GOVERNMENT OF INDIA
MINISTRY OF COAL

RAJYA SABHA
UNSTARRED QUESTION NO 2589
TO BE ANSWERED ON 24.03.2025

Research and development in the coal sector in Maharashtra

2589. Dr. Ajeet Madhavrao Gopchade:

Will the Minister of Coal be pleased to state:

(a) whether Government has introduced new technologies in mining operations to modernize the coal sector in the State of Maharashtra, if so, provide specifics and highlight the achievements;
(b) fund allocated for research and development in the coal sector in the State of Maharashtra during the last three years; and
(c) details of the information regarding cooperation with the State and the Central Governments?

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

(a): Yes Sir. Government has adopted new technologies in mining operations for modernization of the coal sector including in Maharashtra. Government has launched a Technology Roadmap for the coal sector with the objective to implement new technologies and build up digital infrastructure to support current and future mechanisation and modernization of the coal mines. The main focus is to bring blastfree technology in both Underground & Opencast mines and introduction of Continuous Miner, Longwall, Highwall and Surface Miner technologies by identification of mines where geo-mining conditions permits use of such technologies. The main thrust behind these technologies are enhancement of a safer work environment, increased coal recovery and greater efficiency. Other areas identified for the introduction of new technologies are transportation, communication, digitization, safety, environment and sustainability etc.

Coal India Limited (CIL) through one of its subsidiary companies, namely Western Coalfields Limited (WCL) is operating coal mines in the state of Maharashtra. In pursuance of the above initiatives of the Government, WCL has adopted various new technologies in mining operations for modernization of coal mines as detailed below:

(i) For the introduction of new technology and modernization in coal production in the command area of WCL, Maharashtra following technologies have been considered:-

- Continuous Miner technology has been adopted in underground mine at Saoner UG-I, for which LOA has been issued.
- Surface Miner technology has been introduced in six Opencast mines, i.e. Penganga, Amalgamated Yekona I & II, Pauni-II OC Expansion, Mungoli Niruguda Extn Deep, Sasti Expn & Neeljai Expansion Deep.

(ii) Global Positioning System/ General Pocket radio System (GPS/GPRS) based Vehicle Tracking System (VTS) with 3038 GPS sets, Geo-fencing of Mines of WCL and coal transportation route mapping is in place for effective real-time monitoring of movement of internal coal carrying vehicles & vehicles for Overburden (OB) and Coal Productions in Mines.

(iii) Increased electronic surveillance through centralized CCTV system with 745 Fixed/Pan-tilt -Zoom camera (PTZ) at all vulnerable points across WCL command area.

(iv) Integrated Command and Control Centre (ICCC) for e-surveillance established at WCL HQ, Nagpur for 24x7 live monitoring and recording of video footage from Cameras installed and working at vulnerable points such as weighbridges, Check Posts, Mine View Points, Coal Stocks, Sidings, etc. across command area of WCL with Artificial Intelligence (AI) based video analytics.

(v) Radio Frequency Identification (RFID) based Boom barrier access control system has been implemented at all Check posts to prevent entry of unauthorized vehicles in mines. RFID based Weighment integration has been implemented at all the road weigh bridges with auto capturing of vehicle number without any manual intervention.

(vi) Drone technology has been implemented for operation, safety, environmental, and security surveillance in opencast mines of WCL including 3D scanner for volumetric measurement of coal and overburden heaps.

(vii) Action has been taken for the implementation of new upgraded Information Technology (IT) initiative system in WCL with the integration of Automatic Number Plate Recognition (ANPR) & Radio Frequency Identification (RFID) based boom barrier system at mine entry and exit, CCTV system with edge analytics, ANPR & RFID based weighment automation system and GPS/GPRS based Vehicle Tracking System (VTS) on common ICCC platform for effective monitoring and reporting. The system includes integration of 1250 cameras and Artificial Intelligence/Machine Learning (AI/ML) video analytics.

For Commercial/Captive Mines, under Commercial auction scheme, Coal Block Development and Production Agreement executed between the successful bidder and Nominated Authority mandates that the Successful Bidder shall implement mechanised coal extraction, transport, and evacuation in the Coal Mine, in line with modern and prevalent technologies.

(b): Disbursement made in research & development projects in coal sector in Maharashtra during the last three (3) years and till date are as follows:

Year	**2021-22**	**2022-23**	**2023-24**	**2024-25** (till 13.03.25)
Amount (Rs. in Cr.)	**12.24**	**2.30**	**19.05**	**3.09**

(c): At present, there is no collaboration with the State and local Governments in the area of technology upgradation and modernization. However, during the last three years, R&D projects have been undertaken in cooperation with the following institutes in the state of Maharashtra:

1. IIT, Bombay
2. VNIT, Nagpur
3. JNARDDC, Nagpur
4. SAMEER, Mumbai
5. CIMFR, Nagpur
6. Shri Ramdeo Baba College of Engineering & Management (RCEM), Nagpur
7. WCL, Nagpur
8. RI-IV, CMPDI, Nagpur

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