

**GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION No. 3426
TO BE ANSWERED ON MARCH 13, 2020**

FUNDS FOR EARTH SCIENCE ACTIVITIES

3426. SHRI DIPSINH SHANKARSINH RATHOD:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether the Government has allocated funds for earth science activities in 2020-21; and**
- (b) if so, the details thereof along with activities undertaken/proposed to be undertaken in this regard?**

ANSWER

**MINISTER FOR SCIENCE AND TECHNOLOGY
AND EARTH SCIENCES
(Dr. HARSH VARDHAN)**

- (a) Yes Sir. The research & development and operational (service) activities of the Ministry of Earth Sciences (MoES) are carried out under the following five major central sector umbrella schemes:**
 - 1. Atmosphere and Climate Research – Modelling, Observing Systems and Services (ACROSS)**
 - 2. Ocean Services, Modelling, Application, Resources and Technology (O-SMART)**
 - 3. Polar and Cryosphere Research (PACER)**
 - 4. Seismology and Geosciences (SAGE)**
 - 5. Research, Education, Outreach and Training (REACHOUT)**

The activities under these schemes are being implemented by ten organizations under MoES which also include 5 autonomous bodies. The total budget allocated for the year 2020-21 is given in Annexure-I.

- (b) Ministry has undertaken following activities during 2017-20:**
 - Augmentation of Atmospheric, Ocean and Seismological Observing Systems.**
 - Augmentation of High Performance computer facility (HPC).**
 - Development of state of the art Data Assimilation System and Models for Atmosphere and Oceans**
 - Development of world class services of weather, climate, ocean state, coastal, earthquakes and other natural hazards**
 - Launch of the second phase of Monsoon Mission**

- **Science of Climate Change and Regional Climate Change Scenarios.**
- **Instrumented Aircraft System for atmospheric studies.**
- **Development of research test beds and Climate Reference Stations**
- **Development of technology for integrated Deep Sea Mining System and manned submersible, desalination plants.**
- **Deep bore hole study at Karad, Maharashtra.**
- **Seismic Microzonation of selected cities.**
- **Exploration of the Polar regions**
- **Support proposals from various academic/research organizations and universities in the different fields of Earth system, Create awareness amongst the public, students, academicians and user communities about the various fields of Earth System Sciences**
- **Develop skilled and trained manpower in Earth Sciences**

Activities proposed to be undertaken during the year 2020-21 under different schemes are:

ACROSS

- **Installation and commissioning of Doppler Weather Radars (DWRs) over NW Himalayas, Automated Weather Observing System (AWOS) and Automatic Weather stations (AWS) for agromet weather services, tourism forecasts and some cities/schools.**
- **Establishment of state-of the-art climate data centre with integrated advanced climate data services portal for rendering national and regional climate services**
- **Research and Development in Global/Regional Modelling and Data Assimilation**
- **Development of new applications of global ensemble prediction system for the generation of probabilistic forecasts.**
- **Agro-meteorological advisory Services at block level and setting up District Agro Met Units (DAMU)**
- **Implementation of Urban flood forecast system for Mumbai and establishment of a meso network at Mumbai city.**
- **Completion of the CMIP (Coupled Model Intercomparison Project) simulations.**
- **Infrastructure development at the Research testbed site in Bhopal**
- **Preparation of strategic document for HPC upgradation.**
- **Strengthening of atmospheric observational network over NE India**
- **Initiation of Urban Meteorology and Weather Modification projects**

- **Completion of the technical and financial evaluation of the RFP and finalisation of the supplier of Instrumented Aircraft System**

O-SMART

- **Launching of the new program on Deep Ocean Mission with Rs. 6687.5Crores for next five years. EFC document has been submitted to Ministry of Finance for approval and conducting the EFC meeting. Inter-ministerial consultations have been completed.**
- **Augmentation in the number of Ocean observation systems as a part of the multi-hazard warning system**
- **Installation of two buoys at Vishakhapatnam and Kochi for costal water monitoring**
- **Increase in the number of locations for monitoring of coastal pollution from 24 to 35**
- **Initiate ecosystem-based species-specific potential fishing zone advisories and forecasts**
- **Level-3 tsunami advisories that includes the coastal inundation along the Indian coasts**
- **Special observations to measure the air-sea fluxes and physical and biogeochemical parameters.**
- **Increase in the Area covered under bathymetric data acquisition in exclusive economic zone of India (sq. km.)**
- **Installation and commissioning of six desalination plants in Lakshadweep islands, each with a capacity to produce 1.5 lakh litres of water every day**
- **Conducting biogeochemistry studies on the west coast of India**
- **Research and Development in Ocean Modelling and Data Assimilation**
- **Biodiversity inventorisation within the Indian EEZ including deep-sea ecosystems of northern Indian Ocean**
- **Creation of a comprehensive marine geo-scientific Database, which shall form the nucleus of many future scientific and exploration, programmes in the Indian Ocean realm.**
- **Monitoring of shoreline changes for coastal states and identification of erosion hotspots**
- **Initiation of work on the Estimation of marine litter and microplastics**
- **Initiation of development of manned submersible by NIOT.**

PACER

- **Launch of 14th Scientific expedition to the Arctic.**
- **Launch of 40th scientific expedition to the Antarctic**
- **Scientific expeditions to Himalayas**
- **Launch of Multi-disciplinary inter-institutional scientific expedition to Southern Ocean.**

- **Tendering process for procurement of Polar Research Vessel (PRV)**

SAGE

- **Capacity augmentation for seismological observations. It is proposed to increase the number of seismological observatories to 125 in 2020-21.**
- **Investigations related to microzonation of 4 cities namely, Chennai, Bhubaneswar, Mangalore, Coimbatore (expected to be completed by the end of 2020-21). Additionally, microzonation of 8 more cities, namely, Kanpur, Lucknow, Patna, Dhanbad, Varanasi, Meerut, Agra, Amritsar to be initiated.**
- **As a part of setting up of a national facility for Geochronology, operationalization of one of the major equipment i.e. HR-SIMS and initiate procurement of another major equipments i.e. AMS.**
- **Data acquisition and analysis to investigate Indian Ocean Geoid Low (IOGL).**
- **Participation of Indian scientists in upcoming International Ocean Discovery Program (IODP) expeditions.**
- **Setting up of Core Repository, Geological and Rock Mechanics laboratory facilities at BGRL.**
- **Instrumentation of the Koyna Pilot Borehole and associated surface instruments.**
- **Crust and mantle structures and geodynamic modelling for the evolution of peninsular India.**
- **Establishment of Geomagnetic observatory at National Centre for Earth Science Studies(NCESS).**
- **Investigation of Active faults in Southern India.**
- **Critical Zone studies of selected watersheds in Peninsular India. Develop the Attapadi, Munnar and Cauvery Delta Critical Zone Observatories for monitoring key Critical Zone variables.**

REACHOUT

- **Providing extramural funding to about 50 proposals funded for undertaking R&D activities in various academic and research institutes of the country.**
- **Providing extramural funding to about 50 conferences/seminars/and symposium**
- **Conduct training courses under the DESK and ITCOcean programs at IITM and INCOIS respectively.**
- **Delivery of forecast products and Capacity building for BIMSTEC Member countries**
- **Commissioning of MoES Knowledge Resource Center Network (KRCNet)**
- **Development of an Earth Science Data Portal for sharing data of Earth system science.**

Annexure-I

Sl. No.	Name of the Scheme	Major Head	Budget Estimates 2020-21
(A) Central Sector Schemes			
1	Ocean Services Technology Observations Resources Modelling and Sciences (O-SMART)	3403 (Revenue)	550.00
		5403 (Capital)	17.00
2	Polar Sciences & Cryosphere (PACER)	3403 (Revenue)	125.00
3	Research Education and Training Outreach (REACHOUT)	3425 (Revenue)	85.00
4	Atmosphere & Climate Research-Modelling Observing Systems & Services (ACROSS)	3455 (Revenue)	310.00
		5455 (Capital)	130.00
5	Seismological & Geosciences (SAGE)	3455 (Revenue)	95.00
		5455 (Capital)	25.00
Total (A)			1337.00
(B) Autonomous Bodies			
1	Indian National Centre for Ocean Information Services (INCOIS)	3403 (Revenue)	26.50
2	National Institute of Ocean Technology (NIOT)		51.51
3	National Centre for Polar and Ocean Research (NCPOR)		24.79
4	Indian Institute of Tropical Meteorology (IITM)	3455 (Revenue)	78.00
5	National Centre for Earth Science Studies (NCESS)		21.00
Total (B)			201.80
(C) Establishment Expenditure of the Centre			
1	Oceanographic Survey (ORV & FORV) and Marine Living Resources (MLR)	3403 (Revenue)	35.00
2	National Centre for Medium Range Weather Forecasting (NCMRWF)	3425 (Revenue)	13.20
3	Secretariat Economic Services – MoES (HQ)	3451 (Revenue)	35.00
4	Secretariat Economic Services – DAO		9.00
5	Meteorology (IMD)	3455 (Revenue)	439.00
Total (C)			531.20
Total (A+B+C)			2070.00