

GOVERNMENT OF INDIA
MINISTRY OF MINES
RAJYA SABHA
UNSTARRED QUESTION NO.1558
ANSWERED ON 05.08.2024

USE OF EMERGING TECHNOLOGIES IN MINERAL EXPLORATION

1558. SHRI S. NIRANJAN REDDY:

Will the Minister of MINES be pleased to state:

- (a) the details of how emerging technologies like AI/ML are being used to accelerate mineral exploration by the Geological Survey of India (GSI) and the Indian Bureau of Mines (IBM);
- (b) the outcomes achieved through these technologies so far;
- (c) whether geospatial mapping and drone technologies are used in mineral exploration, including IIT Roorkee's drone project for real-time monitoring in open-cast coal mines, if so, details thereof; and
- (d) the progress in digitizing mining records and managing drone data through IBM's Drone Data Management System, and improvements in production, productivity, logistics, and safety in mines through these digital initiatives?

ANSWER

THE MINISTER OF COAL AND MINES

(SHRI G. KISHAN REDDY)

(a) & (b): Geological Survey of India (GSI) is giving emphasis on utilizing emerging technologies including AI/ML modelling for more efficient and accurate mineral prospecting in identification of new target areas in the country using large volume of Baseline Geoscience Data (viz. geological, geophysical and geochemical) generated by GSI. GSI with in-house resource has taken up a pilot project during field season 2023-24 to understand the logical relationship among various baseline data (geological, geophysical, geochemical and remote sensing etc.) and targeting sub-surface and/or geo-dynamically complex prospects/deposits through the applications of data-driven Artificial Intelligence (AI) and Machine Learning (ML) based methods. During the current field season 2024-25, GSI has taken up six AI/ML based projects, in which 5 projects are taken up on Mineral Prospectivity Mapping (MPM) with an aim to integrate geoscience dataset on GIS platform to delineate favourable areas for mineral exploration through multi-dimensional data analysis and 1 project on verification of prospective areas for basemetal, delineated through Machine Learning (ML) based geoscientific data integration. GSI is organising a hackathon on innovative mineral hunt techniques using state-of-art techniques practiced globally including emerging technologies like AI/ML.

The Indian Bureau of Mines (IBM) is not involved in mineral exploration.

(c): GSI has utilized the drone technology for detailed mapping in G3 stage exploration projects during field seasons 2022-23 and 2023-24 in the states of Madhya Pradesh and Odisha. As informed by Ministry of Coal, Central Mine Planning & Design Institute Limited (CMPDIL), under Coal India Limited, a CPSE of M/o Coal, is not using geospatial mapping and drone technologies for mineral exploration. Geospatial technologies including remote sensing and drones are used for topographical mapping and other geological applications. The information regarding IIT, Roorkee's drone project for real-time monitoring in open-cast coal mines is not available with CMPDIL.

(d): The drone data management application was launched by IBM on 01.06.2023. The drone / satellite based imagery of 1325 no. of leases have been received in this portal for the year 2022-23. Similarly, the drone / satellite based imagery of 1221 no. of leases have been received in the portal for the year 2023-24. The submitted imageries are used by the Regional offices during approval of mining plans and monitoring of mining operations.
