



## 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.



- 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.

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