, City Forecast, Rainfall Information, Tourism Forecast, Warnings and Cyclone) with 'UMANG' mobile App for use by public. Moreover, IMD had developed mobile App 'MAUSAM' for weather forecasting, 'Meghdoot' for Agromet advisory dissemination and 'Damini' for lightning alert. The common Alert Protocol (CAP) developed by NDMA is also being implemented for dissemination of warning by IMD.

Moreover, various new initiatives are being undertaken by MoES for betterment of prediction and dissemination of warnings of extreme weather events that may cause natural disasters.

- (c) Ministry of Earth Sciences (MoES), does not have the mandate to protect the flora & fauna of their habitational places. However, the Centre for Marine Living Resources & Ecology (CMLRE), Cochin under MoES, is the National facility responsible for undertaking R & D activities in the country which inter-alia include mapping of the marine living resources, to strengthen the knowledge base on the complex interactions in the marine ecosystems of the seas around India and vulnerable ecosystems in the Indian jurisdiction, to enable the policy makers and managers to derive strategies for the optimum and effective utilization through ecosystem management on Marine Living Resources and Ecology. The Marine Living Resources (MLR) Programme envisages survey, assessment and exploitation of the MLR and studies on the response of MLR to changes in the physical environment with the objective of developing an ecosystem model for the management of the living resources in the Indian EEZ. The Fishery Oceanographic Research Vessel (FORV) Sagar Sampada is fully utilized for these studies in addition to the information from other sources viz; satellite remote sensing, Modelling outputs, Argo profiles and Buoy data. On-going MLR activities focus on Inventorying the Marine Biodiversity with ancillary environmental parameters, understanding the ecosystem process that governs the biology and biogeochemistry of the ecosystems.
