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Meghalaya's Rat-Hole Coal Mining Crisis: Environmental Governance, Mine Closure and the Challenge of Sustainable Regulation

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Recent Developments:

- A committee headed by **Justice (Retd.) B.P. Katakey** has criticised the Meghalaya Government for delays in adopting a comprehensive **mine closure and restoration policy** and for inadequate action against continuing **illegal rat-hole coal mining**.
- The Meghalaya High Court constituted the single-member committee in **2022** to recommend measures for implementing directions issued by the **National Green Tribunal (NGT)** concerning illegal and unscientific coal mining.
- The issue remains active in **2026**. The Meghalaya High Court has continued examining the committee's interim reports, including concerns regarding illegal mining, accountability of officials, treatment and closure of mines, transportation of illegally mined coal and implementation of the **2024 Standard Operating Procedure (SOP)**.
- In **February 2026**, the High Court also took note of another illegal-mining incident at **Thangsko in East Jaintia Hills**, demonstrating that illegal mining has persisted despite the long-standing prohibition.
- The continuing controversy highlights the intersection of **environmental protection, occupational safety, tribal land rights, livelihood security, federalism and rule of law**.

Background to Rat-Hole Coal Mining in Meghalaya:

Nature of the Mining Practice:

- **Rat-hole mining** is a highly narrow and hazardous form of underground coal extraction in which miners enter small tunnels to reach thin coal seams.
- The tunnels are generally only around **3–4 feet high**, allowing workers to crawl through them and manually extract coal.
- Miners typically use **ropes, bamboo ladders and primitive tools** such as pickaxes, shovels and baskets.
- Meghalaya's geological conditions, particularly its **thin and scattered coal seams**, historically encouraged this method because conventional large-scale mechanised mining could be economically difficult in some locations.
- The Meghalaya Government has also highlighted that the State has distinctive **Sixth Schedule** arrangements in which land and minerals may belong to individuals, clans or communities rather than being State-owned, creating a distinctive regulatory context.

NGT Ban:

- The NGT ordered an **immediate stoppage of rat-hole and illegal coal mining throughout Meghalaya on 17 April 2014**, along with a prohibition on illegal transportation of coal.

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- The Tribunal considered rat-hole mining **illegal, unscientific and life-threatening**, besides causing serious environmental degradation.
- The NGT had earlier noted extremely acidic mine drainage in Meghalaya, with some analysed samples showing a **pH below 3**, demonstrating the severity of water pollution associated with mining.
- The prohibition was subsequently maintained, and the Supreme Court examined the continuing litigation surrounding illegal mining and environmental restoration.

Key Concerns Identified by the Katakey Committee:

Delay in Mine Closure and Restoration:

- Meghalaya has faced delays in implementing a comprehensive policy for the **closure, fencing, reclamation and ecological restoration of abandoned and illegally operated mines**.
- Many abandoned mine openings remain **unfenced or uncovered**, creating continuing risks for people and livestock.
- The committee has emphasised that every dangerous mine opening should be secured until a permanent closure mechanism is implemented.
- The issue is therefore not limited to stopping new illegal mining; it also involves managing the **legacy environmental and safety liabilities** created by decades of unscientific extraction.

Large Number of Abandoned Mine Openings:

- **East Jaintia Hills** remains one of the most severely affected areas because of the concentration of abandoned and illegally operated coal mine openings.
- Earlier committee findings identified **more than 22,000 rat-hole mine openings** in the district, underlining the enormous scale of the mine-closure challenge.
- Such dispersed mine openings make conventional enforcement difficult and require **geospatial mapping, continuous surveillance and community-level monitoring**.

Inadequate Restoration Planning:

- The **Central Mine Planning and Design Institute Limited** prepared detailed project reports for pilot restoration projects at **Sutnga in East Jaintia Hills** and **Arenggtim in South Garo Hills**.
- The proposed restoration projects were valued at approximately **₹63 lakh and ₹92.78 lakh**, respectively.
- Delays in obtaining necessary approvals demonstrate the institutional difficulty of translating environmental restoration plans into field-level action.
- The NGT has previously required funds available through environmental restoration mechanisms to be used for implementing action plans for areas damaged by coal mining.

Why Rat-Hole Mining is Hazardous:

Occupational Safety:

- Rat-hole mining involves **unstable underground passages, inadequate ventilation, weak structural support and limited emergency access**.
- Workers face risks from **mine collapse, flooding, toxic gases, explosions and oxygen deficiency**.
- The history of Meghalaya includes several fatal mining accidents, including the trapping and death of miners in **East Jaintia Hills**.
- A 2018 accident involving **15 miners** became a major symbol of the continuing dangers of rat-hole mining.
- More recently, the Meghalaya High Court recorded another illegal-mining accident at **Thangsko in January 2026**, demonstrating that enforcement failures continue to have human costs.

Environmental Degradation:

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- Unscientific extraction causes **land degradation, deforestation, soil instability and destruction of natural drainage systems**.
- Mine drainage can become highly acidic because of the oxidation of sulphide minerals, resulting in **acid mine drainage**.
- Acidic drainage can contaminate streams, rivers and groundwater and adversely affect aquatic ecosystems.
- The **Kopili and Lukha river systems** have been associated with serious pollution concerns arising from coal mining activities.
- Environmental damage can continue even after mining stops because abandoned shafts and waste materials remain sources of pollution.

Child Labour and Human Rights:

- The extremely narrow dimensions of rat-hole tunnels have historically encouraged the use of children because they can physically enter confined spaces more easily.
- Such practices raise serious concerns regarding **child labour, trafficking, occupational safety and the right to education**.
- The issue therefore extends beyond environmental regulation to the broader constitutional objective of protecting vulnerable sections of society.

Why Illegal Rat-Hole Mining Persists:

Livelihood Dependence:

- Mining has historically provided income in several coal-producing communities where alternative employment opportunities are limited.
- A sudden prohibition without adequate livelihood transition can create **economic insecurity and social resistance**.
- The Meghalaya Government has argued that thousands of families historically dependent on small-scale coal extraction were affected by the 2014 prohibition.

Economic Characteristics of Meghalaya's Coal:

- Meghalaya's coal seams are often **thin, scattered and located in difficult hilly terrain**.
- Conventional mining may require substantial expenditure on excavation, rock removal, mine support and environmental safeguards.
- This creates an economic incentive for small-scale operators to continue using low-cost but unsafe extraction techniques.

Governance and Enforcement Deficits:

- Illegal mining may persist when enforcement agencies face **insufficient manpower, weak inter-agency coordination, inadequate surveillance and poor accountability**.
- The High Court in 2026 noted concerns regarding the adequacy of investigation into illegal-mining cases and the fixing of responsibility on officials.
- The problem therefore requires not merely more prohibitory orders but **credible enforcement and institutional accountability**.

Legal and Institutional Framework:

National Green Tribunal:

- The NGT's **17 April 2014 order** prohibited rat-hole and illegal coal mining throughout Meghalaya.
- The Tribunal subsequently directed measures concerning **coal inventory, transportation, environmental restoration and rehabilitation of victims**.

- In 2018, the NGT continued the prohibition and established mechanisms for environmental restoration and rehabilitation.

Supreme Court:

- The Supreme Court examined the legality and regulatory dimensions of Meghalaya's coal-mining practices in **State of Meghalaya v. All Dimas Students Union** and connected matters.
- The Court recognised the serious environmental and regulatory concerns arising from unscientific mining while examining the relationship between **tribal land rights and statutory mining regulation**.
- The case demonstrates that ownership of land or minerals under customary or Sixth Schedule arrangements does not eliminate the requirement to comply with applicable **environmental and mining laws**.

Meghalaya High Court and Katakey Committee:

- The Meghalaya High Court constituted the **Justice B.P. Katakey Committee** in 2022 to assist in monitoring compliance with directions concerning illegal coal mining.
- The committee has submitted successive interim reports identifying shortcomings in enforcement, mine closure, transportation control, restoration and official accountability.
- In 2026, the High Court directed the State to provide detailed status reports on several recommendations and continued judicial monitoring of implementation.

Government Measures to Curb Illegal Mining:

Surveillance and Reporting:

- The Government has introduced **Khanan Prahari**, a mobile application for reporting unauthorised coal mining activities.
- The **Coal Mine Surveillance and Management System** uses technology to facilitate monitoring and reporting of illegal mining.
- Such systems can strengthen enforcement by enabling quicker identification and reporting of suspicious mining activity.

Multi-Level Enforcement:

- Monitoring committees and task forces have been constituted at different administrative levels in the coal-mining ecosystem.
- Effective enforcement requires coordination among the **district administration, police, mining authorities, pollution-control agencies and local institutions**.
- Recent enforcement measures in East Jaintia Hills have included **special enforcement teams, seizures, arrests and drone-based surveillance**.

Transition to Scientific Mining:

- Meghalaya has been moving towards **regulated and scientifically managed coal mining** under applicable mining and environmental regulations.
- The transition seeks to replace informal extraction with legally authorised mining supported by **mine plans, safety standards, environmental safeguards and regulatory supervision**.
- The transition must nevertheless account for Meghalaya's distinctive geological, social and land-ownership conditions.

Broader Environmental and Governance Significance:

Sustainable Development:

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- Meghalaya's experience illustrates the tension between **economic livelihoods and environmental sustainability**.
- A successful policy must move from a narrow ban-oriented approach towards **just transition**, combining environmental restoration with alternative employment.

Federalism and Sixth Schedule:

- Coal mining in Meghalaya involves a complex interaction between **Union mining legislation, State regulation, autonomous district institutions, customary landholding and environmental jurisprudence**.
- This makes Meghalaya an important case study in **cooperative federalism and differentiated governance**.
- Effective regulation should respect legitimate local institutions while ensuring compliance with national environmental and safety standards.

Environmental Rule of Law:

- The prolonged continuation of illegal mining despite judicial prohibition highlights the importance of **implementation capacity**.
- Environmental governance is effective only when laws, judicial orders, regulatory institutions and enforcement agencies operate coherently.
- The case therefore demonstrates the difference between **de jure environmental protection and de facto environmental governance**.

Way Ahead:

Scientific Mine Closure:

- Meghalaya should adopt a **time-bound, legally enforceable mine-closure policy** covering mapping, fencing, backfilling, land reclamation, water treatment and ecological restoration.
- Abandoned mine openings should first be **geo-tagged and secured** to prevent accidental deaths while permanent restoration is undertaken.

Just Transition for Mining Communities:

- Alternative livelihoods should be developed through **skill development, horticulture, tourism, handicrafts, agro-processing, fisheries and small enterprises**.
- Rehabilitation should involve affected communities so that environmental regulation does not translate into prolonged livelihood insecurity.

Technology-Based Enforcement:

- Authorities should integrate **drones, satellite imagery, geographic information systems, artificial intelligence-based detection and digital transport permits** for real-time monitoring.
- Data should be shared among mining, police, revenue and environmental authorities to prevent regulatory fragmentation.

Accountability and Community Participation:

- Clear responsibility should be fixed on officials for persistent illegal mining within their jurisdictions.
- Local communities should be involved in **reporting, monitoring and restoration**, because community participation can improve enforcement legitimacy and reduce dependence on illegal extraction.

Conclusion:

- Meghalaya's rat-hole mining crisis is not merely an issue of illegal coal extraction; it represents a broader challenge involving **environmental degradation, occupational safety, livelihood dependence, tribal rights, institutional capacity and sustainable development**.
- The long-standing NGT prohibition and continuing judicial monitoring demonstrate that **legal prohibition alone cannot eliminate an economically embedded informal activity**.
- The durable solution lies in combining **scientific mining, strict enforcement, mine closure, ecological restoration, alternative livelihoods, technological surveillance and community participation**.
- Meghalaya can therefore transform the present crisis into an example of **just transition and sustainable resource governance**, provided that environmental protection and livelihood security are pursued together.

Value Addition for UPSC:

Key Constitutional and Legal Linkages:

- **Article 21:** The right to life includes the right to live in a clean and healthy environment and is relevant to unsafe mining and environmental degradation.
- **Article 48A:** The State is required to protect and improve the environment and safeguard forests and wildlife.
- **Article 51A(g):** Citizens have a fundamental duty to protect and improve the natural environment.
- **Sixth Schedule:** Meghalaya's autonomous district arrangements are important for understanding the relationship between **customary land rights, tribal institutions and resource governance**.
- **Environment Protection Act, 1986:** Provides the broad statutory framework for environmental protection and regulation.
- **Mines and Minerals (Development and Regulation) Act, 1957:** Provides the principal statutory framework for mineral development and regulation.
- **Water (Prevention and Control of Pollution) Act, 1974:** Becomes relevant where mining causes contamination of water bodies.
- **Air (Prevention and Control of Pollution) Act, 1981:** Addresses air pollution associated with mining and related industrial activities.

UPSC Mains Linkages:

- **GS Paper I:** Tribal communities, North-Eastern India, resource distribution and regional development.
- **GS Paper II:** Federalism, Sixth Schedule, judicial activism, environmental governance and institutional accountability.
- **GS Paper III:** Mineral resources, sustainable mining, environmental pollution, disaster management and inclusive growth.
- **Essay:** "Development without ecological sustainability creates hidden economic and social liabilities."