

GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. - 2425**  
ANSWERED ON – 24/03/2022

**PACER Initiative**

**2425. Dr. Vikas Mahatme:**

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the status of implementation of the Polar Science and Cryosphere (PACER) initiative by Government;
- (b) achievements in the recent three years, the details thereof; and
- (c) whether Government has proposed subsequent scientific projects in this sector, if so, the details thereof?

**ANSWER**  
**THE MINISTER OF STATE (INDEPENDENT CHARGE) OF**  
**MINISTRY OF SCIENCE AND TECHNOLOGY AND**  
**EARTH SCIENCES**  
**(DR. JITENDRA SINGH)**

- (a) Polar Science and Cryosphere Research (PACER) scheme comprising the Antarctic program, Indian Arctic program, Southern Ocean program and Cryosphere and Climate program is implemented successfully through National Centre for Polar and Ocean Research (NCPOR), an autonomous institute under the Ministry of Earth Sciences.
- (b) Major achievements of the PACER scheme in the recent three years are as follows:
  - Executed 39<sup>th</sup> & 40<sup>th</sup> Indian Scientific Expedition to Antarctica. 41<sup>st</sup> Indian Scientific Expedition to Antarctica is ongoing. Ten sediment cores were collected from lakes to reconstruct the past climate associated with the ice-sheet dynamics. Various glaciological and geophysical measurements were carried out in coastal Dronning Maud Land (cDML) to understand the modern snow accumulation patterns around the ice rises and the remote contribution to the glaciochemical processes. In addition, field-based studies were conducted in the lakes of Larsemann hills, East Antarctica for understanding of biogeochemical process in supraglacial environments. Clear-air atmospheric observatories containing automatic weather stations, a suite of sensors to measure aerosol and greenhouse gas concentrations has been established at Maitri and Bharati stations. Analysis of ice cores were carried out to understand dissolved organic carbon pathways and long-term climate variability over Antarctica.
  - Twenty-three research projects related to glaciology, marine science, polar biology, and atmospheric science were successfully carried out during 2019-20 Arctic Expedition. IndARC mooring system along with Hydrophone system was successfully retrieved and deployed in Kongsfjorden, Svalbard. Coastal cruises were undertaken in the Arctic Svalbard archipelago to carry out biogeochemical and microbial research in the glacio-marine system. Modelling initiatives were started for various applications using Arctic Regional Ocean Model, Arctic regional atmospheric model with Chemistry module, and Global sea-ice simulations.

- Glaciological field campaigns were carried out in six benchmark glaciers in Chandra basin of Lahaul-Spiti region of Western Himalaya. Winter snow accumulation over the glaciers was recorded using snow pits and snow corer. Differential Global Positioning System (DGPS) and Ground Penetrating Radar (GPR) survey were conducted. Snow, ice, meltwater, water and cryoconite samples were collected from various glaciers and lakes. Two new Automatic Weather Station (AWS) systems were installed at Baralacha La, a high elevation site in the arid Spiti region to strengthen infrastructure across the Chandra basin.
  - The 11th Indian Southern Ocean Expedition was executed successfully. Various atmospheric, geological, oceanographic and biological measurements were conducted in the Prydz Bay as well as across various fronts of the Southern Ocean. Sediment cores were collected from 13 locations and Argo floats were deployed to measure the different ocean parameters.
- (c) The Polar Science and Cryosphere (PACER) scheme has been approved for continuation during 2021-2026.

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