

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION No. 172
TO BE ANSWERED ON THURSDAY, FEBRUARY 25, 2016**

ADVANCEMENT IN PREDICTING NATURAL CALAMITIES

172. DR. V. MAITREYAN:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether Government has chalked any new initiatives aimed to bring in scientific and technological advancement in predicting natural calamities like earthquake, floods & cyclones, abnormal weather, unseasonal rains etc., if so, the details thereof;**
- (b) the details of countries and Government agencies abroad who have signed MoU with India for providing technological support in this regard;**
- (c) the priority sectors earmarked for the next three years while strengthening the India agro based industries, maritime trade and transport and coastal security; and**
- (d) the roles and responsibilities and the other stake-holders in this regard?**

ANSWER

**MINISTER OF STATE FOR MINISTRY OF SCIENCE AND TECHNOLOGY AND
MINISTRY OF EARTH SCIENCES
(SHRI Y. S. CHOWDARY)**

- (a)-(b) Yes Sir. Earth System Science Organization (ESSO) -India Meteorological Department (IMD) is responsible for monitoring, detection and forecasting of weather and climate extremes including severe weather events such as cyclones, heavy rainfall, extreme temperature etc. Such forecasts are issued at national, regional and state levels. In order to provide early warning of severe weather events, ESSO-IMD has setup a network of state meteorological centres to have better coordination with a state and district level agencies.**

Monitoring of the seasonal (monthly / weekly rainfall scenario with reference to respective normal (mean value) is only carried out by ESSO-IMD to regularly assess and identify zones of deficit rainfall leading to drought conditions, the declaration of which remains with the mandate of Ministry of Agriculture in consultation with various state governments. Performance of Numerical Weather Prediction (NWP) models have improved considerably due to large scale integration of local data & global & satellite information for ultimately improving severe weather forecasts.

In order to meet specific requirements of flood forecasting which is provided by central water commission, ESSO-IMD operates Flood Meteorological Offices (FMOs) at ten locations viz., Agra, Ahmedabad, Asansol, Bhubaneswar, Guwahati, Hyderabad, Jalpaiguri, Lucknow, New Delhi and Patna. During the flood season, FMOs provide valuable meteorological support to the Central Water Commission (CWC) for issuing flood warnings in respect of the 43 rivers of India. CWC is working in close association with IMD and State Governments for timely flood forecast whenever the river water level rises above warning level. To meet the requirement of State Governments, ESSO-IMD Officers invariably attend all the meetings called by the State Governments for reviewing the preparedness on floods by various agencies.

ESSO-National Center for Seismology (NCS) is monitoring earthquake activity in and around the country round the clock through its national seismological network along with other global/regional seismicity monitoring networks.

ESSO-IMD and ESSO-NCS have existing mechanism to coordinate with various state authorities. As such ESSO-IMD provide inputs to State Crop Weather Watch Group, State Disaster Management Authorities, Relief Commissioners. During cyclones a coordination mechanism with district authorities has also been established. Round the clock weather surveillance and forecasting system is operational at ESSO-IMD for continued monitoring, detection and warning of Cyclones; river basin scale meteorological support (monitoring and warning) for CWCs river flood warning system and other severe weather systems. Operational forewarning systems are already in place by the CWC for river basin scale flood. Fully organized protocol exists between ESSO-IMD, CWC and with the various designated disaster management authorities at centre and state levels for dissemination of weather forecasts and warning alerts.

The Indian Tsunami Early Warning Centre (ITEWC) has all necessary infrastructure and capabilities to give tsunami advisories to India as well as to Indian Ocean countries. ITEWS has been designated as one of the Regional Tsunami Service Providers for the entire Indian Ocean Region by the Intergovernmental Oceanographic Commission (IOC) of UNESCO on 12 October 2011. Since then, ITEWC is providing tsunami warnings and related services to all countries in the Indian Ocean Rim (24 Countries) beyond fully serving the India's coastline / Islands. The centre is capable of detecting tsunamigenic earthquakes occurring in the Indian Ocean as well as in the Global Oceans within 10 minutes of their occurrence and disseminates the advisories to the concerned authorities within 20 minutes through email, fax, SMS, GTS and website.

(c)-(d) The Indian Tsunami Early Warning Centre has been completely developed indigenously without any external scientific or technical assistance. This centre is recognized as one of the best warning centres in the world. However ESSO had signed MoU with National Oceanic and Atmospheric Administration (NOAA), USA for improving monsoon rainfall and tropical cyclone/ season weather phenomena.

The Gramin Krishi Mausam Seva (GKMS) of ESSO-IMD has been successful in providing the crop specific advisories to the farmers at the district level twice weekly through different print/visual/Radio/ IT based wider dissemination media including short message service (SMS) and Integrated Voice Response System (IVRS).Further Research efforts are initiated by ESSO -IMD to explore possibility of generating sub district scale Agro-meteorological forecast with acceptable level of verification skill in a pilot mode.

For the benefit of fisherman community, a customized application for the fishermen community of the country, called "Potential Fishing Zone (PFZ) Advisories", is operated successfully since 1999 useful for guiding the fishermen about locations of high fish grounds/aggregation/catch . In addition, the Ocean State Forecast (OSF) (wave height and direction, wind speed and direction, ocean currents, sea surface temperature, depth of mixed layer and thermo cline, sea level at major and minor ports, etc. is also provided to fisherman to have full idea of the associated ocean state conditions in those identified PFZs.

Under the National Monsoon Mission initiative institutions of ESSO, the Indian Institute of Tropical Meteorology (ESSO-IITM), Pune, Indian National Centre for Ocean Information Services (ESSO-INCOIS), Hyderabad and National Centre for Medium Range Weather Forecasting (ESSO-NCMRWF), NOIDA, have embarked upon to build a state- of-the-art coupled ocean-atmospheric climate models for quantitatively improved operational services of ESSO-IMD.

Coordination with Ministry of Water Resources, Ministry of Agriculture, Ministry of Civil Aviation, Directorate of Meteorology, Indian Air Force and Directorate of Naval Oceanography and Meteorology, Indian Navy, Ministry of Home Affairs, Coast Guard are the partners dealing in organizing emergency response and relief operations during disastrous situations.

The responsibility of coastal security lies primarily with Indian Coast Guard (ICG) and Indian Navy.
