GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 4267
TO BE ANSWERED ON WEDNESDAY, 26TH MARCH, 2025

DEEP-SEA EXPLORATION

4267. SHRI HARIBHAI PATEL:

Will the Minister of Earth Sciences be pleased to state:

(a) the details on the progress of the country's first manned submersible for deep-sea exploration;
(b) the contribution and achievement of the aforementioned Mission in harnessing untapped marine resources for sustainable development;
(c) the details of the technological innovations being developed under the aforementioned Mission;
(d) the measures taken/being taken by the Government to ensure that Indian scientists and engineers receive the necessary training for deep-sea exploration;
(e) the steps taken by the Government to encourage indigenous development of deep-sea exploration equipment; and
(f) whether the Government has any data on the aforementioned Mission's contribution in job creation and skill development in the marine and blue economy sector and if so, the details thereof?

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

(a) The Government of India launched the Deep Ocean Mission in September 2021, as a part of which the National Institute of Ocean Technology (NIOT) has developed a human submersible (named *Matsya-6000*) capable of carrying three crew to a depth of 6000 meters. Matsya-6000 has been successfully designed and integrated indigenously. It has a 2.1-meter diameter Titanium alloy personnel sphere that can bear up to 720 bars of external pressure, maintaining an inside pressure of 1 atmosphere. It is designed for operations of up to 12 hours, with an emergency endurance of up to 96 hours, supported by a certified Human Support and Safety System. It is equipped with an Underwater Acoustic Telephone that has been operated and tested for operations up to 10,000 meters depth, in addition to a sub-phone rated for 500-meter depth operations.It has completed wet/harbour trials demonstrating functionality (including floatation, vehicle stability, manoeuvrability, power, communication, and control devices) and human support and safety systems.

(b) Matsya-6000 is the country's flagship manned submersible enabling in situ observations of deep ocean resources through viewports and collection of samples through manipulator robotic arms to enhance India's deep-sea exploration and scientific research capabilities.

(c) Matsya-6000 is a fourth-generation human submersible for deep-sea scientific exploration designed with technological innovations such as a triple-redundancy drop weight mechanism, emergency release buoy with recovery mechanism, state-of-the-art high-density Lithium Polymer batteries, digital twin at the mission control centre to support the pilot during the emergency scenarios, bio-vest for three humans to monitor health parameters, and an ergonomically designed internal space for the crew.

(d) Indian scientists and engineers receive the necessary training for deep-sea exploration as part of collaboration with the Institute of Naval Medicine under the Indian Navy.

(e) The Titanium alloy personnel sphere for Matsya 6000 meters operations is developed indigenously in collaboration with ISRO. The bio-vest for the submersible crew members and select underwater applications are developed with DRDO. Further, collaborative research projects have been initiated with leading national government and academic institutes to complement the activities of the mission.

(f) Deep Ocean Mission (DOM) created employment of about 70 staff, and skill development in the marine sciences at national institutes and universities has been achieved by employing about 150 research scholars. The activities of the mission are aligned to enable deep-sea exploration and sustainable harnessing of ocean resources to thereby strengthen the Blue Economy.

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