

What is Borehole Geophysics Research Laboratory (BGRL)?

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About Borehole Geophysics Research Laboratory (BGRL):

- The BGRL in **Karad, Maharashtra**, is a specialised institute **under the Ministry of Earth Sciences** mandated to **execute India's sole scientific deep-drilling programme**.
- Under BGRL, the aim is to drill the earth's crust to a **depth of 6 km** and conduct studies to help expand the **understanding of reservoir-triggered earthquakes** in the **Koyna-Warna region of Maharashtra**.
- This region has been experiencing **frequent earthquakes** since the **Shivaji Sagar Lake**, or the **Koyna Dam**, was **impounded in 1962**.
- BGRL's 3-km-deep pilot borehole in Koyna is complete; the Ministry of Earth Sciences is committed to reaching a depth of 6 km.
- It employs a **unique drilling strategy**—a **hybrid of mud rotary drilling** and **air hammering**.
- **Benefits of a deep-drilling mission:**
 - Scientifically drilled boreholes can be a hub of direct, unique **in situ experiments** and observations and **monitor a region's fault lines** and **seismic behaviour**.

- They also provide exact and fundamental knowledge of the composition of the **earth's crust, structure**, and processes, and help validate models based on surface studies.
 - Thus, it can inform a range of societal problems related to **geohazards and geo-resources**.
 - It can also help **expand scientific know-how** and technological innovation, especially in **seismology** (the study of earthquakes).
 - It can also spur the **development of tools** and equipment **for drilling, observation**, data analysis, sensors, etc.
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Q1: What is mud rotary drilling?

Mud rotary drilling is a method for wellbore excavation. It involves the use of a spinning drill bit aided by a semi-fluid mixture known as mud. Mud rotary drilling is adaptable for a wide range of trenchless construction situations, and is considered the most versatile and common of drilling methods.

Source: Why is India drilling a 6-km deep hole in Maharashtra?

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