

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 4473
TO BE ANSWERED ON WEDNESDAY, DECEMBER 14, 2016
STUDY OF WEATHER PATTERN**

4473. SHRI RAJU SHETTY:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the scientists have been sent abroad to better understand and study the weather pattern in the country during the last three years and the current year; and**
- (b) if so, the details thereof including the funds spent by the Government and the benefits achieved as a result thereon?**

ANSWER

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

- (a) Yes Madam.**
- (b) During the last 3 years, 19 Scientists (5 from Indian Institute of Tropical Meteorology (IITM), 3 from (Indian National Centre for Ocean Information Services) INCOIS and 2 from National Centre for Medium Range Weather Forecasting (NCMRWF) and 9 from India Meteorological Department (IMD) have been deputed abroad for training and collaborative work under the National Monsoon Mission and other programs of the Ministry of Earth Sciences (MoES). The funds spent on for these deputations are INR 1, 79, 62,623.**

The benefits accrued from these deputations for research & development in the field of Atmospheric & ocean sciences, both on weather and climate time scales are listed below;

- Development and implementation of a coupled ocean-atmosphere data assimilation system for the Climate Forecast System (CFS) model which will be very useful for operational monsoon prediction activities.**
- Development of Extended range prediction system for predicting active and break spells (ERPAS) of Indian summer monsoon rainfall, with significant prediction skill.**
- 2C-ICE (Combined radar and lidar ice-cloud products) and DARDAR (another RADAR & LIDAR combined products for ice cloud) satellite data products have been retrieved and analysed using advanced algorithms and variational techniques of data assimilation.**
- Development of Earth System model (ESM) for climate change prediction at Centre for Climate Change Research (CCCR), IITM, Pune.**
- Assimilation of Indian satellite data in the data assimilation system. Use of radar data for studying small scale processes in the Indian monsoon and verification of high resolution model forecasts.**
- Implementation of an ocean data assimilation system at NCMRWF.**
- Use of quantitative rainfall forecast for hydrological/flood forecasting.**
- A major benefit of these visits is the development of strong scientific and technical capability in India in the areas of atmosphere-ocean coupled modeling which is essential for advancing the skill of forecasting weather and climate, including monsoon rainfall over the country.**
