

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION No. 1482
TO BE ANSWERED ON MONDAY, DECEMBER 24, 2018**

CYCLONE FORECASTING SYSTEM

1482 SHRI G. C. CHANDRASHEKHAR:

Will the Minister of EARTH SCIENCES be pleased to state

- (a) whether cyclone 'Titli' and 'Gaja' wrecked havoc across various States resulting in loss of lives and properties, if so, the details thereof;**
- (b) whether Government has taken any new initiatives to bring in technological advancement in cyclone forecasting system and if so, the details thereof including international cooperation/agreement; and**
- (c) other steps taken by Government to develop cyclone forecasting and management system in the country?**

ANSWER

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

- (a) Yes Sir. Authentic details of death and damage caused by cyclones Titli and Gaja are not available with IMD.**
- (b) One of the most important initiatives has been to improve the weather modelling capability for forecasting cyclones. In addition to in-house efforts, collaborative efforts with Academic and R&D Institutes to improve early warning services have been taken up. A few notable initiatives taken up in recent years are as follows:**
 - Bilateral agreement with NOAA, USA and UK Met. Office for improvement in numerical weather prediction (NWP) modelling w.r.t. global forecast system and Unified Model (UM) respectively. This collaboration has led to implementation of the deterministic and ensemble prediction systems (EPS) for probabilistic forecast based on Global Ensemble Forecasting System (GEFS) and UM-EPS.**
 - A bilateral collaboration between India and United States involving National Centre for Environment Prediction (NCEP), USA, IMD, Indian National Centre for Ocean Information Services (INCOIS), Indian Institute of Technology (IIT) Bhubaneswar has resulted in experimental implementation of high resolution of Ocean Atmosphere Coupled Model viz. Hurricane Weather Research & Forecast (HWRF) Model for north Indian Ocean with a resolution of 2,6,18 km.**

- **IMD and ISRO continuously collaborate to develop various satellite based observational products to improve the early warning services of cyclones. It includes development of cyclone specific images and products, analytical tools like Advanced Dvorak Technique and RAPID software.**
- **The Monsoon Mission Project of the Ministry is a multi-institutional initiative involving many academic & R&D institutes nationally and internationally to improve monsoon forecast in various space and time scales.**
- **Round the clock Forecast Demonstration Project (FDP) is taken up to improve forecast and warning services with respect to Cyclones during Oct-Dec.**

(c) IMD has one of the best forecasting systems for predicting tropical cyclones using high resolution advanced mathematical models and a suite of quality observations from Satellites and Radars. IMD utilises an array of high resolution advanced mathematical models (including global, regional and cyclone specific models) and a suite of quality observations from Satellites, Radars and conventional & automatic weather stations for monitoring & predicting tropical cyclones crossing both west and east coast of India. IMD has a very effective Decision Support System for generating track of cyclones and analysing various observations at a single platform. IMD has defined Standard Operating Procedure for monitoring & forecasting the cyclones and issue of warning services.

IMD continuously expands its infrastructure for meteorological observations, data exchange, monitoring & analysis, forecasting and weather services. IMD has always used contemporary technology and is in process of further expanding it's observational network and computational abilities.
