



## Rat Hole Mining

**For Prelims:** [Article 371A](#), [Rat-Hole Mining](#), [Coal](#), [National Green Tribunal \(NGT\)](#)

**For Mains:** [Article 371A limitations and challenges](#), Sustainable mining practices, [Rat-Hole Mining](#), [Environmental pollution and degradation](#), Challenges Related to the Indian Himalayan Region.

**Source:** [DTE](#)

### Why in News?

Recently, authorities were given four weeks by the [National Green Tribunal \(NGT\)](#) to respond in a case related to the death of six workers in a [rat-hole](#) coal mine fire in Nagaland's Wokha district.

### What is Rat-Hole Mining?

#### ▪ About:

- Rat-hole mining, aptly named for its resemblance to rodent burrows, is an **illegal and highly hazardous method** of extracting coal prevalent in certain pockets of India, particularly the state of Meghalaya.
- Unlike large-scale mechanised mines, this practice involves **digging narrow, horizontal tunnels** barely large enough for a single person to squeeze through.
- These tunnels, often referred to as "rat holes," can extend tens of meters underground.
- Miners descend precariously using ropes, bamboo ladders, or makeshift supports and work in cramped, poorly ventilated conditions with basic tools like pickaxes and shovels.
- The extracted coal is then hauled back up through these narrow passages, making the entire process incredibly **dangerous and backbreaking**.

#### ▪ Types:

- **Side-Cutting Procedure:** Narrow tunnels are dug into hill slopes in the side-cutting procedure, where workers enter to locate the typically less than 2m thin coal seam in Meghalaya's hills.
- **Box-cutting:** In box-cutting, a rectangular opening is created, followed by digging a vertical pit, and then rat-hole-sized tunnels are dug horizontally for coal extraction.

#### ▪ Geographical Spread:

- While predominantly **practised in Meghalaya**, reports of rat-hole mining have surfaced in **other northeastern states** of India as well.
- This method thrives in regions with **thin coal seams**, unsuitable for large-scale mining techniques.

#### ▪ Causes of Rat Hole Mining:

- **Poverty:** Local [tribal populations](#) with limited livelihood options, often resort to rat-hole mining as a means of survival.
  - The quick cash generated from selling the extracted coal, despite the risks involved, becomes a **tempting proposition** for those struggling to make ends meet.
- **Land Ownership:**

- Ambiguous land titles pose challenges for establishing regulated mines, creating opportunities for illegal operators to exploit loopholes and persist in their activities.
- **Coal Demand:** The constant demand for coal, both legal and illegal, fuels the practice of rat-hole mining.
  - Middlemen and illegal traders create a **market for this illegally extracted coal**, perpetuating the cycle and putting the lives of miners at risk.
- **Issues:**
  - **Danger to Life and Limb:** The narrow tunnels are **prone to collapses**, often trapping miners underground.
    - Poor ventilation leads to suffocation, and the lack of proper safety measures makes them vulnerable to accidents, injuries and life threatening diseases.
  - **Environmental Damage:** [Deforestation to clear land for access points](#), [soil erosion](#) from **haphazard digging**, and [water contamination](#) due to improper waste disposal are some of the lasting environmental consequences of this practice.
    - Rat hole mines also **cause acidic runoff, known as Acid Mine Drainage (AMD)**, leading to degraded water quality and reduced biodiversity in affected water bodies.

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## The Silkyara (Uttarakhand) Tunnel Collapse

- The **2023 Uttarakhand tunnel collapse**, where 41 workers were trapped, presented a unique situation where a **banned technique, rat-hole mining**, became the key to their successful rescue.
- The miners successfully dug a narrow passage, enabling the rescue of all 41 workers. This case exemplifies the **technique's potential for rapid rescue** in extreme situations.
  - However, it's a **high-risk technique**. This case should not overshadow the importance of prioritising safe and regulated mining practices.

## What are the Ways to Regulate Rat Hole Mining?

- **Regulation of Rat-Hole Mining in Nagaland:**
  - Nagaland has 492.68 million tonnes of coal reserves scattered in **small, erratic pockets**, leading to the permission of rat-hole mining under its 2006 [Nagaland Coal mining policy](#) due to the impracticality of large-scale operations.
  - Rat-hole mining licences, known as **small pocket deposit licences**, are exclusively granted to individual landowners for limited durations and specific conditions.
  - Rat-hole mining requires **approval from departments** like Forest and Environment to ensure environmental compliance, yet illegal operations persist despite government clearance and plans.
- **Article 371A and Controlling Rat-Hole Mining in Nagaland:**

- [Article 371A](#) complicates government regulation in Nagaland, **hindering oversight** of small-scale mining, especially by individual landowners.
- **Remedies:**
  - **Livelihood Alternatives:** Providing sustainable income sources is crucial. This can involve [skilling development programs](#), promoting alternative industries like **tourism or handicrafts**, and creating [micro-financing opportunities](#).
    - By offering a **more secure and less dangerous path** to financial security, communities can be **incentivised** to leave behind rat-hole mining.
  - **Sustainable Mining Practices:** Exploring **alternative, less hazardous mining** techniques suitable for extracting coal from thin seams is essential.
    - Research into and adoption of technologies like **bord and pillar mining** or **small-scale mechanised mining** could pave the way for a safer and more efficient approach.
  - **Stricter Enforcement:** Strengthening **law enforcement** and imposing **harsher penalties** on those involved in illegal mining can act as a **strong deterrent**.
- **Legal Landscape:**
  - **International Context:** There's **no specific international law** directly addressing rat-hole mining.
    - However, international regulations **promote [sustainable mining methods](#)** and prioritise worker safety, indirectly influencing member states to adopt similar practices.
  - **Indian Context:** Recognising the dangers of this practice, the [National Green Tribunal \(NGT\)](#) **banned rat-hole mining in India in 2014**.
  - **Government Initiative:**
    - The NGT ban on rat-hole mining, though **not fully effective**, demonstrates a commitment to ending this practice.
    - Schemes promoting alternative livelihoods, like the [Mahatma Gandhi National Rural Employment Guarantee Act \(MGNREGA\)](#), aim to provide alternative income sources for those dependent on rat hole mining.

## Conclusion

- Moving forward, a **multi-pronged approach** is necessary. As seen in many countries, a **complete ban** on rat-hole mining offers a definitive solution.
  - However, for regions **economically dependent** on small-scale mining, the focus should be on **developing and implementing safe alternatives**.
- Investing in **research and development** of mechanized, small-scale mining equipment can provide a safer and more efficient solution. Additionally, **robust safety training programs** and strict enforcement of regulations are crucial to prevent future tragedies.

### Drishti Mains Question:

Q. Discuss the environmental and safety concerns associated with rat-hole mining in India. Suggest measures to address these issues while ensuring sustainable mining practices.

## UPSC Civil Services Examination, Previous Year Questions (PYQ)

### Mains

Q. In spite of adverse environmental impact, coal mining is still inevitable for development. Discuss. (2017)

