

GOVERNMENT OF INDIA  
MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

**LOK SABHA**  
**STARRED QUESTION NO. 271**  
TO BE ANSWERED ON 06.08.2021

**Research on Climate Change**

\*271. SHRI DILIP SAIKIA:  
SHRI RAMESH CHANDER KAUSHIK:

Will the Minister of ENVIRONMENT, FOREST AND CLIMATE CHANGE be pleased to state:

- (a) whether the Government is providing financial support for research on climate change;
- (b) if so, the details of financial support provided by the Government during the period from 2015 to 2021, year-wise; and
- (c) the number of research papers funded as well as undertaken by the Government which were published during the last five years?

**ANSWER**

**MINISTER FOR ENVIRONMENT, FOREST AND CLIMATE CHANGE**  
**(SHRI BHUPENDER YADAV)**

(a) to (c): A Statement is laid on the Table of the House.

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**Statement referred to in reply to part (a) to (c) of Lok Sabha Starred Question No. 271 due for the reply on 06.08.2021 by SHRI DILIP SAIKIA and SHRI RAMESH CHANDER KAUSHIK regarding Research on Climate Change.**

(a) and (b) The Government stands committed to addressing the global collective action problem of climate change through multilateralism and resolute domestic actions, including, improving the understanding of the subject through various research endeavours. The Government is fully aware that research and knowledge generation are critical aspects of the fight against climate change.

Climate change is a cross-cutting issue spanning various Ministries/ Departments and institutions under them. Research on climate change is mainly sponsored by the Department of Science and Technology, Ministry of Earth Sciences (MoES), Ministry of Environment, Forest and Climate Change, Indian Space Research Organisation (ISRO), Ministry of Agriculture and Farmers Welfare, and Council of Scientific and Industrial Research. Sectoral aspects of climate change are also studied by different Ministries/Departments concerning sectors like agriculture, water resources, human health, power, renewable energy, transport, urban, etc. Further, a large number of Universities and government research institutions such as the Indian Institute of Technologies (IITs), Indian Institute of Science (IISc), Central and State Universities and their departments also carry out climate change related research. Thus, any estimate of the funds provided for climate change research for a vast developing country like India can only be indicative and not exhaustive. The details of the financial support provided by the Government for some important climate change research endeavours are in **Annexure**.

(c) Indian Scientists are making tremendous efforts to understand various facets of climate change through research activities. As an illustrative example, during the last five years, over 1500 research papers related to climate change have been published under research sponsored by the Ministry of Science and Technology, 482 research papers under research in the National Innovations in Climate Resilient Agriculture (NICRA), 270 research papers under MoES and 42 papers by the Indian Council of Forestry Research and Education (ICFRE). Furthermore, India Meteorological Department (IMD) brings out publications on Climatological Normals, State Climatological Summaries, Disastrous Weather Events, Marine Climatological Summary Charts, and Climate Diagnostics Bulletin published monthly and season-wise.

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**1. Department of Science and Technology** - The details of financial support provided by the Government during the period from 2015 to 2021 under National Mission for Sustaining the Himalayan Ecosystem and National Mission for Strategic Knowledge on Climate Change are as under:

Financial Year	Budget (Rs. in crores)
2015-16	15.89
2016-17	43.46
2017-18	49.77
2018-19	33.51
2019-20	40.76
2020-21	28.00

**2. Ministry of Earth Sciences (MoES)** has established the Centre for Climate Change Research (CCCR) at the Indian Institute of Tropical Meteorology (IITM), Pune, in January 2009. The Centre is dedicated to carry out research on global and regional climate change with a particular focus on the Indian climate and the monsoons.

Sr. No.	Year	Expenditure by CCCR (Rs. in crores)
1	2015-16	1.80
2	2016-17	1.74
3	2017-18	1.87
4	2018-19	1.95
5	2019-20	1.79
6	2020-21	0.49

To provide better services and improve its position, MoES has augmented its computational capacity by 6.8 Peta Flops installed at two MoES Institutes: 4.0 Peta Flops High Performance Computing (HPC) facility at IITM, Pune and 2.8 Peta Flops at National Centre for Medium Range Weather Forecasting (NCMRWF), Noida at a cost of about Rs 440 crore. Centre for Climate Change Research (CCCR) uses about 15% of the above computing resources.

To upgrade the climate services required for the country i.e., Climate Monitoring and Analysis, Climate Prediction (Seasonal Forecasts), Climate Data Management, Climate Research and Climate Applications, various programs namely Atmospheric Observation Network, Upgradation of Forecast System, Weather & Climate Services and Commissioning of Polarimetric Doppler Weather Radars. are being implemented in India Meteorological Department (IMD) under the umbrella scheme “Atmosphere & Climate Research-Modelling Observing Systems & Services (ACROSS)” of the MoES. Year-wise cumulative expenditure for all 4 sub-schemes of IMD under ACROSS during the last six years is as follows:

(Rs. in crores)

Name of Sub-scheme	Total expenditure during 2015-16	Total expenditure during 2016-17	Total expenditure during 2017-18	Total expenditure during 2018-19	Total expenditure during 2019-20	Total expenditure during 2020-2021
ACROSS-IMD (AON, UFS, WCS & PDWR)	166.68	144.08	134.09	175.94	206.04	150.33

### 3. Ministry of Environment, Forest and Climate Change

Details of Financial Support provided by the Ministry of Environment, Forest and Climate Change for research on climate change during the period from 2014-15 to 2019-20.

Financial Year	Name of the Institutions to whom fund released	Funds Released (in Rupees)
2014-15	The Energy & Research Institute, Delhi	₹1,830,000
	Integrated Research & Action for Development, New Delhi	₹1,800,000
	Institute of Economic Growth, New Delhi	₹1,298,000
	National Law School of India University, Karnataka	₹2,713,736
2015-16	Indian Institute of Tropical Meteorology-Pune, Maharashtra	₹2,500,000
	Institute of Economic Growth, New Delhi	₹1,730,000
	Integrated Research and Action for Development (IRADe)	₹2,400,000
	The Energy and Resources Institute-[TERI], New Delhi	₹2,400,000
	National Law School of India University, Karnataka	₹ 606,744
	The Energy and Resources Institute-[TERI], New Delhi	₹6,201,563
	Tata Institute of Social Sciences-Mumbai, Maharashtra	₹ 373,878
	Centre for Environment Education, Gujarat	₹ 626,800
	Suganthi Devadson Marine Research Institute, Tamil Nadu	₹4,000,000
	The Energy and Resources Institute, New Delhi	₹3,250,000
	Forest Survey Of India, Uttarakhand	₹ 900,000
2016-17	Indian Institute of Technology Bombay, Maharashtra	₹6,400,000
	Indian Institute of Technology Kanpur, Uttar Pradesh	₹3,000,000

Indian Institute of Technology Delhi, New Delhi	₹3,000,000
Indian Institute Of Science Education & Research, Bhopal, Madhya Pradesh	₹5,000,000
Indian Institute of Technology Chennai, Tamil Nadu	₹1,500,000
National Physical Laboratory New Delhi	₹1,500,000
CSIR Fourth Paradigm Institute, Karnataka	₹1,500,000
Indian Institute of Technology Kharagpur, West Bengal	₹1,500,000
Indian Institute of Science Education and Research, Chandigarh	₹1,500,000
Bose Institute Kolkata, West Bengal	₹1,500,000
University of Kashmir	₹1,500,000
Birla Institute of Technology, Mesra, Ranchi, Jharkhand	₹1,500,000
Indian Institute of Technology, Hyderabad	₹1,500,000
North-East Institute of Science & Technology, Assam	₹1,500,000
Environment Planning & Coordination Organisation (EPCO), Madhya Pradesh	₹21,680,000
Integrated Research and Action for Development [IRADe], New Delhi	₹ 1,800,000
The Energy and Resources Institute-[TERI], New Delhi	₹ 1,830,000
Indian Institute of Technology Bombay, Maharashtra	₹30,000,000
Indian Institute of Technology Kanpur, Uttar Pradesh	₹27,500,000
Indian Institute of Technology Delhi, New Delhi	₹30,000,000
Indian Institute Of Science Education & Research, Bhopal, Madhya Pradesh	₹27,500,000
Indian Institute of Technology Chennai, Tamil Nadu	₹ 5,000,000
National Physical Laboratory New Delhi	₹ 5,000,000
CSIR Fourth Paradigm Institute, Karnataka	₹ 2,500,000
Indian Institute of Technology Kharagpur, West Bengal	₹ 5,000,000
Indian Institute of Science Education and Research (IISER), Mohali, Chandigarh	₹ 2,500,000
Bose Institute Kolkata, West Bengal	₹ 2,500,000
University of Kashmir	₹ 2,500,000
Birla Institute of Technology, Mesra, Ranchi, Jharkhand	₹ 2,500,000
Indian Institute of Technology, Hyderabad	₹ 2,500,000
North-East Institute of Science & Technology, Assam	₹ 2,500,000
Indian Institute of Tropical Meteorology-Pune,	₹ 2,500,000

	Maharashtra		
2017-18	Indian Institute of Technology Bombay, Maharashtra	₹ 6,919,000	
	Indian Institute of Technology Kanpur, Uttar Pradesh	₹ 27,439,000	
	Indian Institute of Technology Delhi, New Delhi	₹ 21,379,000	
	Indian Institute of Science Education & Research, Bhopal, Madhya Pradesh	₹ 26,719,000	
	Bose Institute Kolkata, West Bengal	₹ 964,000	
	University of Kashmir	₹ 964,000	
	Birla Institute of Technology, Mesra, Ranchi, Jharkhand	₹ 964,000	
	Indian Institute of Technology, Hyderabad	₹ 964,000	
	Indian Institute of Tropical Meteorology-Pune, Maharashtra	₹ 964,000	
	North-East Institute of Science & Technology, Assam	₹ 964,000	
	Indian Institute of Technology Chennai, Tamil Nadu	₹ 4,904,000	
	National Physical Laboratory New Delhi	₹ 3,204,000	
	Indian Institute of Science Education and Research (IISER), Mohali, Chandigarh	₹ 964,000	
	Indian Institute of Technology Bombay, Maharashtra	₹ 7,181,981	
	Indian Institute of Technology Kanpur, Uttar Pradesh	₹ 6,466,829	
	Indian Institute of Science Education and Research (IISER), Mohali, Chandigarh	₹ 1,823,880	
	Indian Institute of Science Education & Research, Bhopal, Madhya Pradesh	₹ 5,207,947	
	Bose Institute Kolkata, West Bengal	₹ 1,823,880	
	University of Kashmir	₹ 1,823,880	
	Birla Institute of Technology, Mesra, Ranchi, Jharkhand	₹ 1,823,880	
	Indian Institute of Technology Chennai, Tamil Nadu	₹ 6,229,519	
	National Physical Laboratory New Delhi	₹ 3,796,267	
	Indian Institute of Technology, Hyderabad	₹ 1,632,568	
	Indian Institute of Tropical Meteorology-Pune, Maharashtra	₹ 632,568	
	North-East Institute of Science & Technology, Assam	₹ 1,632,568	
	CSIR Fourth Paradigm Institute, Karnataka	₹ 500,000	
	Indian Institute of Technology Kharagpur, West Bengal	₹ 800,000	
	Suganthi Devadson Marine Research Institute, Tamil Nadu	₹ 2,288,000	
	2018-19	Suganthi Devadson Marine Research Institute,	₹ 268,689

	Tamil Nadu	
	Environment Planning & Co-ordination Organisation, Madhya Pradesh	₹ 20,000,000
	Indian Institute of Technology Bombay, Maharashtra	₹ 28,500,000
	Indian Institute of Technology Kanpur, Uttar Pradesh	₹ 10,000,000
	Indian Institute of Technology Delhi, New Delhi	₹ 19,000,000
	Indian Institute of Science Education & Research, Bhopal, Madhya Pradesh	₹ 3,500,000
	Indian Institute of Technology, Hyderabad	₹ 640,000
	North-East Institute of Science & Technology, Assam	₹ 1,500,000
	Indian Institute of Technology Chennai, Tamil Nadu	₹ 7,000,000
	National Physical Laboratory New Delhi	₹ 5,000,000
	CSIR Fourth Paradigm Institute, Karnataka	₹ 2,000,000
	Indian Institute of Technology Kharagpur, West Bengal	₹ 3,000,000
2019-20	Indian Institute of Technology Bombay, Maharashtra	₹ 11,558,000
	Indian Institute of Science Bangalore, Karnataka	₹ 5,000,000
	Indian Institute of Science Bangalore, Karnataka	₹ 55,000,000

#### 4. Indian Space Research Organisation

Financial support is being provided to National Information System for Climate and Environmental Studies (NICES) at National Remote Sensing Centre (NRSC), ISRO. NICES is providing information on geophysical variables, relevant to climate and environmental variables, derived from space and ground based observations. These include ocean, atmosphere, terrestrial and cryospheric products which are being made accessible through NICES/Bhuvan geoportal.

Financial support provided to NICES programmes:

Financial Year	Expenditure (Rs. in Lakhs)
2015-16	81.00
2016-17	465.00
2017-18	327.00
2018-19	683.00
2019-20	375.00
2020-21	107.00

#### 5. Indian Council of Agricultural Research

Financial assistance provided by the Government of India to States and other institutions under National Innovations in Climate Resilient Agriculture (NICRA) project during 2015 to 2021:

Year	2015-16	2016-17	2017-18	2018-2019	2019-2020	2020-2021	Total
Budget (Rs. in Lakhs)	6284.00	6889.00	3628.00	4161.00	4058.00	4983.00	30003.00

#### **6. Council of Scientific and Industrial Research**

Funds provided by Council of Scientific and Industrial Research (CSIR) from its budgetary support is as follows:

S. No.	Year	Project	Amount (Rs. in Lakhs)
1	2019-20	Estimation of Climate Change Impacts on Forests and Mangroves Ecosystem of Andamans	350.000
2	2020-21	Mapping of the Impacts of Climate Change (Extreme Weather Events) on Health-Water Nexus in Aspirational Districts Clusters (ADCs)	155.430

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