

# RICH LANDS, POOR PEOPLE: THE SOCIO-ENVIRONMENTAL CHALLENGES OF MINING IN INDIA

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## *ABSTRACT*

*India is a mineral-rich country. It has a vast geological potential of over 20,000 known mineral deposits, and is in the top ranks in production of some key minerals such as coal, iron ore, chromite and bauxite. According to the Geological Survey of India (GSI), the national exploring agency, the country is yet to tap its complete potential: it has huge reserves of important minerals awaiting exploration and exploitation. Unfortunately for India, almost all its minerals are in the same regions that hold its greenest forests and most abundant river systems. These lands are also largely inhabited by India's poorest and most marginalised people – the scheduled tribes and scheduled castes – who depend on the very same forests and watersheds for their survival. Mining in India, therefore, is not a simple 'dig and sell' proposition as it is made out to be by industry. It is, in fact, a highly complex socio-economic and environmental challenge: at stake are natural resources as well as people – forests, wildlife, water, environmental quality and livelihoods. The issue at hand requires balancing the imperatives of industrialization on one hand and the ecological and livelihood security of millions on the other. It is also about the policies, norms, procedures and institutions that must be established to ensure that mining is conducted – as far as possible – in an environmentally and socially acceptable manner. It is about writing and implementing new 'environmental and social contracts' to ensure that mining not only does the least damage to ecology and environment, but also contributes to the social and economic development of the areas where it is undertaken.*

## **INTRODUCTION**

In 1993, when the National Mineral Policy (NMP) was released, there was a general sense in the country that India is not a mineral rich country and this sense was reflected in the NMP, which focused on mineral conservation and the need to meet the domestic mineral requirements.

In 2006, when the high level committee constituted by the planning commission on revising National Mineral Policy released its report to the public, the sense of mineral scarcity was replaced with a sense of

mineral abundance. This was reflected in the recommendations of the committee, which stressed the need to promote the mining industry for the international market rather than to meet the domestic demand.

As things stand today, there is a consensus among geologists that Australia, India, South and Central Africa, and South America belong to the same prehistoric land mass known as Gondwanaland and that these countries should have similar mineral resources in terms of quantity and grade. In fact, conventional wisdom in the mining sector is that India is endowed with

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large mineral resources, especially of iron ore, bauxite, stones, base metals, noble metals, and diamonds.<sup>1</sup>

Within the country, the geographical distribution of fossil fuels (mainly coal) and metallic mineral reserves is highly uneven. Coal and metallic mineral reserves are spread across central and eastern India along the states of Madhya Pradesh, Chhattisgarh, Jharkhand and Orissa, as well as some areas of Maharashtra (bordering Chhattisgarh and Madhya Pradesh) and Andhra Pradesh (bordering Chhattisgarh and Orissa). Coal is also found in Assam and Meghalaya, while lignite occurs along the Eastern Ghats in Tamil Nadu.

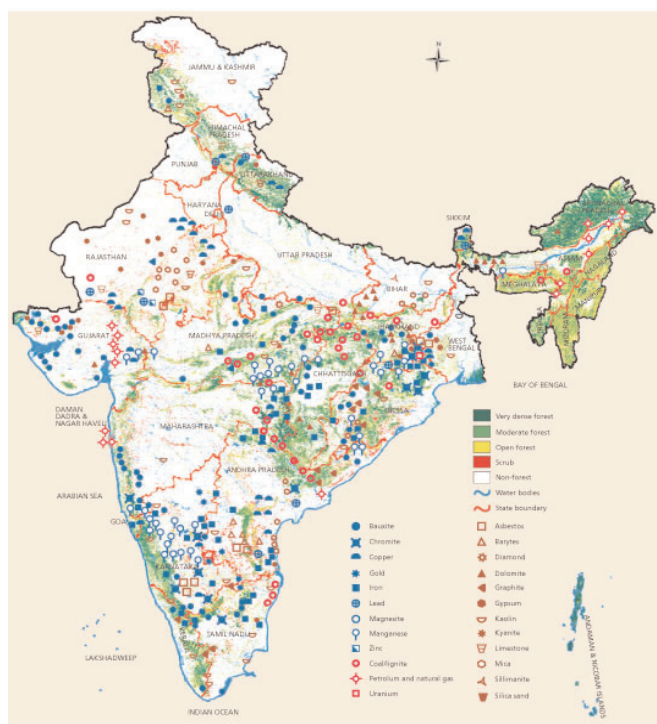
India's iron ore deposits are in Orissa, Chhattisgarh, Jharkhand, Karnataka and Goa. The deposits of copper, lead and zinc are mainly in Rajasthan, while the reserves of bauxite are concentrated in the states of Orissa, Chhattisgarh and Andhra Pradesh. Unlike coal and metallic minerals, non-metallic minerals show an even geographical spread across India. For instance, limestone deposits are spread from Himachal Pradesh in the north to Andhra Pradesh in the south and from Gujarat in the west to Meghalaya in the east.

With respect to concentration of mineral deposits, Jharkhand, Orissa and Chhattisgarh emerge as the three top mineral-bearing states. About 70 per cent of India's coal, 80 per cent of its hematite iron ore (high-grade ore), 60 per cent of bauxite, 40 per cent of manganese and almost all its chromite are found in these three states.

If all kinds of minerals, including sand, stone and brick earth are taken into consideration, then almost every district in the country can be said to produce one or other kind of minerals. However, out of the 604 districts in India, mining for fuel, metallic and non-metallic industrial minerals is undertaken in 274 districts (including 46 districts where coal and lignite are mined). Of these, 50 districts are extensively mined and produce large quantities of major minerals. These include seven districts in Chhattisgarh; six each in Jharkhand, Orissa, Andhra Pradesh and Madhya Pradesh; three each in Rajasthan, Gujarat and Maharashtra; two each in Goa and Karnataka; and one district each in Tamil Nadu, Uttar Pradesh, Assam, Meghalaya, West Bengal and Himachal Pradesh.

## MINING, FORESTS AND TRIBALS

In general, India's major mineral-producing districts are characterized by large forest covers, big tribal populations and a high incidence of poverty and backwardness (see Map 1: *India – forests vs minerals*). The average forest cover of the 50 major mineral-producing districts stands at 28 per cent; the total forest cover in



Map 1: India – forests vs minerals

these districts is 11,890,400 hectare (ha) – 18 per cent of the total forest cover in the country. Six of these districts have forest cover more than 50 per cent of their geographical areas. Of the 50 districts, about 62 per cent have a forest cover that is more than the national average of 20.6 per cent. The districts where forest cover is less than 10 per cent are – usually – either those where mining has been going on for a long time or those that are located in arid and semi-arid regions. Districts like Dhanbad in Jharkhand, Jajpur in Orissa and Bardhaman in West Bengal fall in the first category: long years of mining have devastated their forests. In the second category are districts like Kutchh, Jamnagar and Amreli (in Gujarat) and Bhilwara (Rajasthan).

Barring Gujarat, the forest cover in the remaining top five mining states – Andhra Pradesh, Orissa, Chhattisgarh, Jharkhand, and Madhya Pradesh – is

above the national average. Chhattisgarh has the highest forest cover: around 43 per cent. Jharkhand has forests on 30 per cent of its land, while Orissa and Madhya Pradesh have forest cover on 27 and 26 per cent of their lands, respectively.

Mining and quarrying has destroyed large tracts of forest land in the country. One estimate by the government puts the total forestland diverted for mining between 1980 and 2005 at 95,003 hectares (ha). Other sources point to a much higher figure of 1,64,610 ha. Even this figure would be higher if it took into account the forest land diverted before 1980 when many coal mines took over vast areas of land – mostly forests. Examples are Hazaribagh and Dhanbad in Jharkhand and Bardhaman in West Bengal.

Whatever the statistics say, it is clear that mining in forest land has increased significantly in the last decade. In the 17 years before 1998 (1980-97), forest clearances were granted for only 317 mines with a total diversion of 34,527 ha. Between 1998-2005, the Ministry of Environment and Forest (MoEF) cleared 881 mining projects in forest areas diverting 60,476 ha of forest area. This means that during 1998-2005, on an average, 216 mining projects were granted forest clearance annually – as against 19 clearances annually during 1980-97. Similarly, the total forest area diverted annually for mining during 1998-2005 is four-fold higher than what was diverted every year during 1980-97. This is an extremely worrying trend, since the mining industry has just begun expanding: with the new mining policy on the anvil, which is likely to give a significant boost to the industry, much more forest land is likely to be diverted for mining.

What makes things especially complicated for India is its large tribal population – numbering 84.3 million – which is approximately above eight per cent of its total population. Most of these tribes inhabit lands that are mineral-rich. Of the 50 major mining districts of the country, almost half are tribal districts.

As most tribals also inhabit forest areas, their livelihoods and economy are closely intertwined with the fate of the forests and water sources. According to the Forest Survey of India, Dehradun, the average forest cover in tribal districts of the country is 37 percent, which is 85 per cent more than the national average.

Forest degradation due to mining and other development projects has significantly depleted the ecosystem, rendering the tribal population more socially and economically vulnerable. The impact, naturally, has been disproportionately higher on these already poverty-stricken and marginalised people. The problem is likely to get more acute as the government continues its industrialisation drive, pegged at exploiting its vast natural resources – without investing much thought or action in safeguarding its people and environment.

One of the fallouts of this insensitive policy towards tribals has been the rapid rise of Naxalism in the mineral bearing areas of the country. A large part of the country's mineral-bearing areas is in the grip of Naxalism: 40 per cent of the mineral-rich districts in the top six mineral-producing states are affected by the movement, which is opposing the mining industry. The militant opposition has unnerved the mining industry. A report by the risk management consultancy, Hill and Associates based in Hong Kong terms Naxalism as a "grave operational risk affecting investment climate in the core extractive sector". The report also feels that Naxalism is likely to affect foreign direct investment in the country. "The risk exposure would be greater in pockets where Naxalites have joined the tribals in opposing project-induced human displacement... Areas where industrialization is in the initial stages of development are more prone to stiff opposition by Naxalites," it says.

The convergence of the interests of the tribals and the naxalites are because of one simple reason: mining has failed to bring prosperity to the mining areas – in fact, many would argue that it has bought poverty instead of prosperity.

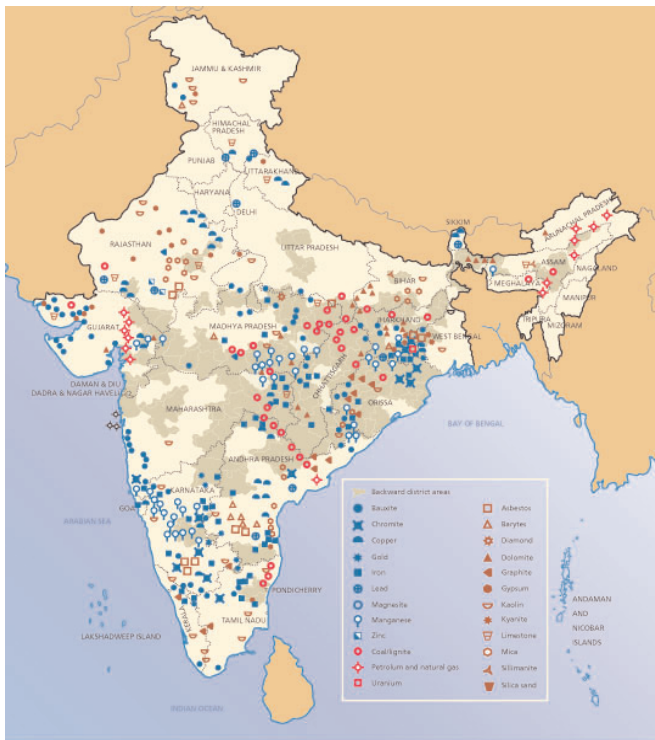
## **MINING AND POVERTY**

Across the world, the mining industry has been hard-selling dreams – of development, employment and growth. It has consistently tried to project a pro-people image by promoting the idea that mining will unleash growth in backward areas and will pull the indigenous communities into the 'mainstream', thereby improving their lives and livelihoods. But has it really done so?

At the macro level, things appear to be different. States like Jharkhand, Chhattisgarh and Orissa that have a high level of dependence on mineral resources

demonstrate low per capita incomes compared to states, which do not depend completely on their mineral wealth (examples are Tamil Nadu, Maharashtra and Gujarat). The mineral dependent states also have higher levels of poverty, lower growth rates and higher levels of mortality, malnutrition and morbidity. India is not the only country where mining is linked with poverty and poor development outcomes. In most nations of the world, a high level of mineral dependence is associated with retarded economic performance. This phenomenon is so widely and commonly observed that it has been given a name – the ‘resource curse’.

Resource curse is very much a reality in the mineral-rich areas of India. Of the 50 major mining districts, 60 per cent figure among the 150 most backward districts of the country (see Map 2: *Poverty amidst plenty*).



**Map 2: Poverty amidst plenty**

Four of these mining districts – two from Orissa and one each from Jharkhand and Chhattisgarh – are among the top 25 backward districts of the country; 13 of these districts figure in the top 50 backward districts of the country. A closer look at a few districts gives a

clearer picture of the phenomenon of resource curse:

- Keonjhar, the most mined district of Orissa and the centre of its iron ore production, has quite a few dubious distinctions to its credit. Its infant mortality rate is 20 per cent higher than the state’s average. About 60 per cent of its population lives below the poverty line and its per capita district domestic product is one of the lowest in the state. According to the 2001 census, the percentage of rural households with access to safe drinking water in Orissa was 63 per cent; in Keonjhar, the percentage was a meagre 39 per cent.
- Dantewada is fast emerging as the most favoured destination in Chhattisgarh for steel companies due to the presence of high-grade iron ore. It ranks seventh among the 150 most backward districts in the country. Only about 22 per cent of the households in Dantewada have power connections. Provisions for safe drinking water are available for only half of the households (53 per cent), much lower than the state average (71 per cent). Only one-third of the population is literate – once again, lower than the state average.
- Gulbarga and Bellary are two key mining districts in Karnataka. While Bellary is the hub of iron ore mining, accounting for 84 per cent of the iron ore produced in the state, Gulbarga is the largest producer of limestone in the country. Both these districts fare poorly when it comes to human development. Gulbarga is ranked 19th and Bellary 17th out of the 20 districts of Karnataka on the human development index (HDI). Although Bellary boasts of the largest number of private aircrafts in the country, more than 45 per cent of its population lives below the poverty line. The district does not even have the basic amenities – only about 41 per cent of its households have access to power. The infant mortality rate is much higher than the state’s average and life expectancy is lower. Less than 50 per cent of the population of Bellary is literate. The scenario is similar in Gulbarga, where the rate of literacy is as low as 38 per cent. Poverty is rampant with 45 per cent

- population below the poverty line (the state average is 33 per cent). Only 63 per cent of the households in the district have access to safe drinking water, while 45 per cent have no power connection.
- Both the mining districts in Maharashtra – Yavatmal and Chandrapur – not only figure among the 150 most backward districts of the country, but are also ranked 34th and 26th, respectively, out of the 35 districts of Maharashtra, on the HDI. Chandrapur, the largest producer of coal and limestone in the state, has only half of its villages linked by pucca roads, while only 43 per cent of households have access to safe drinking water. Health facilities are poor, with the infant mortality rate as high as 106 compared to the state average of 74. The per capita income of Chandrapur is more than 20 per cent lower than the state average; about 47 per cent of the families in the district are below the poverty line. Yavatmal leads in coal production, but lags behind in all other aspects. Around 44 per cent of families in the district are below the poverty line. Less than half the households have access to safe drinking water. The rate of infant mortality is 1.7 times more than the state average, while per capita income is 1.8 times lower.
  - Rajasthan is one of the leading non-metallic mineral-producing states of the country. Udaipur and Bhilwara are the key mining districts: the mining industry contributed 31 and 25 per cent to Udaipur and Bhilwara's GDP, respectively, between 1998-2001. But as is the case with the other states, both these districts have failed to benefit from their mineral wealth. The per capita income of Udaipur is lower than the state average. Only 32 per cent of villages in the district have access to power, while 64 per cent get safe drinking water. About one-third of the district's population is below the poverty line. Udaipur has been ranked 27th out of 29 districts in the state in terms of HDI. Bhilwara fares poorly too – with only 32 per cent of its villages with access to power and 60 per cent with access to safe drinking water. Almost half the population in the district is below the poverty line, and literacy rate is only 50 per cent.
  - Cuddalore, in Tamil Nadu, produces three-fourths of India's lignite. Groundwater near the lignite mines here has been depleted, leaving local agriculturists high and dry. More than half of Cuddalore's population lives below the poverty line and it is ranked 16th out of the 30 districts of Tamil Nadu in HDI.
  - Sonbhadra is the most mined district of Uttar Pradesh. It produces more than 20 MT of coal every year, apart from thousands of tonne of limestone and dolomite. It is also one of the most backward districts of the state. About 55 per cent of its population lives below the poverty line and its literacy rate is less than 50 per cent.
- The story is similar across the country as far mineral districts and poverty is concerned. Despite the tall claims of industry as well as government, mining does not seem to usher in prosperity and development; in fact, under the current policies and practices of the government, mining districts have actually slipped deeper into poverty and destitution.
- Today across the mineral belt of the country, people are protesting against mining. They don't want to give their land for mining. Apart from false promise of development, one of the major reasons for this is that mining has the worst track record as far rehabilitation and resettlement (R&R) is concerned. To start with, there are no reliable figures on how many people have been displaced by mining. There are estimates available for the period 1950 to 1991, which show that of all the developmental projects, mining has displaced the second highest number of people - around 25.5 lakh people. More importantly, not even 25 per cent of these displaced have been resettled. Of all the people displaced by mining, about 52 per cent were tribals. Mining-induced displacement and resettlement has therefore created a pattern of "gross violation of human rights," and "enormous trauma in the country".
- It is important to recognise the protests of people, against mining, for what they are: people in the mineral-rich areas of the country are not willing to give up their land for mining. They do not believe that mining is going to improve their lot or add to the development of their regions. A history of poor compensation and poorer R&R

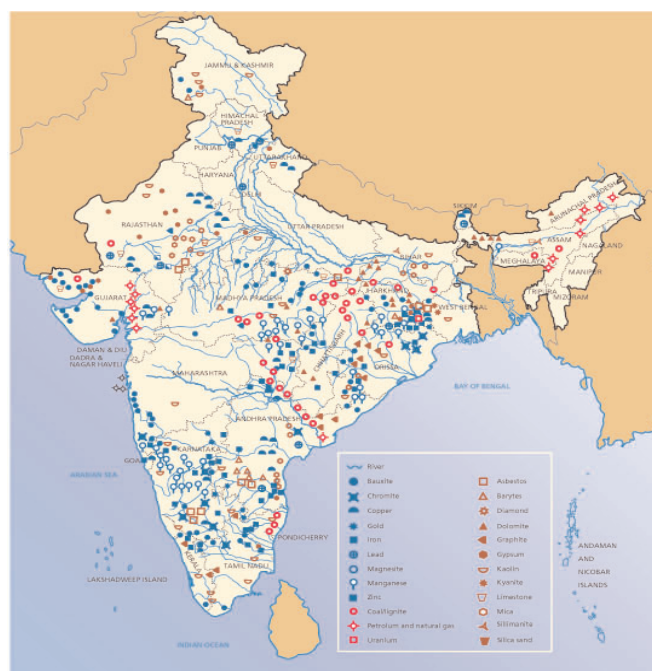
has created an atmosphere of acute distrust. People do not trust the government and businesses, who they believe are hand-in-glove. And they are not far from the truth: the current paradigm of R&R is flawed and ensures nothing but impoverishment and social disruption.

## MINING AND ENVIRONMENT

Mining takes a huge toll on the environment. The intensity of the environment impact depends on what is being mined, where and how. Unless it is meticulously planned and carefully executed, mining can devastate lands, pollute and deplete water, denude forests, wipe out wildlife, and defile the air. Unfortunately, the environmental performance of Indian mining industry has been quite poor.

In the last decade there has been general recognition of the fact that mining has huge impact on the water resources – not so much due to consumptive use, but rather due to alteration in the hydrological profile of the area and due to pollution. Across the mining areas of the country, people are feeling the impact of water scarcity and pollution due to mining. Whether it is iron ore in Goa or Karnataka, bauxite in the hills of Chhattisgarh or Orissa, coal in Jharkhand, Orissa, West Bengal or Madhya Pradesh, or limestone and magnetite in Uttarakhand, open-cast mining has and is playing havoc with the water resources. Rivers like Damodar in Jharkhand and West Bengal, Bhadra in Karnataka, Indravati in Chhattisgarh and Brahmani in Orissa are clear examples of water pollution due to mining. If the current trend of mineral exploitation continues unabated, some of the major rivers in the country run the risk of disappearing as most of the minerals in the country are also found in watershed and catchment area of some major rivers (see Map 3: mined rivers). There have been several instances when the local community had to face hardship as mining operation changed the hydrological regime due to breaching of groundwater. About 40 per cent of large-scale limestone mines of the country have breached the groundwater table.<sup>2</sup>

Mining operations also generates so much of fugitive dust that it often gives monochromatic appearance to the mine areas. Coal mining areas are black, bauxite and iron-ore rich region red, while limestone gives a chalky white hue. Korba, Bhilai, Satna and Dhanbad



Map 3: Mined rivers

have been declared critical by the Central Pollution Control Board with respect to both suspended particulate matter (SPM) and respirable particulate matter. The iron ore mines and association transportation in Keonjhar-Sundargarh belt in Orissa and Bellary in Karnataka have defiled air in the region. Air pollution in old coalfields of Bokaro, Jharia and Raniganj has reached such levels that Central pollution Control Board (CPCB) has set 40 per cent higher ambient air quality standards for these areas as compared to new coal mines. The dust from the mines not only affects the health of the workers and local residents but also affects the agricultural productivity of the area. This has been found in Ib coalfields in Orissa, Bellary-Hospet region in Karnataka and Udai Sagar, Khamli and Chitor regions of Rajasthan through various studies.

As high grade deposits are getting exhausted, mineral industry are taking a recourse to lower grade reserves generating more wastes. For example, in beginning of the 20<sup>th</sup> century, copper ore mined by US mineral industry consisted of about 2.5 per cent of usable metal by weight, today, the proportion has dropped to 0.51 per cent.<sup>3</sup> Similarly, Indian coal companies are digging deeper and deeper to extract lower grade coals generating as much as 15 tonnes of waste to extract one tonne of coal.<sup>4</sup> In 2005-06 alone, the total

waste generated from some major minerals alone amounted to as much as 1841 million tones. And the volume of waste is only growing.<sup>5</sup> Unfortunately, the track record of Indian mining companies in managing its waste has been rather poor. In 2006, six workers were killed when iron ore mining waste dumps collapsed in the Tollem mines in Goa.<sup>6</sup> Run off from overburden dumps have polluted river courses such as in Goa and in some cases even poisoned water resources as in Sukinda valley of Orissa.

However, the most serious concern for the mining industry is of mine closure. The environmental and social cost for rehabilitating the abandoned mines the world over is likely to run in trillions of dollars. A recent estimate puts rehabilitation costs just in the US, where regulation is much stringent than many other countries including India, at US\$50-60 billion.<sup>7</sup> India does not have a detailed inventory of abandoned mines. According to the website of Indian Bureau of Mines and reports from ministry of coal, there are 510 officially abandoned mines of major minerals and coal. However, unofficially this figure is likely to be much higher as it does not account for hundreds of mines being closed every year.

The information on mine rehabilitation in India is as sketchy as that on abandoned mines. According to the annual report of Union ministry of mines, as of September 2005, only 53 mines have been reclaimed covering an area of 660 ha. The truth is that mine rehabilitation is a completely ignored area in the country. It was only in 2003 that a mine closure plan was made mandatory for major minerals. Coal mines are still exempted from submitting a mine closure plan. Even the new regulation are a mere formality. Most of the mine closure plans today are nothing but huge pits disguised as water bodies/water harvesting structures and massive overburden dumps disguised as plantations. The Green Rating Project of Centre for Science and Environment found during the environmental rating of large-scale cement industry that nearly all companies (with captive limestone mines) were not following proper mine closure programme.

## **REGULATORY ROADBLOCK**

Though several legislations are in place to reduce mining's socio-economic impacts, they have not been

codified clearly. The environmental law especially tailored for mining under the Mineral Conservation and Development Rules, 1998 is a two page benevolent statements, which treats every mines as a special case and leaves ample scope for interpretation by the mine owners. For example, it says "*wherever possible*, the waste rock, overburden should be backfilled into the mine excavation with a view to restoring the land to its original use *as far as possible*". The rules also says that trees cut down to make way for mining have to be replaced by double their numbers. However, there is no mention of the type of afforestation to be done. There are several such examples of ambiguity in the said legislation.

There is also an institutional confusion about who is responsible for what. Both the Indian Bureau of Mines and the state pollution control boards are responsible for monitoring the environmental aspects of monitoring. The IBM is supposed to clear the mine plans and closure plans but it the Union ministry of environment and forests, which clear s the environmental impact assessments. SPCBs monitors the air and water pollution. IBM is responsible for waste management, reclamation and plantation, and SPCBs have nothing to do with it. Moreover, both IBM and SPCBs do not have enough manpower to monitor even large-scale mines, let alone small and medium scale mines.

Mines require forest and environmental clearances from the Central government. On paper, this seems to be an excellent way of preserving forests and safeguarding the environment. However, today, mining is happening in every ecologically sensitive area one can think of – in and around reserve forest, wildlife sanctuaries and protected areas. The only saving grace has been the intervention of the apex court in halting mining and other developmental projects in national parks and wildlife sanctuaries. But legislatively, there is no moratorium in mining in any area of the country – be it an ecologically fragile area, wildlife sanctuaries, reserve or protected forests, biosphere reserves, national parks, critical water sources or areas inhabited by indigenous communities.

One of the biggest challenges for the lawmakers is to include safeguards in the closure legislations to ensure sustainable closure of mines. One of the key

roadblocks before sustainable closure is the availability of funds at the end of life of mine. The financial assurance required by the Indian regulation is a pittance. A 10 sq km mine lease area has to pay a surety of just Rs 2 crores though the annual turnover of a large mine may be in thousands of crores every year. The provision of forfeiting of the financial assurance is not a deterrent to the erring companies. Neither is there any system to blacklist the company for non-compliance. Another drawback of the closure regulation is the quality of mine closure plans. Most of the closure plans do not discuss alternate land use but rather focus on easier options like developing water bodies. There is also no mention of pollution control or remediation in closure plans even when there are tailings and acid mine drainage. The closure plans fare worse when it comes to socio-economic front even though a notification from IBM has made it an integral part of mine closure plan. The environmental clearance process has also several lacunae, one of the biggest being that the EIA report is prepared by a consultant hired by the company. Public hearings, an important platform for people to raise their concerns, have become a mere formality.

All these regulatory roadblocks have to be addressed to ensure better environmental management of the mines in the country.

## CONCLUSIONS

The term sustainable mining is an oxymoron. Mining cannot be sustainable as ore bodies are finite and non-renewable. Even the best-managed mines will have environmental impacts. These are some of the inevitabilities that we have to reconcile with. However, another undeniable fact is that humans have used minerals from time immemorial and will continue to do so in the near future. Our dependence on minerals is so great that we cannot wish away mining. Therefore, the issue is not whether mining should be undertaken or not but rather how it should take place. It is necessary that mining should be conducted in an environmentally and socially acceptable manner so that it leads to least ecological damage and also contributes to social and economic development of the areas.

Some of the new paradigm which mining companies need to keep in mind to make it more acceptable is

to share the wealth generated by the mining with the local communities and to take people into confidence and seek their permission before initiating the mining operations. When people get the benefits from the project and are involved from the planning stage, they are more likely to be open to the project.

A major overhaul of the environmental regulations and regulatory mechanism is also needed. The EIA report must be made by an independent party with no vested interests. Public hearing, a component of the environmental clearance process, should be strengthened and given more space. Implementation of Environmental Management Plan should be monitored and a penalty imposed for non-compliance. It is very important to recognise critical ecosystems, biosphere reserves and other protected areas. Like many other countries, India too should decide 'no-go' areas for mining and other developmental projects.

There is an urgent need to codify detailed environmental management regulations for mining. Best practices such as simultaneous reclamation, collection and treatment of surface run-off, fugitive dust control, tailing waste management, etc should be adopted. There is also an urgent need to enact laws to protect groundwater and water catchment from mining. The closure regulations should be made applicable for all minerals including fuel minerals and adequate financial surety and robust regulatory mechanism should be developed to ensure companies take responsibility for mine closure.

An important thing to improve the environmental performance of the mine is to restructure and revamp the regulatory institutions. A strong monitoring and enforcement system is fundamental for ensuring environmental sustainability.

One of the fundamental principles of sustainable development is 'doing more with less'. For mining and minerals sector, this translates into reduction in the requirement of minerals per unit of material output. The requirement of minerals in the country can be met far more efficiently than it is being today. It can be achieved through waste prevention and recycling and reuse of existing material stocks. This will also require use of low-grade minerals and to promote this, right kind of economic incentives and disincentives should be put in place.

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