

# **RAT-HOLE MINING – DISASTER MANAGEMENT**

**NEWS**: Nine coal miners trapped in a water-filled mine in Dima Hasao district, Assam, since 8 a.m. on January 8, 2025.

## WHAT'S IN THE NEWS?

#### The Incident in Dima Hasao, Assam

- Location and Date: The incident occurred in the Dima Hasao district of Assam on January 6, 2025.
- Details of the Accident:
  - Nine workers, aged between 26 and 57, were trapped in a flooded coal "rat-hole" mine.
  - The flooding caused the water level inside the pit to rise to 200 feet, making rescue operations challenging.
- Casualties:
  - By January 7, three miners had been confirmed dead.
  - Six workers remained trapped, and their status was unknown.
- Rescue Efforts:
  - An Indian Navy team, including experienced deep-sea divers, was deployed to assist in rescue operations.
  - The depth of the water and poor mine infrastructure posed significant challenges to the rescuers.

#### **Understanding Rat-Hole Mining**

- Definition:
  - Rat-hole mining is a method of coal extraction involving the digging of narrow vertical or horizontal pits.
  - The term "rat-hole" is used due to the small size of the pits, often just large enough for one person to descend.
- Process:
  - Narrow pits or tunnels are dug to access coal seams.
  - Miners descend using ropes or bamboo ladders.



- Coal is extracted manually with primitive tools such as pickaxes, shovels, and baskets.
- Geographic Prevalence:
  - Rat-hole mining is most commonly associated with the northeastern states of India, particularly Meghalaya.

### **Types of Rat-Hole Mining**

- (i) Side-Cutting Mining:
  - Tunnels are dug horizontally on hill slopes to access coal seams.
  - The coal seams in Meghalaya are usually very thin, often less than 2 meters in thickness.
  - Workers manually extract coal by crawling into these tunnels.
- (ii) Box-Cutting Mining:
  - A rectangular opening (10–100 sqm) is created on the surface.
  - A vertical pit, typically 100 to 400 feet deep, is dug to locate coal seams.
  - Once coal seams are identified, horizontal tunnels (rat-hole-sized) are created for extraction.



## **Concerns Associated with Rat-Hole Mining**

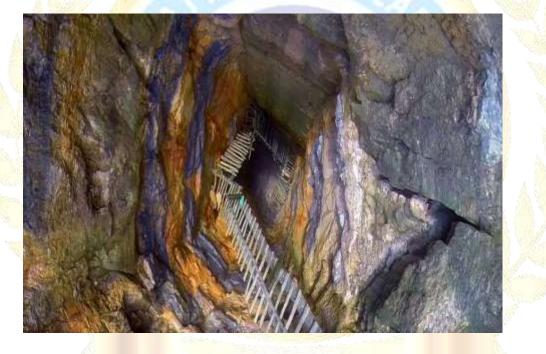
- Safety Hazards:
  - The mines are typically unregulated, with no proper ventilation or structural support.



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- Workers often lack safety gear, exposing them to injuries, suffocation, and fatal accidents.
- Flooding incidents, like the one in Dima Hasao, highlight the severe risks involved.
- Environmental Impact:
  - Causes significant land degradation due to extensive digging and tunnel formation.
  - Leads to deforestation as vegetation is cleared for mining operations.
  - Contaminates water bodies through the discharge of mine waste and chemicals.
- Economic and Social Concerns:
  - Despite its dangers, rat-hole mining persists because of its economic benefits to local communities.
  - Many locals, lacking alternative livelihoods, rely on mining for income.



## Legal and Regulatory Context

- National Green Tribunal (NGT) Ban:
  - Rat-hole mining was banned by the NGT in 2014 on the grounds that it is unscientific and unsafe for workers.
  - The ban was upheld in 2015, particularly targeting Meghalaya, where the practice is widespread.
- Challenges to the Ban:



- The Meghalaya state government appealed the NGT's decision in the Supreme Court.
- Enforcing the ban has been difficult due to economic dependence on mining and weak regulatory oversight.

### **Rat-Hole Mining in Rescue Operations**

- Silkyara-Barkot Tunnel Rescue (2023):
  - Rat-hole miners played a crucial role in the rescue of 41 workers trapped in a collapsed tunnel in Uttarakhand.
  - After conventional auger machines failed due to metal debris blocking the way, miners were called in.
  - Using traditional rat-hole mining techniques, they manually dug through the last 12 meters of debris to reach the trapped workers.
  - This demonstrated how the skills of rat-hole miners could be repurposed for critical rescue missions, despite the hazards associated with the practice.

#### Key Takeaways

- Primitive Yet Persistent:
  - Rat-hole mining remains a widespread, albeit illegal, practice due to economic factors and lack of alternatives.

#### Significant Hazards:

- The practice is fraught with safety and environmental concerns, often resulting in fatalities and ecological damage.
- Legal and Social Dilemma:
  - Despite the NGT ban, rat-hole mining continues in many areas due to ineffective enforcement and economic dependence.
- Rescue Operations:
  - While dangerous, rat-hole mining techniques have occasionally been instrumental in life-saving rescue operations, such as in Uttarakhand in 2023.

**Source:** <u>https://indianexpress.com/article/upsc-current-affairs/upsc-essentials/knowledge-nugget-of-the-day-rat-hole-mining-upsc-9764441/</u>