

MONITORING AND EVALUATION MECHANISM AND TRACKING METHODOLOGIES IN EI SECTOR-COAL MINING

V.K. PANDEY

E-mail: vkpandey.cmpdi@gmail.com

COAL MINING IN INDIA

Coal is intrinsically linked to India's economic growth and it contributes positively in many fundamental ways.

Over half a million people are employed by the coal mining sector and some 10 - 15 million people benefit indirectly from coal through social programmes near mines.

Also, the coal industry employs hundreds of thousands of people, as do coal-fired power plants across the country.

Coal Sector have provided roads, homes and water when local governments have been negligent.

IMPORTANCE OF COAL

Journey of coal has been replete with ups and downs.

Coal got its lease of life due to the Industrial Revolution in the U.K., in the 1760s.

Coal mining in India began soon after in the 1770s in the Raniganj coalfield.

The earlier mines were owned by British firms, private players and railways.

Small scale mining operations continued until the 1950s when the NCDC was formed.

Oil shock of the early 1970s and the imperative of growth, forced the then government for nationalization with the aim to end the slaughter mining.

PRECAUTIONARY APPROACH- SUSTAINABLE COAL MINING

- ▶ **Coal block boundary formation away from**
 - ▶ National Parks
 - ▶ Wildlife sanctuaries
 - ▶ Environmentally sensitive zone
 - ▶ Animal corridors
 - ▶ Major hydrologic regime
 - ▶ Other sensitive areas like biosphere reserve *etc.*
- ▶ **Mine planning integrating environmental and social concerns**

COAL MINING-ENVIRONMENTAL FRAMEWORK

- ▶ **Federal environmental framework**
- ▶ **Forestry clearance if forest land is involved**
- ▶ **Environmental clearance by Central or State agencies based on pollution threshold**
- ▶ **Wildlife Clearance**
- ▶ **Consent to establish/operate by State Agencies**
- ▶ **Authorisation of hazardous waste/biomedical waste**
- ▶ **Mine closure (progressive and final mine closure plan)**

OUTCOME OF ENVIRONMENTAL CLEARANCES

- ▶ **Environmental clearance conditions for compliance**
- ▶ **Compliance of environmental norms**
- ▶ **Forestry Clearance conditions for compliance**
- ▶ **Wildlife conservation**
- ▶ **Compliance of permits from State Government (Consent to Establish/Operate)**
- ▶ **Reclamation/restoration of degraded mine sites**
- ▶ **Mine closure activities**

ENVIRONMENTAL PERFORMANCE INDICATORS

- ▶ Environmental quality in terms of air, water and noise
- ▶ Land management of degraded mine sites
- ▶ Ecological parameters viz. biodiversity index
- ▶ Compliance of regulatory permits viz. environmental, forestry clearance and State level permits
- ▶ Creation of social infrastructure
- ▶ Mine Closure activities

REPORTING FRAMEWORK

Sl. No.	Monitoring Component	Reporting Framework
1	Compliance of Environmental Clearance Conditions	Six Monthly
2	Monitoring of environmental norms like air, water and noise quality	Fortnightly
3	Compliance of Forestry Clearance Conditions	Yearly
4	Permits from State Government	Yearly
5	Compliance of Action Plan arising out of Public Hearing/Consultation	As per action plan
6	Reclamation/Restoration of degraded mine sites	As per Mine Closure Plan
7	Mine Closure Activities	As per Mine Closure Plan

RECENT DEVELOPMENTS

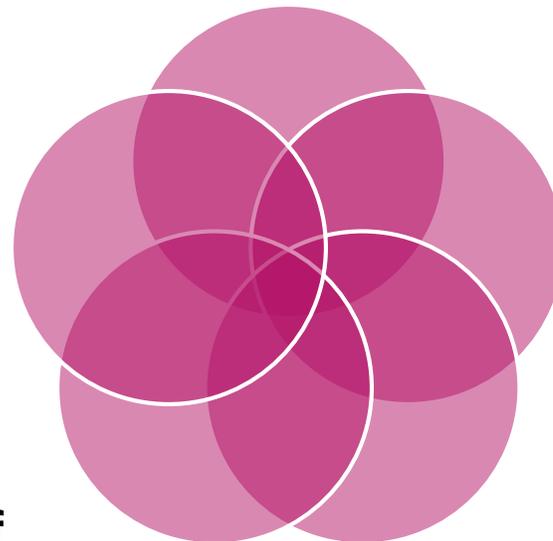
**Water footprint
of coal mines**

**Improved
post-mining
land usage**

**Energy
efficiency**

**Carbon
footprint of
coal mining**

**Restoration
of ecology
and
biodiversity**



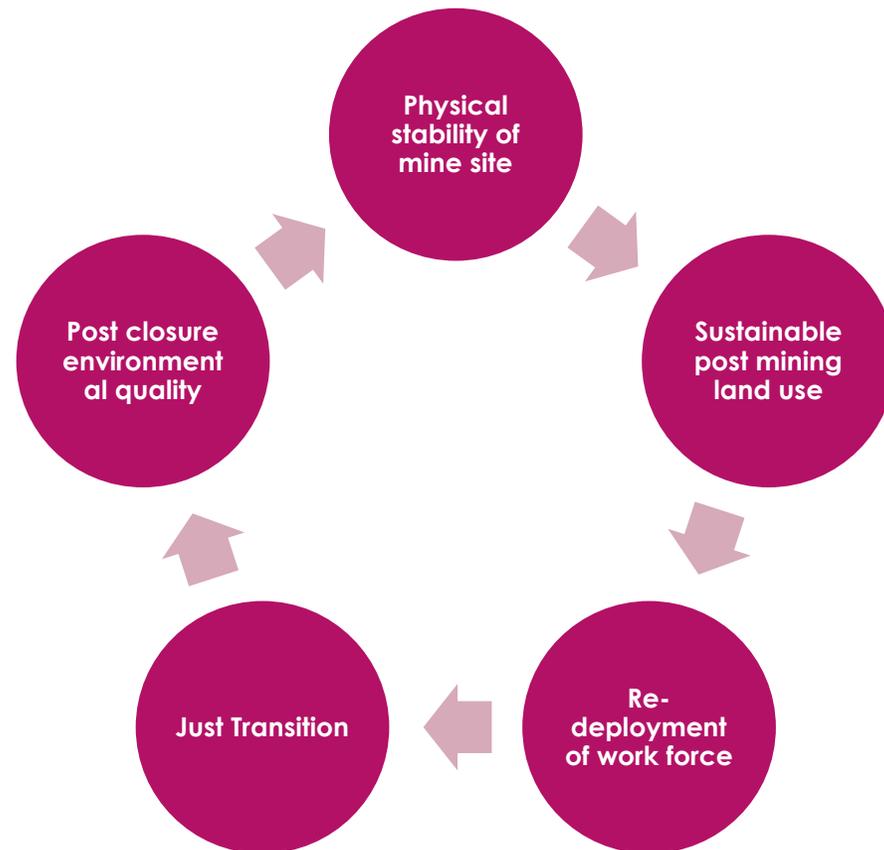
RESTORATION OF MINE SITES

- ▶ **Technical and biological reclamation undertaken sequential with mining**
- ▶ **Major projects being monitored through remote sensing every year**
- ▶ **Restoration of ecology and biodiversity an important component of restoration as India is signatory to Convention on Biodiversity**
- ▶ **India, being signatory to UNCCD, efforts are on to link the reclamation efforts with overall monitoring of rehabilitation of degraded lands across India.**
- ▶ **Reclamation/restoration being reported as compliance of environmental permits.**

WATER CONSERVATION IN COAL MINES

- ▶ On account of mining, mine pit lakes automatically gets created
- ▶ Acts as infrastructure for conservation of mine water
- ▶ Mine water in general is of good quality
- ▶ Helps to ensure water security around mine sites
- ▶ Supplied to local community for drinking, domestic use and irrigation
- ▶ About 650 million m³ of water gets generated annually in CIL

MINE CLOSURE



INDICATORS OF SUSTAINABLE COAL MINING

- ▶ Reclamation and restoration of mine sites
- ▶ Environmental quality as per prescribed norms
- ▶ Comprehensive mine water management and its reuse
- ▶ Compliance of statutory prescriptions and its reporting
- ▶ Avoidance of material transport through roads
- ▶ Appropriate R&R, intensification of CSR activities in and around mines
- ▶ Mine Closure; Link post closure with sustainable income generation to community

BROAD AUDIT PARAMETERS

- ▶ **Compliance of statutory prescriptions**
- ▶ **Compliance of environmental norms**
- ▶ **Sustainable mine closure**
- ▶ **Actions towards NDC Commitment**
- ▶ **Compliance of respective activities as per UNCCD**
- ▶ **Efforts towards restoration of ecology and biodiversity, as per CBD commitment**



THANK YOU