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Q17

Mineral resources are fundamental to the country's economy and these are exploited by mining. Why is mining considered an environmental hazard? Explain the remedial measures required to reduce the environmental hazard due to mining.

UPSC Civil Services Mains 2025 · GS III · 15 marks · Environment and Conservation

Conservation, environmental pollution and degradation, environmental impact assessment.

Core demand of the question

- **Hazards:** land, water, air, forest, people, dumps
- **Remedies:** EIA, DMF, scientific mining, closure, FRA, illegal-mining police

Revision summary

Mining underpins industry but strips forest, dirties air and water, and displaces people.

Open-cast coal, metal tailings, sand mining and illegal pits are the main Indian hazard types.

EIA, District Mineral Foundations, scientific closure and forest rights are the legal remedies.

Illegal mining needs satellite watch and police, not only a new rule.

Some deposits should remain unmined where ecology and consent fail.

Introduction

Steel, copper, coal and rare earths **start in a hole**. Mining is therefore **fundamental** to a factory India. It is also an **environmental hazard because a hole does not stay a hole: it becomes dust, acid water, a lost forest, and a displaced hamlet**. The task is not to romanticise a pre-mine village or to bless every lease. It is to **mine as if water and people will still be there**.

Body**Why mining is a hazard**

Open-cast coal in the Damodar and Hasdeo belts **strips forest**, dries streams, and loads **PM2.5**. **Abandoned pits** fill with acid or become drowning traps. **Tailings** from metal mines leak **heavy metals** into rivers (the Goa iron and Odisha chromite stories are old and still live). **Blasting** cracks houses. **Illegal rat-hole** coal in the Northeast has killed workers. **Silica and asbestos** dust is a lung sentence. **Sand mining** lowers riverbeds and invites floods. **Offshore** spills are rarer but ugly. Hazard is **cumulative**: a coal block plus a washery plus a plant.

- **People:** Adivasi land under **PESA and FRA** is often the same land as the mineral. A hazard that is only counted in tonnes of overburden has missed the human dump.

Remedies

EIA and public hearing that are not theatre. **District Mineral Foundation** money that actually builds schools and water, not statues. **Scientific mining**: benches, progressive **backfilling**, topsoil save, **zero untreated discharge**. **Mine closure plans** with a **financial assurance** that is real. **Satellite and drone** watch on illegal leases (IBM, State DGMs). **Coal gasification and washeries** if they cut transport ash - not if they are a new polluter. **Just transition** for workers when a pit dies. **No-go forests** that stay no-go.

Remedies fail when a **clearance is a purchase**. They work when a **State pollution board can shut a conveyor**.

Flow diagram

Mine -> Dust acid forest loss

Dust acid forest loss -> People FRA

EIA DMF closure DMF closure -> Mine

Enforce boards drones -> Dust acid forest loss

Conclusion

Mining wounds land, water, air and forest communities. Law already names EIA, **DMF**, closure bonds and forest rights. The remedy is to enforce those tools and to leave some deposits in the ground.

Facts & figures

DMF

District Mineral Foundation, created so a share of royalty funds the mining-affected people in that district.

Hasdeo Arand

A much-debated Chhattisgarh forest-coal landscape where ecology, Adivasi consent and energy demand collide.

Mine closure

A mandatory plan to restore or secure a pit when extraction ends, often weakly funded in practice.

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