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The Indian Mining Sector: Effects on the Environment & FDI Inflows

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Introduction

Minerals are non-renewable and limited natural resources and constitute vital raw materials in a number of basic and important industries. The extraction of minerals from nature often creates imbalances, which adversely affect the environment. The key environmental impacts of mining are on wildlife and fishery habitats, the water balance, local climates & the pattern of rainfall, sedimentation, the depletion of forests and the disruption of the ecology. Therefore management of a country's mineral resources must be closely associated with her overall economic development and environmental protection & preservation strategy (See Box I).

India has huge mineral resources. Thus the mining industry is a very important industry in India. It only opened up to foreign investment in the 1990s, and the flow of foreign investment in the sector has been very low due to restrictions. Moreover, in India this sector is facing several challenges, which are:

- Massive investment required in exploration and the up-gradation of technology.
- Mitigation of environmental degradation due to mining.
- Adoption of environment friendly technology.
- Tackling of social issues like displacement of the population, marginalisation of local communities and economic disparities in mining areas.
- Rehabilitation of closed and abandoned mine sites.

The Government, at both central and the state level, has to address these issues by formulating appropriate policies and effectively implementing them for the overall development of the sector which is environmentally sustainable.

Box I: How Mining Affects Environment

1. *Air:* Surface mines may produce dust from blasting operations and haul roads. Many coal mines release methane, a greenhouse gas. Smelter operations with insufficient safeguards in place have the potential to pollute the air with heavy metals, sulphur dioxide, and other pollutants.
2. *Water:* The mining sector uses large quantities of water, though some mines do reuse much of their water intake. Mining throws sulphide-containing minerals into the air, where they oxidise and react with water to form sulphuric acid. This, together with various trace elements impacts groundwater, both from the surface and underground mines.
3. *Land:* The movement of rocks due to mining activities and overburden (material overlying a mineral deposit that must be removed before mining) in the case of surface mines impacts land severely. These impacts may be temporary where the mining company returns the rock and overburden to the pit from which they were extracted. Many copper mines, for example, extract ore that contains less than 1% copper.
4. *Health & safety:* Mining operations range from extremely hazardous to being as safe or as dangerous as any other large scale industrial activity. Underground mining is generally more hazardous than surface mining because of poorer ventilation and visibility and the danger of rockfalls. The greatest health risks arise from dust, which may lead to respiratory problems, and from exposure to radiation (where applicable).

Source: Sustainable Development Networking Programme (SDNP, India)

The Indian Mining Sector

The mining sector in India contributes approximately four percent to the Gross Domestic Product (GDP) and is one of the largest employers in India, employing more than one million workers which is around four percent of the Indian workforce. India produces 89 minerals, out of which 4 are mineral fuels, 11 metallic, 52 non-metallic and 22 minor minerals (See Tables I & II).

Table I: Mineral Production in India

| Mineral | Million Tonnes | | | CAGR (Compound Annual Growth Rate) (%) | | Remarks |
|------------|----------------|-------|---------|--|---------|--------------------------------------|
| | 1970 | 1990 | 1998/99 | 1970-90 | 1970-98 | |
| Iron Ore | 16.6 | 55.6 | 70.7 | 6.23 | 5.31 | 30-40% ore exported |
| Bauxite | 1.4 | 5.0 | 6.4 | 6.57 | 5.58 | 20-30% ore or alumina exported |
| Chromite | 0.27 | 0.94 | 1.4 | 6.44 | 6.05 | Ore exported |
| Limestone | 23.8 | 70.1 | 109.8 | 5.55 | 5.61 | 2% cement exported |
| Coal | 73.7 | 211.6 | 293.6 | 5.41 | 5.06 | Coking coal exported |
| Copper Ore | 0.5 | 5.2 | 4.2 | 12.42 | 7.90 | Copper metal or concentrate exported |

Source: Tata Energy Research Institute (TERI), 2001

Table II: India's Position in the World in Terms of Production

| Product | Position in World Production |
|-----------------------------------|-------------------------------------|
| Mica blocks and splitting | 1 st |
| Coal & Lignite; Barytes; Chromite | 3 rd |
| Iron Ore | 4 th |
| Bauxite; Manganese ore | 6 th |
| Aluminium | 10 th |
| Crude Steel | 11 th |

Source: Government of India, Ministry of Commerce & Industry.

In 1998-99 the total value of mineral production (excluding atomic minerals) was Rs. 404768 million (\$8390.70mn at Rs. 48.24/\$1 exchange rate). There are more than 3,500 mining operations in the country most of which are on a very small scale and 300 of which are underground in the non-fuel sector. The industry is dominated by government corporations (or Public Sector Units - PSUs as they are known in India) which employ more than 90 percent of the industry workforce. The mining sector grew at an average annual rate of 8.4 percent between 1980/81 and 1991/92 and only 3.3 percent between 1992/93 and 1999/2000 (Economic Survey 2000-01).

Effects of Mining on the Environment in India

The mining sector in India is plagued by several environmental and health- and safety-related problems. Several accidents have taken place in underground and surface mines like coal and stone mines in the last few years, which have killed scores of mineworkers. An example of environmental damage by a mining company in India is the Kudremukh Iron Ore Company Limited (KIOCL) in the Western Ghats Mountain Ranges in Karnataka State in southern India. The operations of KIOCL have caused large-scale destruction of the hills, pollution of groundwater in the neighbourhood and have severely affected the Kudremukh National Park.

Since 1973, seven mining disasters have taken place. The latest was in February 2001, when 30 miners lost their lives in an accident in the Bagdigi mines in the eastern Indian State of Bihar. Every year many mine workers lose their lives in mining accidents in India. Wide spread illegal mining and lack of effective government supervision in government and private mines accentuates the problem.

While the safety of mineworkers is the most serious problem facing the Indian mining industry, the Directorate General of Mines Safety (DGMS), who is responsible for the supervision and enforcement of mining rules is unable to do its job effectively because of a shortage of supervisory staff. The main reason for this shortage is the inability of the DGMS to fill its vacancies due to lack of funds. The miners also face health hazards arising out of on-site pollution due to dust, gases, noise, and polluted water. Health related issues are increasingly coming into focus.

One of the major environmental challenges facing the mining industry is due to the mine sites which are no longer in use. In the Jharia and Raniganj coal fields in Bihar there are more than 500 abandoned mines covering about 1800 hectares. The sites include subsided areas, excavated pits, overburdens, spoil dumps, and areas affected by fire.

Thus there are several visible and not so visible impacts of mining on the environment and these issues must be addressed for a balanced and beneficial development of the mining

sector. Most of the increase in the production of minerals will come from open cast mines in the future which would lead to a loss of large tracts of forest and agricultural land.

Environmental Legislation in India

The overall framework of environmental legislation in India is set by the National Conservation Strategy and Policy Statement on Environment and Development, issued by the Ministry of Environment and Forests (MoEF) (June 1992) which identifies the following steps in order to integrate environmental considerations into decision making at all levels:

- Prevent pollution at source
- Encourage, develop and apply the best available practicable technical solutions
- Ensure that the polluter pays for the pollution and control arrangements
- Focus on protection of heavily polluted areas and river stretches
- Involve the public in decision making.

In order to ensure that projects are adequately monitored the following requirements have been put in place:

- Investors are required to report every six months on the implementation of the environmental safeguards stipulated in the clearance by the MoEF.
- Field visits by the Central Pollution Control Board and its regional offices to collect samples and data on the environmental performance of the cleared projects.
- In cases of inadequate compliance, the issue is taken up with the concerned State governments and nodal ministries.

Till January 1994, obtaining environmental clearance from the Central Government was only an administrative requirement intended for mega-projects undertaken by the government or PSUs. However, the new notification referred to as the Environmental Impact Assessment (EIA) Notification makes an EIA statutory for 29 different activities, mining being one of them. The EIA notification also includes details of procedures for obtaining environmental clearance and for public involvement besides setting time schedules for decision taking. Under the provisions of the EIA notification under the Environment Protection Act (1986), the MoEF has to complete an assessment of an investment proposal within 90 days of the receipt of all of the information and documents. The decision is conveyed to the investors within 30 days thereafter. If the decision is not communicated within this time frame, the proposal will be regarded as having “deemed clearance”.

Changes in FDI policy and FDI Performance

In 1994, the National Mineral Policy was revised to permit private domestic and foreign investors to explore for and exploit the following minerals: iron ore, copper, manganese, lead, chrome ore, zinc, sulphur, molybdenum, gold, tungsten ore, diamond and the platinum group of metals. The objectives of the new policy were to (i) encourage large-scale private investment in the sector and (ii) achieve increased export of minerals in value added form. Initially all proposals were considered on a case-by-case basis by the Foreign Investment Promotion Board (FIPB). In 1997, the sector was further liberalised as the “automatic approval” route for FDI was opened up and foreign equity participation of up to 50 percent in mining projects and 74 percent in services incidental to mining was permitted. In February 2000, the Department of Mines reviewed the sectoral guidelines in the mining sector and made a few changes, bringing about further liberalisation in the sector (See Box II).

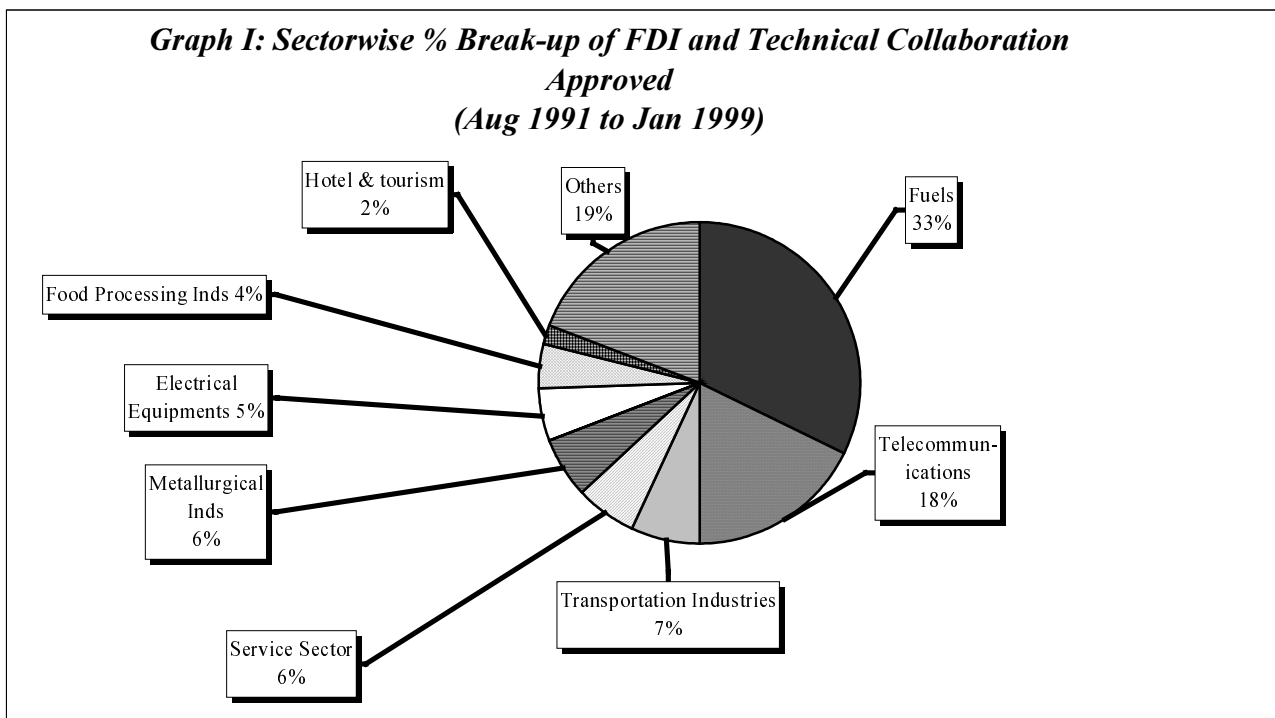
Box II: Guidelines for FDI in Mining and Mineral Sector, 2000

1. 74 percent FDI allowed in exploration and mining of diamonds through automatic route. For proposals seeking higher than 74 percent FDI, the cases will have to come to the FIPB for clearance.
2. 100 percent FDI allowed in exploration and mining of gold and silver and minerals other than diamonds and precious stones, metallurgy and processing.
3. 100 percent FDI allowed on the automatic route for processing of mineral and metallurgy.
4. For the petroleum sector the percentage FDI permitted varies from 51 percent to 100 percent depending on the type of activity. For petroleum products maximum 51 percent FDI is permitted. The automatic route is not available.
5. For coal and lignite up to 74 percent FDI permitted for the setting up of mines for captive consumption. For these cases, FDI is allowed up to 50 percent under the automatic route subject to the condition that such investment should not exceed 49 percent of the equity of a Public Sector Unit (PSU).
6. For atomic minerals up to 74 percent FDI permitted in certain activities e.g. mining and mineral separation, value addition per se to such products and integrated activities comprising these two activities.

Source: Government of India, Ministry of Commerce & Industry.

Most of the FDI proposals in the mining sector particularly in gold mining are from Australian companies. The reason is that the geological and metallogenic history of India is similar to Australia as also to South Africa, South America and Antarctica, all of which were parts of the ancient landmass: Gondwanaland. The Australian companies are hoping that the next gold rush will be in India. There are both positive and negative attractions for investors in India. On one hand, India has hardly had any intensive mining since the nationalisation of her mining sector in 1947, thus the exact quantity of mineral deposits in India is not known. On the other hand there are many positive factors like India is the largest consumer of gold in the world, making the country an attractive destination for investment for many gold companies.

Till September 2001, India had approved 70 proposals of FDI worth \$834 million in the mining sector. However actual FDI inflows in this sector are quite low compared to total FDI inflows in other sectors. While the average inflow rate for all sectors stands at around 30 percent, in the case of mining it is only 4.6 percent of the approved amount (See Graph I). Unfavourable labour laws, bureaucratic sloth and complex rules & regulations are holding the investors back. Besides, lack of proper information on the volume and quality of deposits of some minerals like gold in India do not make scale of operations profitable for large firms.



Source: Ministry of External Affairs, Government of India

The Central Government is taking new measures and stressing the effective implementation of existing policies to improve the foreign investment environment in the sector. Foreign investors are also responding favourably. Even after changes in the guidelines in 1994, foreign investors were not keen to invest in the Indian mining sector until in 1999, when foreign exchange rules were changed allowing repatriation of profits. Some other measures have been proposed:

- i. The Central Government, which now has only a facilitating and coordinating role is planning take up procedural issues which hold up investment in the sector with the State Governments. The State Chief Ministers would be urged to intervene in cases where minor obstacles came in the way of project implementation.
- ii. The Central Government has also asked the State Governments to act against criminal elements to check illegal mining and ensure the safety of the workers in the mines.
- iii. There is also a proposal to set up an exclusive regulator for this sector for overall improvement and better functioning. Right now there is only a tribunal constituted by Government representatives.
- iv. Steps are also being taken to boost FDI inflows in the sector by identifying the difficulties faced by foreign investors. One is to provide a level playing field for companies seeking to prospect for minerals such as gold and diamonds.
- v. The Government is also working on plans to turn around loss making companies by adopting clear and time bound direction and effective policies. The Government has, however, ruled out retrenching mineworkers, as wages constitute only a small fraction of the total losses of mining companies.

“Pollution Havens”

It has been seen that the poorest countries receive a disproportionately high share of resource seeking investment, which has profound impacts on the development paths of these countries. Production in sectors such as mining is characterised by high capital intensity and economies of scale. The host countries may receive a few spill over benefits because of these factors but they also pay a high cost. There could be misallocation of the scarce natural resources, environmental damages and displacement of local small producers.

Much of foreign investment in the mining sector in developing and less developed countries is by Transnational Companies (TNCs). It is alleged that in the search for new sources of capital, labour and raw materials, TNCs relocate their firms in “pollution havens” where environmental regulations are lax. While it is difficult to determine whether the level of environmental regulations in developing countries affects FDI flows, there is some evidence that “pollution havens” do exist with certain types of firms operating in specific industries, including mining in particular countries. The reason is that for mining companies, pollution control costs can make up a significant proportion of the companies’ total costs. So small cost differences can translate into large changes in the market share and profitability. Therefore these companies are more susceptible to the level of environmental costs, and therefore are more likely to invest in “pollution havens”. Countries in the Asia Pacific region e.g. Papua New Guinea and Indonesia have allegedly lowered their environmental standards to attract FDI in the recent past (the “race to the bottom” phenomenon).

There are instances of companies, which did not invest for reasons of environmental standards, putting pressure on host developing countries to lower environmental regulations, or prevent their enforcement. Examples include Shell’s oil drilling in Nigeria and Freeport’s mining operation in Indonesia.

The Indian mining sector however was closed to foreign investors till 1994. Even after the liberalisation of the sector, very few TNCs have invested in India. However steps to liberalise the sector to attract higher volumes of FDI are still being taken. The Government must be careful. While inviting foreign investment, it should keep a constant vigil of the activities of the companies that are coming in, and prevent any potential damage to the environment.

There are a few instances of mining TNCs endangering the environment by their activities in some states in India with the complicity of the respective Governments. In Orissa, eastern India, TNCs in the Bauxite sector have displaced the tribal population (or *adivasis*) from their homeland and polluted one of the state’s most important rivers by discharging effluents. It is alleged that TNCs are even indulging in extortion to grab land while the Orissa Government is doing nothing to protect the environment and the *adivasis*’ land. The *adivasis* are accusing the Orissa government of openly supporting the TNCs. The media, civil society and other stakeholders of society have a very important role to play in monitoring the activities of the Government and preventing such cases from happening.

Measures to Protect the Environment

Advanced technology, automation and globalisation of mining industries has changed the mining sector around the globe. In many countries responsible mining companies have demonstrated their commitment to protecting and upgrading the environment while improving their performance standards. There are instances where mining companies have adopted the best practices used in other industries, leading to improvements in productivity, safety, and

environmental protection. In India also, many large mining companies have adopted environment friendly practices (See Box III).

Box III: Examples of waste utilisation in India by large Mining Companies

1. The National Mineral Development Corporation is setting up a 0.3 million ton pig iron plant for the utilization of tailings.
2. The Kudremukh Iron Ore Company has formulated a project to reclaim 117 million tons of tailings to recover 21 million tons of concentrates.

Source: TERI, 2001

More and more companies must be encouraged to adopt practices and technologies, which are healthy for the environment and ensure the safety of miners. The future direction that must be followed by the mining companies is as follows:

1. Resource conservation and management by scientific and rational utilisation with minimum waste in extraction, finding substitutes of the minerals widely used at present, proper & judicious recycling of used metals and scraps and discovery of new deposits
2. Adoption of environmental friendly technologies
3. Efficient use of energy
4. Afforestation and preservation of biological diversity

Another angle is environmental clearance of FDI proposals. The MoEF has recently taken several steps to speed up the process of clearance for mining projects, as demanded by investors (See Box IV). The MoEF has stated that compliance by the mining companies with the environmental stipulations would improve in days to come. Analysis has shown that compliance has been quite unsatisfactory in the following areas: construction & maintenance of garland & check dams, plantation on inactive waste dumps, fugitive dust control, rehabilitation of families affected by projects, treatment of water before discharge and green belt development.

Box IV: Measures to Simplify Procedures of Environmental Clearance of Mining Projects

- Deficiencies in EIA and the Environmental Management Plan (EMP) are being identified so as to facilitate, wherever necessary, early submission of additional information by investors.
- A checklist has been prepared to help investors in the documentation procedure.
- Manual for EIA appraisal has been brought out. The MoEF feels that this would be a useful reference for appraising agencies, regulatory authorities, entrepreneurs and consultants.
- Decisions regarding sanctioning a mining project would be made as fast as possible.
- The status of projects posed for clearance would be displayed on the MoEF's website and updated fortnightly.
- Guidelines would be used to determine the scope of EIA and the EMP for each mining project.
- Guidelines would also be evolved for the collection of data for key resources such as surface water, ground water, flora and fauna, land use, meteorology and air quality.

Source: SDNP Delhi; The Business Line, November 28, 2001

Policy Implications

According to senior officials in the Ministry of Coals and Mines, the situation on mining leases has improved considerably, but foreign investment in the mining sector has been delayed by two to three years after it was opened to foreign investment five years ago. The different ministries of the Central Government have taken measures to improve FDI inflows in the mining sector, speed up environmental clearance of foreign and domestic investment proposals and effectively implement environmental legislation. Some other measures could also be taken, such as:

- The Government should not permit mining operations in ecologically sensitive & rich areas and environmentally & biologically fragile areas. It should map such areas and ban mining in these areas and prepare another list of areas where mining is permitted.
- Wastelands generated by mining activities should be used productively, and for this purpose plans should be made and implemented effectively. A Reclamation Trust Fund or a Performance Guarantee Bond could be established as in many other countries, to use wastelands and revive degraded lands.
- Old and abandoned mines should be rehabilitated and put to productive use by the Government. Levying a cess on mineral production could finance this.
- There should be a well formulated and effectively implemented mine closure policy by the Government.
- Environmental laws must be implemented effectively and polluting mining companies must be punished.
- Effective environmental regulation and safety and health inspection of small mines should be in place. The Government could bring out some guidelines on this.
- The participation of stakeholders like mine workers, consumers, local residents, environmental organisations and other members of civil society would help in the effective implementation of environmental laws and regulations.
- Some form of environmental indicators for mining should be developed to assist in the assessment of the state of the environment in mining areas.
- It should be mandatory for mining companies to obtain environmental certificates e.g. eco-rating.

Conclusion

It is difficult to measure the performance of foreign investors in India with respect to the environment. On the one hand it is claimed that companies are looking for “pollution havens”. On the other hand it is claimed that TNCs are the main agents of change in host economies, often bringing better technologies and products. The context study on India shows that both views may be valid, depending on the sector of operation.

Though the environmental legislation in India is of a long-standing nature, its implementation, particularly at the State level has proven to be difficult mainly due to the political situation in India over the past few years, which has not been conducive to good governance.

Studies have shown that the success of urging TNCs to adopt better environmental practices has depended more on community groups and grassroots NGOs, than on government action. Generalisations such as TNCs have adopted better technologies and environmental practices than local firms are difficult to ascertain empirically. More case studies are needed to ascertain TNC practices. It would also be necessary to evaluate TNC performances against specific environmental goals, such as the preservation of bio-diversity (Veena Jha, 2001).

In its rush to attract foreign investment, the Government may allow some environmental regulations to be violated. States competing for investment could induce a “race to the bottom”. It may be useful to explore whether special environmental safeguards are needed in the mining sector in order to promote sustainable development.

Another issue is controlling the behaviour of TNCs. In a multilateral investment agreement at the WTO or any other relevant world body, codes should be included to regulate and control the behaviour of the large companies, which are entering developing countries. This would prevent indiscriminate exploitation of the natural resources of developing countries by TNCs and prevent the phenomenon of lowering environmental standards by developing countries to attract FDI. Conditions could be imposed on TNCs entering the mining sector to make them abide by environmental laws & regulations and health & safety norms. Some kind of mechanism should also be available to punish the companies that break rules & regulations.

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