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)**