

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 2037
TO BE ANSWERED ON WEDNESDAY, MARCH 07, 2018**

EARTH SCIENCE PROJECTS

2037. SHRIMATI RITI PATHAK:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the State/UT-wise details of Earth Sciences schemes/projects implemented or under implementation by the Government during each of the last three years and the current year;**
- (b) the State/UT-wise details of funds sanctioned/allocated/utilized under such schemes during the said period;**
- (c) the progress made under such schemes during the said period;**
- (d) whether the Government is satisfied with the achievements made under such schemes; and**
- (e) if not, the reasons therefor and the remedial action taken by the Government in this regard?**

ANSWER

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

- (a) Madam, the mandate of the Ministry of Earth Sciences (MoES) is to provide services for weather, climate, ocean and coastal state, hydrology, seismology and natural hazards; to explore marine living and non-living resources in a sustainable way and to explore the three polar regions (Arctic, Antarctic and Himalayas). To achieve this mandate, the research & development and operational activities of MoES are carried out under the following five major programs:**

- 1. Atmosphere and Climate Research – Modelling, Observing Systems and Services (ACROSS).**
- 2. Ocean Services, Technology, Observations, Resources, Modelling and Science (OSTORMS).**
- 3. Polar and Cryosphere Research (PACER).**
- 4. Seismology and Geosciences (SAGE).**
- 5. Research, Education, Outreach and Training (REACHOUT)**

The above schemes are central sector schemes. They are for the entire country and not specific to any State/UT.

- (b) **The details of the funds utilised under these schemes during the last three years are given in Annexure-I.**
- (c) **The progress made under these schemes during the above period is as follows:**

(i) ACROSS:

- **Augmentation of surface and upper air observational network and Doppler Weather Radar (DWR) Network.**
- **Establishment of High Performance Computing System with 6.8 Petaflop speed to meet the modelling requirements.**
- **Under the National Monsoon Mission, a high resolution global deterministic weather prediction model has been commissioned for generating operational weather forecasts at short, medium, monthly and seasonal timescales. Noteworthy improvement was made in track and intensity forecast of the tropical cyclones, and skills of Heavy Rainfall Forecasts**
- **Expansion of Agro-meteorological Advisory Services. At present about 22.7 millions farmers receive these weather forecast and agromet advisories directly by SMS.**
- **The System of Air Quality and Weather Forecasting And Research (SAFAR) system has been developed and deployed at Delhi, Pune, Mumbai and Ahmedabad.**

ii) OSTORMS:

- **Augmentation of Ocean Observing Systems in the Indian Ocean through national and international efforts.**
- **Provided a suite of advisory services on 24x7 basis, such as Tsunami early warning, Potential Fishing Zone, Ocean State forecast, coral bleach alert to cater to various sectors.**
- **The Ocean State Forecast service has been extended for neighbouring countries.**
- **Operationalization of International Training Centre for Operational Oceanography at Hyderabad, which has been recent upgraded to UNESCO Category-2 Centre (C2C).**
- **Indigenously developed 500 m depth rated shallow water/Polar Remotely Operated Vehicle (PROVe). It was successfully deployed in the Andaman coral Islands and the vehicle was successfully maneuvered in the undulating reef terrain to record high quality underwater visuals of coral reef biodiversity with spectral irradiance.**
- **Developed backward bent ducted buoy to generate power from sea waves, drifter buoy, deep ocean bottom pressure recorder, and autonomous passive acoustic monitoring system.**
- **Beach nourishment technique was demonstrated at Puducherry coast leading to gain of 60 m wide beach.**

iii) PACER:

- **Established a high altitude research station in Himalaya called HIMANSH at a remote region in Spiti, Himachal Pradesh.**
- **Deployed India's first multi-sensor moored sub-surface observatory (IndARC) at a water depth of ~180 m in the Arctic. India has been accorded the Observer status in the Arctic Council in recognition of her scientific contributions endeavours in Polar research.**
- **Indian Scientific expeditions to Antarctica were launched and executed successfully.**
- **Research studies were carried out on variability of cryosphere using remote sensed data, southern Indian Ocean and past climate and oceanic variability of polar regions.**

iv) SAGE :

- **Setting up of the National Centre for Seismology (NCS) at New Delhi to provide added thrust to seismological services in the country. NCS now has 102 national observatories with real time data streaming through VSAT connectivity.**
- **For automatic earthquake parameter dissemination, IndiaQuake, a mobile App was developed and launched.**
- **The Scientific Deep Drilling Project at Koyna, Maharashtra started in 2016 with the aim of setting up of borehole observatory at 3.0 to 5.0 km depths for directly measuring parameters in the near field of earthquakes - before, during and after their occurrence.**
- **In order to undertake micro-zonation, studies of 30 selected cities, falling in seismic zone V, IV, III and State Capitals has been initiated. As a part of this exercise, Micro-zonation of Delhi has been completed based on Probabilistic Seismic Hazard Analysis (PSHA).**

v) REACHOUT :

- **Under this program, Ministry has supported about 60 focused research projects in the area of Atmospheric Science and Geoscience during the last 3 years and current year. As human resource development and capacity building, the ministry has supported M.Sc/ M.Tech/Ph.D. programmes at various Universities and IITs.**
- **During the last three years, MoES has also supported about 300 seminars, workshops, etc. in the area relevant to its mandate.**
- **Successful international cooperation with different countries for collaborative research and human resources development.**

- **Regional leadership through Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), and International Training Centre for Operational Oceanography (ITCO ocean).**

(d) Yes.

(e) Not Applicable.

Annexure-I

No.	Schemes	2015-16 Actuals (in Crores)	2016-17 Actuals (in Crores)	2017-18 R.E. (in Crores)
1.	ACROSS	278.87	394.60	423.00
2.	O-STORMS	279.70	305.54	326.00
3.	PACER	118.66	114.74	127.00
4.	SAGE	117.78	51.04	88.82
5.	REACHOUT	60.99	36.27	46.00