GOVERNMENT OF INDIA
MINISTRY OF COAL

**RAJYA SABHA**
**STARRED QUESTION NO. 8**
TO BE ANSWERED ON 21.07.2025

**AI-BASED SUSTAINABLE MINING**

*8 # **SMT DARSHANA SINGH**

Will the Minister of ***COAL*** be pleased to state:

(a) the mines across the country where drone surveys, AI-based mineral assessment and IoT-based monitoring systems have been implemented to promote sustainable mining;

(b) the reforms incorporated in existing mining license regulations to mandate environmental protection, water recycling and Mine Closure Plans in mining areas along with the proposed new policies in this regard; and

(c) the present status of Digital Mining Dashboards, real-time production monitoring and AI-based safety systems and whether these measures has been made mandatory?

**ANSWER**

MINISTER OF COAL AND MINES
(SHRI G. KISHAN REDDY)

(a) to (c): A statement is laid on the Table of the House.

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**STATEMENT REFERRED TO IN REPLY TO PARTS (A) TO (C) IN RESPECT OF RAJYA SABHA STARRED QUESTION NO. 8 FOR REPLY ON 21.07.2025 REGARDING 'AI-BASED SUSTAINABLE MINING' ASKED BY SMT DARSHANA SINGH**

**(a):** Drone Surveillance has been implemented in 45 opencast mines of CIL (Coal India Ltd). Under Project "DigiCoal" of CIL, pilot drone surveys have been implemented in seven mines i.e. Gevra OCP, Kusmunda OCP, Dipka OCP of SECL, Jayant OCP, Dudhichua OCP, Nigahi OCP, Khadia OCP of NCL (Northern Coalfields Ltd). CIL has installed Environmental Tele-Monitoring Systems (ETMS) in 27 underground mines for hazardous gas detection with IoT-based remote monitoring. Continuous Ambient Air Quality Monitoring System (CAAQMS) and Continuous Effluent Quality Monitoring Stations (CEQMS) are being introduced for real-time air and water quality monitoring in 111 mines.

NLC India Ltd (NLCIL) is using drones and Terrestrial Laser Scanner (TLS) at Talabira II & III OCP.

Ministry of Mines has implemented Drone Data Management System application (DDMS) developed in-house by IBM under Mining Tenement System project for online submission of Digital Aerial Images.

**(b):** The Ministry of Coal has issued guidelines for preparation of Mining Plan and Mine Closure Plans for coal and lignite blocks in January 2025, which embed Environment Management and Mine Closure aspects during mine planning and closure planning for coal mining projects.

Under provisions of the Mineral Conservation and Development Rules, 2017 (MCDR 2017), every lease holder is required to prepare a Progressive Mine Closure Plan (PMCP) and Final Mine Closure Plan (FMCP). The lease holders are mandated to submit a yearly report informing about the extent of protective and rehabilitative works carried out as per the mine closure plan. If the reclamation and rehabilitation (R&R) measures as envisaged in PMCP or FMCP are not implemented, the financial assurance given by the lease holder is forfeited by the State Government.

As part of grant of Environmental Clearance, the prospective lessees carry out Environment Impact Assessment (EIA) and submit the Environment Management Plan (EMP) based on scientific study by taking into consideration the likely impact of project activity on the baseline environment.

Further, the mining projects are mandated to obtain No Objection Certificate for ground water extraction subject to specific conditions under the guidelines issued by the Ministry of Jal Shakti to regulate and control ground water extraction in India.

Water collected in mine sumps, originating from both running mines and abandoned water-filled underground and open cast voids, undergoes appropriate treatment processes including sedimentation, filtration and disinfection. After minor treatment, the quality of this mine water generally meets standards suitable for domestic and irrigation purposes. Furthermore, treated mine water is also used for industrial activities, groundwater recharge and pisciculture.

**(c):** PSUs under the Ministry of Coal have implemented ERP for real-time production reporting and monitoring. Further, AI-based Integrated Command and Control Centres (ICCCs) have been implemented in 5 subsidiaries of Coal India Limited featuring advanced surveillance, analytics and safety related use cases which includes fire and smoke detection, safety gear violations (such as person without helmet, PPE), crowd and intrusion detection, insufficient illumination, and water logging and sagging electrical wires.

NLCIL has implemented Digital Logistic Management System (DLMS) at Talabira II & III OCP to facilitate real-time surveillance and monitoring of dispatch activities. DLMS enables unmanned weighbridge operations and provides a bridge to NLCIL's SAP ERP system, enabling real-time data exchange and synchronization, allowing for real-time generation of coal dispatch reports.

Indian Bureau of Mines (IBM) under Ministry of Mines has implemented the Mining Tenement System dashboard to digitize & streamline mining-related processes, enhance transparency, facilitate better data management, enhance collaboration among stakeholders, provide a flexible system to accommodate future technology advancements and improve efficiency of mineral resource management.

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