

**GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
LOK SABHA  
UNSTARRED QUESTION NO. 3026  
TO BE ANSWERED ON WEDNESDAY, 19<sup>TH</sup> MARCH, 2025**

**SCIENTIFIC DEEP DRILLING IN KOYNA-WARNA REGION**

3026. SHRI VISHALDADA PRAKASHBAPU PATIL:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) the objectives and expected outcomes of the current mission to drill a 6-kilometer-deep borehole in the Koyna-Warna region, particularly in understanding reservoir-triggered seismicity;
- (b) the timeline and budget allocated for the completion of this deep drilling project and the agencies or institutions involved in its execution and research;
- (c) the specific methodologies and technologies being employed in this deep drilling project to study the Earth's crust and seismic activity; and
- (d) the anticipated impact of this deep drilling project on local communities and the environment, along with the measures being taken to mitigate any potential adverse effects?

**ANSWER**

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

- (a) The primary objective of the current mission to drill a 6-kilometer-deep borehole in the Koyna region is to acquire data on pre-seismic and post-seismic changes in rock properties in the near field of earthquakes, i.e., at depth of a few km below the surface. Analyses of such datasets and integration with other geological and geophysical data can enhance our understanding of the processes controlling reservoir-triggered earthquakes continuing for the past six decades in the Koyna region. The study will also add a new dimension to scientific efforts aimed at improving the predictive capability of such earthquakes and contribute to global research on triggered earthquakes.
- (b) The scientific deep-drilling project is being executed in multiple phases. The exploratory phase and the pilot phase have been completed successfully, and several new information have been obtained. The next phase comprising deep drilling to about 6 km depth and setting up of a deep borehole observatory in the Koyna region is highly challenging and is in the detailed planning stage. Accordingly, necessary budget will be allocated. The deep drilling is expected to be completed in the next 3-4 years.

The programme is being implemented by the Ministry of Earth Sciences - Borehole Geophysics Research Laboratory (MoES-BGRL), a dedicated centre established at Karad, Maharashtra for the purpose. A number of scientific institutions/universities in the country are contributing to the programme by conducting multi-disciplinary investigations and analyses of borehole core samples. MoES also leverages the technical expertise available with the oil industry in the country besides international expertise through MoU with International Continental Scientific Deep Drilling Program (ICDP).

- (c) The project employs advanced deep drilling methodologies, including mud rotary and air hammering techniques, core sampling from target depths, downhole geophysical measurements including high-resolution borehole imaging, advanced laboratory experimentation, and borehole sensor deployment including seismometers, temperature and pore pressure sensors, strainmeters, etc. These innovative technologies enable detailed study of the earthquake generation processes and also bring forth new information about physical and mechanical properties of the Earth's upper crust.
- (d) The results emerging from the deep drilling project and the associated local outreach activities implemented by MoES / BGRL are expected to generate awareness about the science of earthquakes, anticipated level of seismic activity and mitigation measures among the local communities. No adverse effects are envisaged.

\*\*\*\*\*