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# Overview of Mining and Mineral Industry in India

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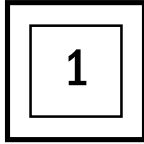
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## **Abbreviations**



# Introduction and objectives

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## 1.1 Introduction

This report has been prepared in response to the Terms of Reference (ToR) issued by the Director, Mining, Minerals and Sustainable Development (MMSD) project. The MMSD project 'is an independent process of participatory analysis with the objective of identifying how mining and minerals can best contribute to the global transition to sustainable development'. The project is managed through the International Institute for Environment and Development (IIED), London, and funded, predominantly, by the Global Mining Initiative (GMI), a grouping of the major global mining houses. In this context, the report seeks to provide an overview of the mining and minerals sector in India and the issues that have a bearing on the role of the sector in the society, economy and environment of the country.

## 1.2 Objectives

The focus of the country study is to prepare an overview of the mining (including processing of ore) and mineral industry and its impacts on sustainable development. The report would analyse the issues, which arise from people's expectations of the mining industry. In broader terms, the study would cover the following:

- Contribution of mining towards economic development both at national and regional level;
- Contribution of mining to social development at national and local levels;
- Environmental impact of mining which would cover, among others, land use, management of waste, loss of biological diversity, etc; and
- Conflicts and the mechanism available for resolution of disputes.

More specifically, the report covers the following:

- A general survey of the minerals sector in India
  - principal products
  - kinds of enterprises (multinationals, state companies, national private companies, artisanal mines)
  - employment in the sector and livelihoods

- value of production
- marketing of production (domestic, export, value added)
- importance in overall economy as measured by GDP, balance of payments, export earnings)
- other general data
- Case examples of campaigns against unjust mining by social action groups;
- Case examples of good practices being adopted by companies for environmental protection and community development;
- List of relevant institutions with contact information. These would be NGOs focussed on mining activities from development, environmental, human rights or other perspectives; government institutions and officials concerned with the industry; labour organisations and their leaders; major companies, industry associations, community leaders in communities impacted by mining, etc.
- Recommendations on (i) priority areas for future research; (ii) priority changes in policy necessary to increase the contributions of this sector to sustainable development.

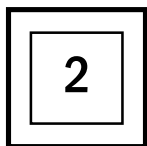
### 1.3 Methodology

- Due to the limited resources and time available for this study there was no opportunity to visit mining companies or to speak to a wide range of stakeholders. One visit was made to Nagpur for discussion with senior officers of a local coal company (WCL) and Indian Bureau of Mines. In addition, visits were made to concerned government departments, FIMI and other agencies.
- Detailed literature review was carried out. This material included publication of Indian Bureau of Mines, National Accounts Statistics and other relevant documents, DGMS reports, seminar / conference / workshop proceedings conducted during the last 5 years, NGO publications, etc.
- In addition, letters were addressed to mining companies and some NGOs for sharing information especially relating to environmental production, technology updation and social / community issues. There was response only from a few companies and one NGO. The report has been prepared based on the information / data collected and discussion with officials in different organization.

## 1.4 Report outline

Chapter 2 provides bulk of the information on the status of the mining and mineral industry in India. This covers exploration, production, processing, economic issues; policy and regulatory issues including institutional framework; small scale mining and environmental impacts and community issues.

Chapter 3 lists the priority areas for further research / study including policy reforms, which are needed in the sector.



## The Indian minerals sector

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### 2.0 The Indian mineral sector

#### 2.1 Introduction

India is a country of large dimensions. It spreads over a geographical area of 3.29 million square kilometres, which is about 2.5 per cent of the globe and makes the country the seventh largest in the world. Its population of over 1,000 million ranks it the second largest only next to China. India is Asia's third and world's eleventh largest economy.

The metallurgical and mineral industries constitute the bedrock of industrial development as they provide the basic raw materials for most of the industries. India produces as many as 84 minerals comprising 4 fuel, 11 metallic, 49 non-metallic industrial and 20 minor minerals. Their aggregate production in 1999-2000 was about 550 million tonnes, contributed by over 3,100 mines (reporting mines) producing coal, lignite, limestone, iron ore, bauxite, copper, lead, zinc etc. More than 80 per cent of the mineral production comes from open cast mines and therefore, one must add the quantity of overburden to that of the mineral production in order to assess the total amount of annual excavation in India's mining sector. The mining leases numbering 9,244 are spread over 21 States on about 13,000 mineral deposits occupying about 0.7 million hectares which is 0.21 per cent of the total land mass of the country. The aggregate value of the mineral production in 1999-2000 was more than Rs. 450 billion (approximately \$10 billion). The distribution of the value of mineral production shows that fuel minerals accounted for about 82% (of which solid fuels 44% and liquid /gaseous fuels is 38%), metallic minerals about 8%, non-metallic minerals 4% and the balance 6% is contributed by minor minerals.

The Mineral Policy opened the gates of Indian mineral industry to domestic and foreign investment, much of which was earlier reserved for the public sector. It aims to boost the country's exploration and mining efforts and render the mineral industry more competitive.

In October 1996, the ministry of steel and mines, Government of India, issued guidelines for grant of large areas for aerial prospecting under the provisions of the amended MM(R&D) Act. As a sequel to this directive, foreign investors evinced keen interest for investment in carrying out aerial prospecting

operations especially for base metals, diamond and gold in the states of Rajasthan, Maharashtra, Uttar Pradesh, Bihar & Gujarat. The total area covered for aerial prospecting in these states till March 1999 were about 71, 000 sq. kms. for minerals like copper, lead, zinc, gold, silver, diamond, cadmium, bismuth, nickel, cobalt and molybdenum. The statewise details are as follows: Rajasthan – 61938 sq. km., Maharashtra 3490 sq. kms., Uttar Pradesh – 2956 sq. kms., Bihar – 2472 sq. kms and Gujarat – 206 sq. kms.

## 2.2 History of India's mineral sector

The history of mineral development is as old as the civilization. In case of India, the mineral production dates back to the ancient times as the mining activities can be traced as far back as 6,000 years or so. The remains of some of the old mine workings are a witness to this fact. A few of these workings have led to the discovery of a number of significant mineral deposits, which are being worked in the present time. These include the lead-zinc deposit at Zawar, copper deposit at Khetri, and gold deposits in Karnataka. Techniques used specially in smelting were in fact ahead of the time in which they were applied. Rust-free iron pillar in New Delhi is considered to date back to the 4<sup>th</sup> Century.

In recent times the impetus to the mineral development was imparted in the country only after the political Independence came in the year 1947 when the significance of role of minerals was realized in nation building. On the eve of Independence, the annual value of mineral production was merely Rs. 0.58 billion and only a few minerals were mined and the country largely depended on imports of commodities such as copper, lead, zinc, sulphur, graphite, petroleum and their products. The inventory details were available only in respect of coal, iron ore, chromite, bauxite, manganese ore and magnesite.

Realising the significance of industrial development of the country, Industrial Policy Resolution was promulgated in 1956 by the Central Government. The exploration of minerals was intensified and the Geological Survey of India was strengthened for the purpose. The Indian Bureau of Mines (IBM) was established to look after the scientific development and conservation of mineral resources. IBM was also assigned the responsibility of conducting exploration with more of emphasis on coal, iron ore, limestone, dolomite, and manganese ore keeping in view the requirement of the proposed steel plants. Later, in 1972 when the Mineral Exploration Corporation was established, this function was transferred to it.

Under the Industrial Policy Resolution 1956, ambitious programme of developing several industries (such as steel, non-ferrous metals, cement, power,



fertilizers, etc.) were launched which required increasing quantities of minerals. Coal was the one to have received the maximum attention for being the basic fuel for a whole range of industries such as steel, railways and power plants.

Capacity for large-scale production of various minerals was created in the public sector, which is summarized as follows:

<b>Name of the company</b>	<b>Year of creation</b>
National Coal Development Corporation(NCDC)	1956
National Mineral Development Corporation (NMDC)	1958
Bharat Aluminium Company (BALCO)	1965
Pyrites, Phosphates and Chemicals Ltd. (PPCL)	1960
Hindustan Zinc Ltd.(HZL)	1966
Neyveli Lignite Corporation Ltd. (NLC)	1957
Hindustan Copper Ltd.(HCL)	1967
Bharat Gold Mines Ltd.(BGML)	1972
Steel Authority of India (SAIL), formerly Hindustan Steel Ltd	1973

The entire production of lignite, petroleum and natural gas, copper, lead- zinc ores, gold, silver, diamond, tungsten concentrates, pyrites, rock phosphate, etc. was contributed from the mines operated under the public sector.

In the infancy of mineral consuming industry, no significance was assigned to beneficiation of minerals, therefore, only high-grade minerals were mined. With the concept of conservation of minerals assuming an important role, mineral processing plants were set up. National Metallurgical laboratory was established in 1950.for undertaking beneficiation tests. During the same year, the Metal Corporation of India set up the first beneficiation plant in the country to process its lead-zinc ore. A number of coal washeries were set up in the 1950s to beneficiate coking coal required for the steel plants. As the significance of mineral processing was realised, Indian Bureau of Mines (IBM) set up a pilot plant of 250 kg/hour capacity which played an important role in designing commercial beneficiation plants in the country. In order to meet the growing requirement in mineral beneficiation, IBM set up two processing laboratories at Ajmer and Bangalore followed by a modern plant at Nagpur. A number of beneficiation plants were set up in the mines producing copper ore, lead-zinc ore, manganese ore and iron ore.

## 2.3 Current status of mining industry in India

### 2.3.1 Mineral resources

The country is having a well-developed mining sector, which has vast geological potential with over 20,000 known mineral deposits. Up to the Seventh Plan period (1990), significant progress was made in the development of mineral resources in the country which is amply depicted in the appreciation of mineral inventory. This helped the country to enter the realm of plenty in respect of certain minerals in which it was hitherto deficient. The discovery of huge bauxite deposits, particularly in the East Coast, is a case in point, which took the country from the phase of a nonentity to one having the fifth largest inventory of bauxite in the world. In the Eighth Plan, greater emphasis was laid on mineral exploration by adoption of improved technologies like remote sensing, geotechniques, etc., particularly for those minerals in which the resource base of the country is poor such as gold, diamond, nickel, tungsten, rock phosphate, sulphur, etc.

The Geological Survey of India, State Directorates of Mining and Geology, Public Sector Units like NMDC, MEC, HCL, CMPDI, HZL, BGML etc are the agencies for surveying, mapping and exploration of new deposits and reassessment of older deposits / mines. Out of the total area of 3.29 million sq. kms. of the country, systematic geological mapping of 3.15 million sq. kms. have been carried out by GSI. As a result of the cumulative efforts of the various agencies involved, considerable inventory has been added to most of the mineral deposits in the country. The recoverable reserves status of some important minerals are given in Table 1.

**Table 1** Recoverable reserves of mineral/ore in India (1970 & 1995)

Mineral/Ore	Recoverable reserves ( million tonnes )	
	1970	1995
Iron Ore (hematite)	8244	10,052
Iron Ore (magnetite)	2025	3,408
Manganese Ore	108	167
Bauxite	233	2,462
Copper Ore	244	461
Lead & Zinc Ore	107	176
Dolomite	1152	4,386
Limestone	73199	75,678
Chromite	9	86
Coal <sup>1</sup>	94000	210000

Note: <sup>1</sup>For coal it is total geological reserve

Today, the reserves details are available for as many as 20,000 mineral deposits all over the country. The Indian Bureau of Mines has prepared inventory of mineral deposits for the country and updates it every five years. The country is self sufficient in case of 36 minerals and, deficient in respect of a number of minerals. The position is summarized as follows (Table 2).

**Table 2** Mineral reserves in India

Grouping	Abundant	Adequate	Deficient	Scarce
Fuel Minerals	Noncoking coal	Lignite	Coking coal	Petroleum crude
Metallic minerals (ferrous)	Iron ore	Chromite (metallic), Manganese	Chromite (refractory grade)	Nickel, Tungsten, Cobalt, Molybdenm, Vanadium
Metallic minerals (Non-ferrous)	Bauxite (metallurgical grade)	Zinc	Bauxite(chem), Copper, Lead	Antimony, Gold, Platinum group of minerals , Tin
Industrial minerals	Dolomite, Gypsum, Limestone, Mica,	Graphite	Apatite, Rockphosphate, Kyanite	Sulphur, Potash
Precious stones	--	--	--	Diamond, Emerald, Sapphire, Ruby

The search for minerals did not remain confined to landmass only. It was extended to off shore area and even deep ocean. Result was the discovery of large petroleum deposits in the Arabian Sea which came to be known as Bombay High. The exploration work in the deep ocean led to the discovery of polymetallic nodules bearing cobalt, nickel, copper and manganese at a depth of 3,000 metres. This work earned India the status of Pioneer Investor in seabed mining conferred by the United Nations.

## Mineral production

*Mining leases.* The total number of mining leases granted in the country for different minerals as on March 1998 were 9244 covering an area of about 0.7 million hectares and spread over 255 districts in 21 states. The following ten states together account for 93% of the total leases granted: Gujarat (15%), Rajasthan (14.5%), Andhra Pradesh (14%), Madhya Pradesh (13.5%), Karnataka (11%), Tamil Nadu (7%), Orissa (6.5%), Bihar (4.7%), Goa (4.3%) and Maharashtra (2.4%). Out of 9244 mining leases, 639 (7%) leases were in the public sector covering an area of 0.47 Mha and the balance in the private sector. In all 3100 mines located in 19 states / union territories were reported to have worked during 1999-2000 of which 566 mines belong to fuel minerals, 561 to metallic minerals and 1973 to non-metallic minerals. This may not include all

the mines working minor minerals in different states. There were 828 mines in public sector and the rest in private sector. About 80% of the reporting mines were concentrated in seven states namely, Madhya Pradesh, Rajasthan, Gujarat, Andhra Pradesh, Bihar, Orissa and Karnataka. The Public Sector contributes 100% of copper, diamond, lead, silver and zinc and lignite; 98% of coal, 60% of iron ore and 50% of manganese, bauxite, chromite and dolomite in the total mineral production.

The value of mineral production during 1999-2000 was estimated at Rs.452.3 billion of which the contribution from public sector was Rs.378.4 billion (84%). In the total value of mineral production, fuel minerals accounted for Rs.372.3 billion (82%), metallic minerals at Rs.34.2 billion (8%) non-metallic minerals Rs.18.3 billion (4%) and minor minerals Rs.27.6 billion (6%). The mineral production in 1970-71, 1990-91 and 1999-2000 are given in Table 3.

**Table 3** Production of some selected minerals in India (by mineral groups)

Mineral	Unit	1970-71	1990-91	1999-2000
<i>Fuel minerals</i>				
Coal	Million tonnes	73.7	211.3	300.0
Lignite	Million tonnes	3.5	14.0	21.9
Crude oil	Million tonnes		33.0	32.0
Natural gas	BCM		18.0	26.4
<i>Metallic minerals</i>				
Bauxite	Million tonnes	1.4	5.0	6.8
Chromite	Million tonnes	0.3	0.9	1.7
Copper ore	Million tonnes	0.5	5.3	3.1
Iron ore	Million tonnes	31.4	55.5	73.5
Manganese ore	Million tonnes	1.7	1.5	1.6
Lead & zinc ore	Million tonnes		NA	2.7
Gold ore	Million tonnes		NA	0.7
<i>Non metallic minerals</i>				
Limestone	Million tonnes	23.8	70.1	127.9
Dolomite	Million tonnes	1.1	2.6	2.9
Gypsum	Million tonnes	NA	1.7	3.3
Diamond	(000 Carats)	20	18	41

As can be seen from the table, there has been a rapid growth in the production of coal and lignite, iron ore and limestone in the past three decades. A list of major mining and mineral companies in the public and private sector is given in Annexure 1. A list of mining and industry associations is given in Annexure 2.

## Mineral processing and mineral based industry

The National Mineral Policy, 1993 facilitated the growth of mineral based industries through investment in the private sector. As per the policy, processing units which desire to develop captive mines to secure assured supplies of raw material are allowed foreign equity participation in the manner and to the extent applicable to such processing units. The major mineral based products are pig iron, sponge iron, crude steel, ferro – alloys (ferro-chrome, ferro- manganese, ferro – silicon, charge-chrome), non ferrous metals (aluminium, copper, lead , zinc), dry cell batteries, cement, asbestos cement, ceramics, glass and glasswares, fertilisers and chemicals.

There has been a significant increase in the mineral processing activity in respect of various minerals. This is indicated by ‘Production –Processing Index’ which denotes the percentage of domestic mine production processed within the country and is given in Table 4.

**Table 4** Extent of mineral processing of domestic mine production of principal minerals in 1998-99

Mineral	Quantity produced in terms of metallic compound contained (million tonnes)	Processing stage	Quantity processed (million tonnes)	Production – Processing Index (%)
<i>Metallic minerals</i>				
Bauxite	2.96	Alumina, refractory, abrasive, chemical	1.59	53.7
Chromite	0.51	Chromite	0.30	58.8
Iron ore	45.3	Pig iron including sponge iron, steel	19.6	43.3
Manganese ore	0.56	Ferro manganese, iron & steel, battery, EMD, chemical	0.36	64.3
Zinc (conc.)	0.19	Refined metal	0.19	100
<i>Non – metallic minerals</i>				
Barytes	0.66	Oil wells drilling chemicals, paints	0.1	15.6
Dolomite	2.92	Iron & steel, refractory and others	2.92	100
Gypsum	3.93	Cement & others	3.79	96.3
Limestone	113.6	Cement, iron & steel, others and chemicals	99.3	87.5
Magnesite	0.35	Refractories, Dead burnt magnesite	0.27	76.7
Rock phosphate	0.40	Phosphatic fertilisers & chemicals	0.39	99.5

## Scenario by principal minerals

### *Bauxite*

The huge bauxite resources place India fifth amongst bauxite producing countries in the world. The total recoverable resources in the country as on 1.4.1995 are 2,462 million tonnes of which 768.2 million tonnes are under proved, 586.4 million tonnes under probable and 1,107.8 million tonnes under possible category. These deposits spread over a number of States notably Orissa, Andhra Pradesh, Madhya Pradesh, Gujarat, Maharashtra and Bihar. At 86 per cent of the total, the Indian bauxite deposits are predominantly of metallurgical grade. Compared to this, refractory grade at one per cent and chemical grade at 0.36 per cent make the country seriously deficient in these grades.

During the year 1999-2000, the production of bauxite was 6.85 million tonnes. The production had gradually picked up after the discovery of East Coast bauxite. It was 4.8 million tonnes in the beginning of the 90s and increased to 6.8 million tonnes mark in the year 1999-2000. The production of came from 166 mines. As much as 81 per cent production was contributed by 30 mines belonging to 9 principal producers which include NALCO, INDALCO, HINDALCO, BALCO, MALCO, Swati Minerals, Saurashtra Calcine Bauxite & Allied Industries, Saurashtra Cements and MP State Mining Corporation. Daily employment in mines is about 7,000 workers.

Amongst the States, Orissa is the leading producing State at 42 per cent. Bihar at 18 per cent, Gujarat at 14 per cent, Maharashtra at 13 per cent and Madhya Pradesh at 10 per cent are other significant contributors to production efforts.

The total bauxite consumption in the country was 5.4 million tonnes during the year 1998-99. Of this, about 60 per cent are consumed by metallurgical industry in producing alumina and aluminium and rest is shared by cement, refractory, chemical and abrasive industries. Aluminium industry uses bauxite bearing 58 per cent  $Al_2O_3$ . Slightly lower grades are also used for the purpose after blending. About one lakh tonnes of bauxite is exported to countries such as China, Korea, Ukraine and Saudi Arabia.

About 610,000 t of aluminium metal is produced in smelters of HINDALCO (Renukoot), NALCO (Angul), BALCO (Korba), INDALCO ( HIRAKUD, Alupuram, Belgaum) and MALCO (Mettur). The country produces alumina for aluminium production and also for exports. Presently the production is around 1.97 million tonnes from the plants of the above companies.

### *Chromite*

As on 1.4.1995, the chromite recoverable resources of the country were 86.23 million tonnes of which 28.68 per cent were under proved category, 35.70 per cent under probable and 34.47 per cent were under possible category. As much as 97 per cent deposits are located in Orissa. About 34 per cent of the reserves are of metallurgical grade and 29 per cent are charge chrome grade.

During the year 1999-2000, the chromite production was 1.69 million tonnes which came from 20 mines. Tata Iron and Steel Company, Orissa Mining Corporation, Ferro Alloys Corporation and Indian Metal and Ferro Alloy are the four companies, which contribute 93 per cent production from 11 mines. The production comes mostly from open cast mines. However, there are underground mines in Byrapur, Karnataka and Boula and Kathpal, Orissa. Orissa contributes as much as 99 per cent production. The employment in chromite mines is around 7,000.

The chromite ore is consumed in manufacturing ferro alloys including charge chrome, chemicals and refractories.

### *Copper ore*

Recoverable resources of copper ore were 461 million tonnes as on 1.4.1995. These reserves contain 4.7 million tonnes of copper metal at 1.02 per cent of metal content in the ore. About 40 per cent of the reserves are under proved category. Probable category has 35 per cent and the share of possible category is 25 per cent. Major deposits are located in Madhya Pradesh, Rajasthan and Bihar.

The country produced 3.12 million tonnes of copper ore in 1999-2000 containing 35,000 t of copper metal. from mines located in Bihar, Rajasthan, Madhya Pradesh and Sikkim. This production was contributed by 10 mines belonging to Hindustan Copper Ltd and Sikkim Mining Corporation. Mines such as Khetri and Kolihan are highly mechanised underground mines. Chandmari and Malanjkhanda are open pits. The later is the largest hardrock open cast mine in the country producing 2 million tonnes of ROM per annum. The total annual excavation is around 10 million tonnes. Malanjkhanda also has a matching concentrator plant. The total employment in copper mines is around 6,000.

There are two smelters in the public sector located at Khetri and Ghatsila with installed annual capacity of 31,000 and 16,500 t respectively. These smelters also produce by-products such as gold, silver, selenium, tellurium, nickel sulphate, phosphoric and sulphuric acids. Expansion programme of these smelters to 100,000 t and 25,000 t is under consideration. Two smelters in the

private sector have already been commissioned. These belong to Starlit Copper Company (100,000 tpy at Tuticorin) and another owned by Birla Copper (100,000 tpy at Dahej in Gujarat). A smelter by SWIL Ltd based on 50,000 t scrap annually in Bharuch district, Gujarat) and Metadist (150,000 tpy in Amroli district, Gujarat) are under installation at present.

### *Diamond*

Reserves of diamond are found in Madhya Pradesh, Andhra Pradesh and also in Orissa. The recoverable reserves, as on 1.4.1995 were 982,000 carats.

Production of diamond during the year 1999-2000 was about 41,000 carats, which was contributed by two mines located in Panna, Madhya Pradesh. The mine owned by National Mineral Development Corporation at Majhgawan accounted for as much as 99 per cent production. Merely one per cent production came from Directorate of Geology and Mining, Madhya Pradesh. The diamonds produced were of gem variety (29 per cent), off colour (36 per cent) and industrial (35 per cent) variety.

The capacity of NMDC mine is to be expanded to 84,000 carats per year. India is one of the largest exporters of cut and polished diamonds in the world. During the year 1998-99 the exports were Rs 19,977 crone of which 37 per cent were imported by the USA. The indigenous production is not adequate for the purpose and therefore, large quantities of rough diamonds are imported by the country. The diamond imports were as much as Rs 15,555 crone during the year 1998-99.

### *Granite*

Granite has been a non-entity till '80s when it discovered for itself a fabulous export market particularly due to the spurt in construction activities in the Middle East. This transformed it into a precious foreign exchange earner. The country has abundant resources of granite and keeping in view the potential for export of granite, an assessment of the available reserves in the country was carried out by several agencies. On account of the efforts made by GSI, IBM and the Directorates of Geology and Mining of different States, it is estimated that the country has as much as 1,027 mil cu m of granite reserves consisting of 160 varieties of different colour and texture. Granite reserves are found in Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Orissa, Rajasthan, Tamil Nadu, and Uttar Pradesh, etc.

During the year 1997-98, the production of granite was 1.19 mil cu m of which 30 per cent was contributed by Tamil Nadu, 27 per cent by Karnataka, 24



per cent by Andhra Pradesh, 9 per cent by Uttar Pradesh and 4 per cent by Rajasthan. Granite mining is carried out through open cast operations of quarrying, block splitting and processing by manual, semi mechanised and mechanised means such as flame jet cutters. The exports of granite was 0.8 million tonnes in 1998-99 of all categories and were valued at Rs 1.0 billion. The exports were mainly destined to USA, China, UAE, Germany and Belgium.

Granite comes under the category of 'Minor Minerals' and is therefore administered by the respective State Government. Looking at the significance of granite as foreign exchange earner, there was an opinion that it should be made a major mineral so that there is a uniform policy through out the country in respect of its exploitation. A significant step has been taken in this direction by the Government of India in June 1999 when it promulgated 'Granite Conservation and Development Rules, 1999' in the interest of having a uniform policy for granite development, exploitation and conservation.

#### *Iron ore*

India possesses large resources of good quality iron ore located in a number of States such as Andhra Pradesh, Bihar, Goa, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, etc. The reserves are adequate to meet the growing requirement for indigenous consumption and for exports. As on 1.4.1995, recoverable reserves measure up to 13 billion tonnes (hematite 10 billion tonnes and magnetite 3 billion tonnes) which makes India the sixth richest country in iron ore resources in the world. The reserves are somewhat limited in high grade ore as 8.86 bil t of hematite deposits are of medium quality. Blending of medium grade with high grade for indigenous consumption and for exports has been resorted to meet the quality requirement. Thus the scenario appears to be quite comfortable. Use of iron ore fines has also helped to further improve the situation.

India produced about 73.5 million tonnes of iron ore in 1999-2000 from both public sector and private sector mines. Out of 213 mines (1999-2000), 34 are owned by public sector undertakings, which produce 55 per cent of the total production. Of this, 11 mines have the capacity to produce more than one million tonnes per annum and contribute about 48 per cent of the total output. Private sector also has large mines of which six have annual production capacity exceeding one million tonnes. These six mines contribute about 16 per cent to the national production. As much as, 25 per cent production comes from Madhya Pradesh followed by Karnataka (21%) and Goa (21%). Approximately, 34,000 persons are employed in Indian iron ore mines. About 47 per cent of the

total production, is domestically consumed in iron and steel, sponge iron, ferro alloys, and alloy steel industries. During the year 1999-2000 29.5 million tonnes of iron ore were exported and 50% of the exports are to Japan and 22 per cent to China.

#### *Lead and zinc ore*

The recoverable resources bearing the twin minerals in the country were 176 million tonnes as on 1.4.1995. These reserves contain 2.2 million tonnes of lead metal and 9.81 million tonnes of zinc metal. The reserves under proved category are 39 per cent whereas probable category has 27 per cent and possible has 34 per cent. As much as 87 per cent reserves are located in the State of Rajasthan with much smaller quantities in Andhra Pradesh, Bihar, Gujarat, Maharashtra, Sikkim, Tamil Nadu and Uttar Pradesh.

The total production in the year 1999-2000 was 2.74 million tonnes with overall 10.70 per cent total metal content comprising 2.06 per cent lead and 8.64 per cent zinc. The entire quantity is produced in the public sector by Hindustan Zinc Ltd. HZL consumes this ore in its smelters having capacity of 1,52,000 zinc metal and 65,000 lead metal. Cadmium, silver, sulphuric acid and phosphoric acid are obtained as by-products in these smelters. Binani in the private sector operates a smelter of 30,000 t capacity based on imported concentrates. Two small lead-smelting plants have been set up in West Bengal and Maharashtra with a total capacity of 24,000 t per annum.

The mines at Zawar, Rajpura-Dariba and Rampura-Agucha are highly mechanised. The first two are underground mines. Rampura-Agucha is an open cast mine of 3000 tad production capacity which is being raised to 4,500 tad. The mine was commissioned in May 1991 together with a smelter at Chandeliya which proved to be a significant step in reducing dependence on imports in the case of both the metals. There are small lead mines at Sargipalli and Agnigundala. Total employment in the mines is approximately 5,000. Small quantity of polymetallic ore bearing copper, lead and zinc is also produced in Sikkim at the rate of 100 tad.

#### *Limestone*

Limestone deposits are found all over the country. The total recoverable deposit is a fabulous 75,678 million tonnes. Of this, 16 per cent deposits are under proved category and 23 per cent probable and 61 per cent are under possible categories. Cement grade accounts for 68.8 per cent, 6.5 per cent SMS, 7 per cent BF and 3.75 per cent are Chemical grades.

For the last several years, the production of limestone is more than 100 million tonnes. During the year, 1999-2000 it was 129 million tonnes from 510 opencast mines. Five mines have production capacity exceeding three million tonnes and contribute 14 per cent to the production. There are 13 mines, which produce between two to three million tonnes with the contribution of 24 per cent of the total production. Mines numbering 29 have capacity between 1 to 2 million tonnes and contribute 31 per cent. Thus 69 per cent production comes from mines having production capacity exceeding one million per annum. Large mines are mechanised and are captive to industries such as steel and cement making. Public sector has a share of only 6 per cent.

Limestone is consumed by a large number of industries such as cement, chemical, fertilizers, aluminium, steel, ferro alloys, foundry, glass, paper, sugar, etc. Maximum limestone is consumed by cement industry. During the year 1998-99 as much as 89 per cent limestone was required by cement plants. Depending upon the use to which it is put on account of its specifications, limestone is defined both as a major as well as a minor mineral.

#### *Manganese ore*

As on 1.4.1995, the recoverable reserves of manganese ore were 167 million tonnes of which 24 per cent were under proved category, 29 per cent probable and 47 per cent under possible category. Battery grade accounted for 2.40 million tonnes, ferromanganese 33 million tonnes, medium grade 38.63 million tonnes and BF grade 65.5 million tonnes. As much as 31.6 per cent of the recoverable deposits are located in Orissa, 24.53 per cent in Karnataka, 14.13 per cent in Madhya Pradesh and 10 per cent in Goa. Other States having deposits of manganese ore include Maharashtra, Andhra Pradesh, Bihar, Gujarat and West Bengal.

During the year 1999-2000, 1.57 million tonnes manganese ore was produced in the country, which came from 135 mines, both opencast and underground owned by 78 producers. More than half the production comes from nine mines only each having a production capacity exceeding 50,000 t per annum. Mines belonging to public sector numbering 23 contribute more than 58 per cent of production. The contribution by Orissa is maximum at 32 per cent, followed by 23 per cent from Maharashtra, 21 per cent from Madhya Pradesh and 18 per cent from Karnataka. The employment in mines is approximately 15,000.

Indigenously, manganese ore is consumed in a number of industries such as alloy steel, battery, chemicals, ferro alloys, iron and steel, zinc smelter and

ceramic glass. The consumption is around one million tonnes per annum. About 10 per cent of the production is exported.

## Institutions

There are many institutions which oversee the development of the mining and mineral sector in India. At the Central Government level, there are ministries of Coal & Mines; Steel; Industry; Chemicals & Fertilisers; Atomic Energy, Petroleum & Natural Gas, Environment and Forests and Labour. The Ministry of Mines in the Central Government has the overall responsibility of determining policies and strategies in respect of non-ferrous (aluminium, copper, zinc, gold, nickel etc.) metals. The Ministry of Mines (MoM) is responsible for survey and exploration of all minerals, other than natural gas, petroleum and atomic minerals. The MMR&D Act is administered by the MoM. There are two subordinate offices, 7 public sector companies and three research institutions under the MoM. The Ministry of Coal has the overall responsibility for the development of coal and lignite resources.

### Sub-ordinate offices under MoM:

- Geological Survey of India (GSI): The GSI is the principal agency responsible for the assessment of geological and regional mineral resources of the country. Its areas of operation encompass scientific surveys and research, for locating mineral resources. GSI operates through six regional offices and four specialised wings – marine, coal geophysics, airborne surveys and training. The GSI has to its credit geological mapping, covering an area of approximately 3.146; million sq. km, or 94 percent of the area of India. The maps are on a 1:63,360/ 1:50,000 scale, the data having been synthesised to produce 1:2,000,000 scale geological maps of India, which have been correlated with the global set up as per international standards. The GSI is also actively involved in the research and development of mapping and exploration techniques. It has set up a chain of modern petrological paleontological, chemical, mineralogical, geochronological, geotechnical and geophysical laboratories in its different operational bases, and offers its facilities and services on payment. Geological maps and data are available with GSI on a commercial basis.
- Indian Bureau of Mines (IBM): IBM is the principal government agency responsible for compiling exploration data and mineral maps and for providing access to the latest information in respect of mineral resources in the country. IBM has both regulatory as well as service functions. IBM offers

technical expertise and proven experience in the fields of geology, mine planning and feasibility studies. The geological services of IBM include survey and preparation of mine plans, preparation of geological plans, preliminary geological appraisal of mineral properties, including the formulation of an initial scheme of detailed exploration with estimate of cost and preliminary reconnaissance, quick survey to determine potential areas out of large properties, etc. IBM also performs regulatory functions, namely: enforcement of Mines and Minerals (Regulation and Development) Act, Mineral concession Rules, Mineral Conservation and Development Rules and compliance with Environmental Protection Act. IBM disseminates statistical information on mines, minerals, metals and mineral based industries through its various publications which are available for sale on commercial basis.

#### Public Sector Undertaking (PSUs)

- Mineral Exploration Corporation Ltd. (MECL): MECL is responsible for detailed exploration of various minerals/ ores by drilling and exploratory mining and proving reserves for their eventual exploitation.
- National aluminium Company Limited (NALCO), Bhubaneswar
- Bharat Aluminium Company Limited (BALCO), New Delhi;
- Hindustan Zinc Limited (HZL), Udaipur;
- Hindustan Copper Limited (HCL), Kolkata;
- Mineral Exploration Corporation Limited (MECL), Nagpur;
- Bharat Gold Mines Limited (BGML), Kolar Gold Fields (Karnataka);
- Sikkim Mining Corporation (a Company jointly owned by the State Government of Sikkim and the Central Government)
- Research Institutions

## 2.4 Economic issues

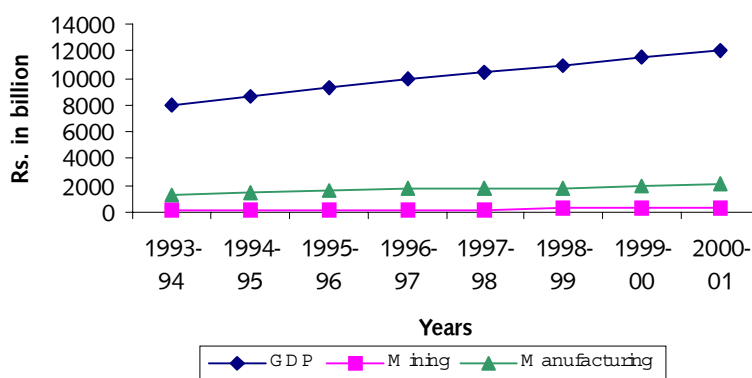
### Contribution of mining and quarrying to Gross Domestic Product (GDP)

India's gross domestic product (GDP) at factor cost at constant (1993-94) prices in 2000-01 was estimated at Rs.12117 billion as against Rs.7991 billion in 1993-94. The CAGR for the period 1993-94 to 2000-01 works out to be 5.3 percent. The contribution of mining and quarrying sector in GDP at constant (1993-94) prices in 2000-01 was Rs.274 billion as against Rs.197.0 billion in 1993-94. This works out to a CAGR of 4.2% for the period 1993-94 to 2000-01. The share of

mining and quarrying in GDP has marginally declined from 2.47% in 1993-94 to 2.26% in 2000-01. The details are given in Figure 1 and Table 5.

**Table 5** Trends in GDP at factor cost and manufacturing and mining sectors in India (1993-94 prices)

Year	GDP	Mining	Manufacturing (Rs. Billion)	Share of mining in GDP (%)
1993-94	7990	197	1266	2.47
1994-95	8610	215	1400	2.50
1995-96	9264	231	1611	2.49
1996-97	9990	233	1734	2.34
1997-98	10491	240	1851	2.29
1998-99	10830	260	1842	2.40
1999-00	11520	264	1967	2.30
2000-01	12117	274	2077	2.26



**Figure 1** Trends in GDP at factor cost and manufacturing and mining sector in India (1993-94 prices)

Source. National Accounts Statistics, 1996 & 1999: CSO

### *Index of mineral production*

The index of total mineral production in 1999-2000 was 126.8 (1993-94 = 100) and the CAGR from 1993-94 to 1999-2000 works out to be 4%. The index of mineral production from 1995-96 to 1999-2000 for various minerals are given in Annexure 3.

## Share of mining and mineral industry in merchandise exports and imports

### *Exports*

Minerals in both raw and processed forms contribute significantly to India's exports trade. The value of exports of ores and minerals during 1998-99 was Rs.246 billion as against Rs.66.6 billion in 1990-91. The share of mineral exports to the total merchandise exports from the country in 1998-99 was 17.6%.

Diamond (mostly cut) continued to be the largest constituent in the exports with a share of 81% of the mineral exports. This is followed by iron ore (6.6%), granite (4.1%) and precious and semi-precious stones (2.8%). The individual share of other ores and minerals was less than 1%.

The CAGR of mineral exports for the period 1990-91 to 1998-99 works out to be 17.7%. Export of diamond (cut) was Rs.47.1 billion in 1990-91 which increased to about Rs.200.0 billion in 1998-99. Similarly imports of raw diamond which was Rs.36 billion in 1990-91 increased to Rs.155 billion in 1998-99. If diamond is excluded from total mineral exports, exports of other minerals and ore account for only about 3.1% of the country's total merchandise exports. Therefore it has no significant impact on total exports. Since the country produces very little raw diamond, most of it is imported and is cut and polished and exported. This industry, which adds about Rs.45 billion in value to the raw diamond, employs a large workforce.

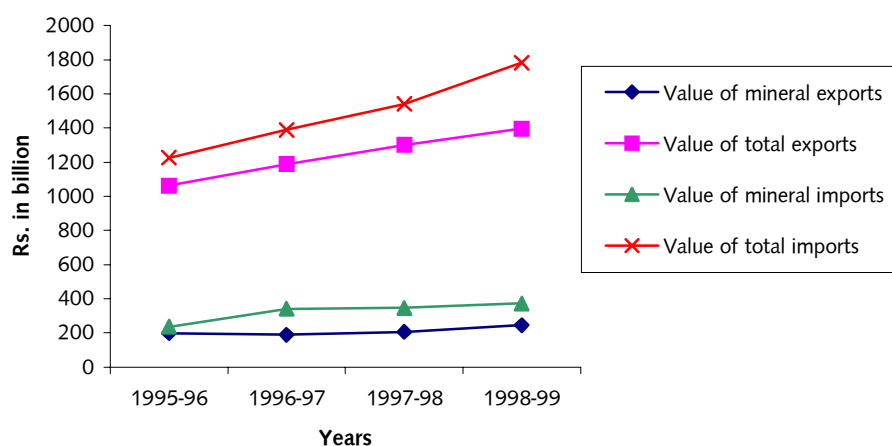
### *Imports*

The value of imports of ores and minerals during 1998-99 was Rs.373.5 billion as against Rs.115.8 in 1990-91. In 1998-99 imports of ores and minerals accounted for 21% of all merchandise imported in India. In this case also, diamond (uncut) emerged as the largest constituent with a share of 42% of mineral imports, followed by crude oil 40%, coal (9.5%) and rock – phosphates – 2.2% and copper ores and concentrates (1.5%) and coke (1.5%). The details of exports and imports are given in Figure 2 and Table 6.

**Table 6** Value of exports and imports (Rs. Billion)

Year	Total exports	Mineral exports	Share (%)	Total imports	Mineral imports	Share (%)
1990-91	325.5	66.6	20.5	432.0	115.8	26.8
1995-96	1063.5	198.2	18.6	1226.8	236.6	19.3
1996-97	1188.2	189.6	16.0	1389.2	342.9	24.7
1997-98	1301.0	206.4	15.9	1541.8	346.5	22.5
1998-99	1397.5	246.2	17.6	1783.3	373.5	20.9

**Source.** 1. Mineral exports and imports (Mineral Year Book: IBM of different years)  
2. Total exports, imports based on DGCI & S statistics



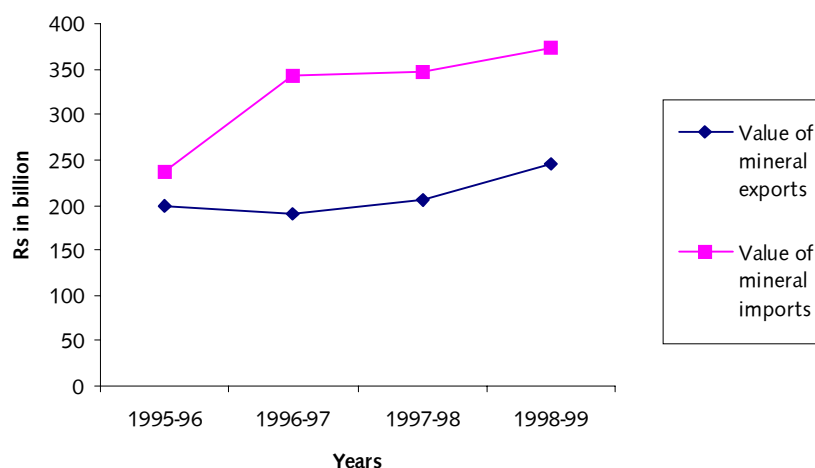
**Figure 2** A comparison of the trends in mineral exports and imports with total exports and imports from India for the years between 1995-96 and 1998-99 (Rs. Billion)

Mineral as a group continued to face adverse balance of trade during 1998-99 with the total value of ores and mineral exports at Rs.246 billion as against the total value of imports of ore and minerals at Rs.373 billion during the same year while the total value of exports of metals and alloys was Rs.40 billion in 1998-99 as against value of imports of metals and alloys at Rs.31 billion in the same period. The trends in mineral exports and imports for the period 1995-96 to 1998-99 are given in Figure 3 and Table 7.

**Table 7** Trends in mineral exports and imports for the years between 1995-96 and 1997-98 (Rs. Billion)

Year	Value of mineral exports	Value of mineral imports
1995-96	198	236
1996-97	190	342
1997-98	206	346
1998-99	246	373





**Figure 3** Trends in mineral exports and imports for the years between 1995-96 and 1997-98 (Rs. Billion)

### Commodity wise exports in 1998-99

The value added semi processed/processed minerals figuring in India's foreign trade include cut and polished diamonds/emerald, etc., pulverized barytes, steatite and wollastonite, washed/processed kaolin, beneficiated graphite, calcined magnesite; processed mica and manufactured mica products, dimension stones; refined borax; alumina etc. The manufactured mineral based commodities include metals and alloys and products thereof, cement, fire bricks and other refractory materials, clay-bonded graphite crucibles/nozzles and silicon carbide crucibles, asbestos-cement products, inorganic chemicals like lime and fluorine chemicals, refined borax and borates, elemental phosphorus and phosphoric acid, titanium dioxide, petroleum products etc. The details are given Table 8.

**Table 8** Contribution of value-added (processed) minerals and mineral-based products to India export trade in 1998-99

Commodity Group	Value of export (Rs. Billion)	Contribution (Percentage)
All Merchandise*	1393	100
Minerals	246	17.67
Raw/unprocessed form	22	1.60
Semi-processed/ processed forms (Preliminary and intermediate stage of processing)	224	16.06
Manufactured Mineral-based commodities (final stage of transformation)	51	3.67
Metals / Alloys	40	2.86

Others	11	0.81
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\*Excluding re-exports

## Government revenues

The mining and mineral industry contributes to the Central and State Government revenues through payments of royalty, dead rent, cess, sales tax, excise duties and custom duties.

### *Royalty and dead rent*

As per Section 9 of the Mines and Minerals (Development and Regulation) Act, the holder of a mining lease is required to pay royalty to the State Government in respect of any mineral removed or consumed at the rate specified in the Second Schedule of the Act.

The Central Government by a notification in the official gazette may amend the royalty rates specified in the Second Schedule of the Act once in 3 years. An expert group appointed for the purpose recommends the rates to the Central Government. The royalty rates of all minerals (excluding coal and lignite) were revised in October 2000. A list of the notification is given in Annexure 4. It is observed that for 30 minerals, the royalty is based on sale price on ad-valorem basis and for metals like copper, lead, tin, zinc it is based on the London Metal exchange prices. For gold it is based on London Bullion Market Association price. For 18 minerals including coal and lignite, it is a fixed amount per tonne of despatch.

As per Section 9A of the Act, the holder of a mining lease is required to pay dead rent to the respective State Government at rates specified in the Third Schedule of the Act for the area under the mining lease. In case the holder of the mining lease is liable to pay royalty, he shall pay either royalty or dead rent whichever is more. The dead rent may also be amended by the Central Government once in a any period of three years. The details are given in Annexure 4.

Royalty is imposed on the mining industry to generate revenue for the State Governments. The funds collected through royalty or dead rent go to the general pool of the respective government. Thus the mining industry does not get any advantage out of it. There is a general feeling that a part of this fund should be transferred to the local authorities for the development of the mining areas which are generally located in remote, forest or tribal areas and are in need of funds for development.

A policy decision has been recently taken by the State Government of Maharashtra with regard to allocating a part of the royalty collected on mineral production in the State which will be spent on development of mineral producing areas. A Mineral Development Fund has been set up the State Government to which 10 per cent of the royalty collected is transferred. During the last two years as much as Rs 63 crore were thus made available to the Fund as the royalty collection was Rs 270 and Rs 360 crore. This Fund shall be spent on the development of the infrastructure in the districts having mining activities and also in the development of mines in the ratio of 2:1 respectively.

### *Payment of royalty*

The amount of royalty paid by the coal sector to the various states in 1999-2000 was about Rs.21.1 billion as against Rs. 8.4 billion in 1991-92. The massive increase in royalty payments has been due to a sharp increase in royalty rates in 1994 and also due to increase in production/despatch. The rate of royalty on coal varies from Rs.50 to Rs.175 per tonne depending on the type and grade of coal. The rate of royalty on lignite has been increased from Rs.2 to Rs.50/- per tonne with effect from March 2001 (Table 9).

**Table 9** Royalty payment to different states by coal mines (Rs. Million)

State	1991-92	1999-2000
West Bengal	100.7	100.8
Bihar	3343.5	5881.7
Orissa	434.7	2531.7
Maharashtra	638.9	2207.9
Madhya Pradesh	2400.0	6743.4
Uttar Pradesh	474.9	1314.8
Assam	6.4	69.6
Andhra Pradesh	1009.7	2273.4
Total	8408.8	21123.3

### *Excise duty*

In addition to royalty, excise duty (@Rs.3.5 – Rs.4.25 / tonne) on coal production is levied by the Central Government. The purpose of this excise duty is for carrying out protective works and developmental activities in the coal mines. The excise duty on mineral based manufactured products is levied and collected by the Central Government.

### *Cess*

Cess is collected on some minerals (mica, limestone and dolomite, iron-ore and chromite) to set up welfare funds to provide housing, medical care, social security, education and recreation facilities for workers employed in these mines. Cess is collected by the Central Government and the Ministry of Labour is responsible for the administration of these funds.

### *Sales tax*

It is levied by the Central or the State Government and which is subsequently collected by State Government.

### *Customs duty*

The customs duty on imports of minerals and minerals products is levied and collected by the Central Government.

### *Employment*

As per the country's 1991 census data, out of the total work force of 286 million main workers, only 27 million (9.4%) are in the organised sector and 259 million (90.6%) are in the unorganised sector. In 1991, the mining sector employed about 0.8 million workers. The workforce in the unorganised mining sector is not available but some estimate put it at 0.5 million. The employment of women in the organised sector (both public and private sectors) as on march 1999 was about 4.83 million which is 17.2% of the total organised sector employment in the country. Of this, the employment of women in the mining and quarrying division was 68,600 which is about 10% of the total employment in the organised mining and quarrying sector. It is also reported that the employment of women has been declining in the last decade in the mining sector but data is not available.

The daily employment in mining sector was around 0.8 million in the early 1990's has been gradually declining and is estimated at 0.7 million in 1999. This reduction was on account of the fall of employment in coal mines and non metallic mines. During the year 1999, the share of the coal sector employment was 70 per cent of which 0.27 million (55%) were employed in underground mines and the balance in opencast mine and surface jobs. The details of daily employment in coal sector from 1951 to 1999 is given below in Table 10.

**Table 10** Average daily employment in coal mines (1951-1999)

Year	Average daily employment in million
1951	0.35
1961	0.41
1971	0.38
1991	0.55
1999	0.49

*Non coal mines*

In 1999, the estimated number of working non-coal mines (excluding oil & gas sector) were about 3100 out of which only about 1900 submitted returns to the DGMS. The average daily employment during the year 1999 was about 0.165 million as against 0.23 million in 1991 showing a 30% decline in employment during the decade. The details of employment for some minerals are given in Table 11. The average daily employment in underground mines was only 9%. In 1991 38,500 female workers were employed in the non-coal mines. Iron ore, limestone and manganese mines accounted for 44% of the total daily employment in non-coal mines.

**Table 11** Average daily employment in non-coal mines during 1999\*

Minerals	No. of mines	Average daily employment
Bauxite	89	4991
Copper	9	7344
Gold	10	6088
Granites	105	3880
Lime stone	403	29976
Iron-ore	211	38665
Manganese	130	14807

## 2.5 The current regulatory and policy framework

### Policy framework

*Industrial policy after independence*

In 1948, immediately after independence, the government introduced the Industrial Policy Resolution. This outlined the approach to industrial growth and development. The resolution emphasised the importance to the economy of securing a continuous increase in production and its equitable distribution and pointed out that the State must play a progressively active role in the development of industries. In 1954 the Indian Parliament accepted the socialistic pattern of society as the objective of social and economic policies. The adoption of socialistic pattern of the society as the national objective as well as

the need for planned and rapid development required that all industries of basic and strategic importance should be in the Public Sector. The industrial policy was comprehensively revised and adopted in 1956. The industries were classified into 3 categories having regard to the part which the State would play in each of them. In the first category will be industries, the future development of which will be exclusively the responsibility of the State. The first category includes iron and steel, coal and lignite, mining of iron ore, manganese ore, chrome ore, gypsum, sulphur, gold and diamond and mining and processing of copper, lead, zinc, tin, molybdenum, wolfram and atomic minerals and their development was the responsibility of the State.

To meet the new challenges from time to time the industrial policy was modified through statements in 1973, 1977 and 1980. These policies created a climate for the rapid industrial growth in the country. By the end of the 7<sup>th</sup> Five Year Plan (1990) a broad-based infrastructure had been built up. Basic industries had been established. A high degree of self reliance in a large number of items – raw materials, intermediates, finished goods – had been achieved. New growth centres of industrial activity had emerged and a large number of engineers, technicians and skilled workers had also been trained.

#### *Economic reforms*

India embarked on major structural economic reforms in 1991 encompassing almost all sectors of the economic viz. Industry, trade as well as financial sector. The main philosophy behind these reforms was the integration of the Indian economy with the global economy, dismantling controls, welcoming foreign investments and new state of the art technology, promoting productivity and restructuring the public sector.

In 1991, the Government of India made a statement on a new industrial policy. The major objectives of this policy package were to build on the gains already made, correct the distortions or weaknesses, maintain a sustained growth in productivity and gainful employment and attain international competitiveness. In pursuit of the above objectives the GOI decided to take a series of initiatives in respect of policies relating to industrial licensing, foreign investment, foreign technology agreements, public sector and the Monopolies and Restrictive Trade Practices (MRTP) Act.

#### *National mineral policy*

Minerals are valuable natural resources being finite and non-renewable. They constitute the vital raw material for many basic industries and are a major

resource for development. Management of mineral resources is the responsibility of the Central and State Governments in terms of Entry 54 of the Union List (List I) and Entry 23 of the State List (List II) of the Seventh Schedule of the Constitution of India. Management of mineral resources has therefore to be guided by long term national goals and perspectives. The country is not endowed with all the requisite mineral resources. It is therefore imperative to achieve the best use of available mineral resources through scientific methods of mining, beneficiation and economic utilisation. These aspects constitute the essentials of the National Mineral Policy which has evolved over the years and was formulated in 1993, in line with the liberalisation and the globalisation of the Indian economy. The National Mineral Policy excludes fuel minerals which are dealt separately by the respective ministries. The policy also emphasises certain new aspects and elements like mineral exploration in sea bed, development of proper inventory, proper linkage between exploitation of minerals and development of mineral industry, preference to members of the Scheduled Tribes (indigenous people) for development of small deposits in Scheduled Areas, protection of forests, environment and ecology from the adverse effects of mining, enforcement of mining plan for adoption of proper mining methods and optimum utilisation of minerals, export of minerals in value added form and recycling of metallic scrap and mineral waste.

The central theme of the Industrial Policy, 1991 and National Mineral Policy, 1993 have led to notable amendments in the Mines and Minerals (Regulation and Development) Act 1957 in 1994 and 1999 and Mineral Conservation Rules, 1988 in 1995 in line with the changed policy in the sector. While on one hand the economy demanded stimulation, there was also a need to safeguard the national interest in the area of conservation, environment and scientific development. As a result of this, the following broad features emerge:

1. The new policy stipulates that the induction of foreign technology and participation in the arena of exploration and mining in case of high value and scarce minerals shall be pursued.
2. Earlier the foreign participation was allowed only if the investor agreed to the transfer of technology or a major exports commitment. The foreign equity was in general restricted to 40 per cent. In case, a higher equity was permitted, this was allowed with only strict terms and conditions. Foreign equity is now permitted automatically up to 50 per cent by the Reserve Bank of India and the approvals are given within two weeks.

3. The Foreign Investment promotion Board (FIPB) invites, negotiate and facilitate 100 per cent investment from international companies on the basis of commercial viability and acceptable profitability.
4. Any company registered or incorporated in India can apply for a prospecting license or mining lease to concerned state government.
5. The thirteen minerals earlier reserved for exploitation by the public sector (iron ore, manganese ore, sulphur, chromite, gold, diamond, copper, lead, zinc, molybdenum, tungsten, nickel and platinum group of minerals) have been opened for private and also foreign investment.
6. In the interest of long term planning, the periods for which prospecting license and mining lease can be granted and renewed have been enhanced. The maximum period for which the PL can be initially granted has been increased to three years and the total period together with renewals have been made five years. The maximum period for which the mining lease is granted has been made 30 years and the minimum period is 20 years. Each period of renewal is also 20 years.
7. No mining lease can now be granted to a private or a public party without a proper mining plan including environmental management plan approved by Indian Bureau of Mines. The mining plan shall be reviewed after 5 years and a mining scheme shall be submitted for next 5 years.
8. The area under prospecting license has been increased to 10,000 sq. km from 25 sq. km for aerial reconnaissance and geophysical surveys. The limit for a single party and single area is 5,000 sq. km and for the whole country 10,000 sq. km. Progressive relinquishment of the areas has been made compulsory so that only 25 sq. km is left with the prospecting company at the end of three years.
9. Fifteen minerals have been de reserved from the First Schedule of the Act, which means that the State Government is not required to seek prior approval from the Central Government for granting PL or ML. These minerals include apatite and rock phosphate, barytes, gypsum, vanadium, kyanite, magnesite, molybdenum, nickel, platinum and other precious metals, sillimanite, silver, sulphur, and its ores, tungsten and vanadium ores.
10. The minerals (except fuel minerals and atomic minerals) which require prior concurrence of Central Government for grant of mineral concessions are only 10: (asbestos, bauxite, zinc, chrome ore, precious stones, copper ore, manganese ore, gold lead, iron ore).
11. Preferential right of the PL holder has been recognized for the grant of ML provided the party has carried out the actual prospecting.



12. Preference is given to the schedule tribes for the grant of mineral concessions of small deposits in the scheduled areas as has been stipulated in the National Mineral Policy.
13. As the mining operations involve acquisition of land owned by individuals also, compensation shall be paid to the owner annually at the rate decided by the State Governments. Also, efforts shall be made to ensure suitable rehabilitation of the affected persons.
14. Setting up of mineral based industries and production of minerals in value added form has been mentioned specially in the National Mineral Policy. The limit of 50 per cent is not applicable to the captive mines of a mineral processing plant. This means that the equity proportion allowed to the processing plant will be available to the captive mine as well.
15. Supply of data and information by agencies such as the Geological Survey of India has been now provided on payment basis.
16. The use of forest land for non- forest purposes is restricted. Even in case the land is owned by private parties. Mining even including the underground ones is a non-forest activity. In addition, no mining shall be ordinarily undertaken in identified ecologically fragile and biologically rich area.
17. The idea of conceptual mining plan has been introduced. This has been done in the interest of long term planning. Before commissioning mining operations, the ultimate size of the pit shall be determined and the dumping ground shall be so selected that the same shall not be carried out within the limit of the ultimate size of the pit except in case of concurrent backfilling.

Further amendments to MM (RD) Act, 1957 were carried out on 20.12.1999 and thereafter in MCR 1960 and MCDR 1988 on 17.1.2000. These amendments are summarized below:

1. The name of Mines and Minerals (Regulation and Development) Act, 1957 has now been changed to Mines and Minerals (Development and Regulation) Act, 1957 in order to emphasize that the stress is on development rather than on regulation.
2. The reconnaissance operations as distinct from prospecting have been defined. Conditions, criteria, area limits, scope of operations, etc. in regard to reconnaissance operations have been introduced in the relevant rules.
3. Limestone has been deleted from Part C of the First Schedule to the MMRD Act.
4. State governments are now authorized to renew PL and ML of non schedule minerals and for minerals specified in Part C of First Schedule to the Act.

5. The area restrictions of Reconnaissance Permit, PL and ML have been made applicable statewise rather than countrywise.
6. The provisions for curbing illegal mining have been strengthened by inserting a new section 23C in the Act.
7. The power for approving mining plan for mines other than the mines of category A has been delegated to the State Governments in respect of certain mining leases related to non-metallic industrial minerals.
8. Power of granting PL and ML for areas which are not contiguous has been delegated to the State Governments except in case of coal, lignite and atomic minerals.

### Coal sector

Coal is listed in Schedule One of the MMRD Act, 1957 and as such rights for prospecting and mining of coal are controlled by the Central Government. The Coal Bearing Areas (Acquisition and Development) Act 1957, was enacted and its purpose was to have greater public control over coal exploration and production by empowering the Central Government to acquire unworked land containing or likely to contain coal deposits.

Subsequently, the coking coal and non-coking coal mines were nationalised in two phases – coking coal mines in 1971-72 and non-coking coal mines in 1973. Nationalisation was a response to the urgent need to make large capital investment in the coal mines to meet the burgeoning demand; to prevent unscientific mining and to ameliorate the working conditions of labour in the industry. The Coal Mines (Nationalisation) Act was passed by Parliament in May 1973, under which coal mining was reserved for the public sector with few exceptions. In 1976, two exceptions to the nationalisation policy were introduced viz. (a) captive mining by companies engaged in the production of iron and steel and (b) the sub-lease to private parties of small pockets of reserves not amenable to economic development and not requiring rail transportation. The Coal Mines (Nationalisation) Act 1973 was further amended in 1993 to allow private coal mining for captive consumption for generation of power, washing of coal obtained from a mine and other end uses to be notified by Government from time to time in addition to the existing provisions.

## State government policies

A country's mineral policy serves two basic objectives – a) to provide guidance to the government in drafting the legislative and regulatory framework for implementing the policy and b) as a statement of the country's views on key issues and topics, providing potential investors with guidance as to the expectations of the government. While the central government broadly lays down the legal framework, the onus is upon the state governments, the owners of mineral wealth, to make conditions congenial for attracting investment.

The state of Rajasthan has been able to attract sizeable investment proposals in exploration whereas other states, albeit more rich in resources, have not been able to attract any investment, one reason for this could be that states like Andhra Pradesh, Karnataka, Madhya Pradesh and Orissa have not been able to work out a clear policy for mineral development. The policy initiatives which are required at the state levels to attract investment may be:

- a) evolving a simplified time bound framework for processing the mineral concessions
- b) Recognising mining as thrust area and reviewing applications/issues of the prospecting investors at the highest levels of administration
- c) Creating a data base of mines and minerals and making it available to the investors
- d) Some states like Karnataka, Chattisgarh (newly formed states), Jharkhand have come out with reviewed mineral policy to achieve sustainable development of the mining and mineral industry.

## Regulatory framework

### *Mining*

The Mining and Minerals (Regulation and Development) Act, 1957 lays down the legal framework for the regulation of mines and development of all minerals other than petroleum and natural gas. The relevant rules in force under the MMRD Act 1957, are the Mineral Concession Rules, 1960, and the Mineral Conservation and Development Rules, 1988. The health and safety of the workers is governed by the Mines Rules, 1955 and Coal Mines Regulation 1957 created under the jurisdiction of the Mines Act 1952.

The Mineral Concession Rules, 1960 outline the procedures and conditions for obtaining a Prospecting Licence or Mining Lease. The Mineral Conservation and Development Rules, 1988 lays down guidelines for ensuring mining on a scientific basis, while at the same time, conserving the environment. The provisions of Mineral Concession Rules and Mineral Conservation and

Development Rules are, however, not applicable to coal, atomic minerals and minor minerals. The minor minerals are separately notified and come under the purview of the State Governments. The State Governments have for this purpose formulated the Minor Mineral Concession Rules. A list of Acts, Rules, Legalstions and Orders relating to and/or impacting on the ownership of minerals, granting of rights to prospect and exploit minerals, land rights of surface access, environment, forestry are given in Annexure 5.

### Labour, trade unions, employees welfare, compensation

Under the Constitution of India, labour is a subject in the concurrent list where both the Central and State governments are competent to enact legislation subject to certain matters being reserved for the centre (Table 12).

**Table 12** Labour jurisdiction: Constitutional status

Union list	Concurrent list
Entry No.55: Regulation of labour and safety in mines and oil fields	Entry No.22: Trade Unions; industrial and labour disputes
Entry No. 61: Industrial disputes concerning Union employees	Entry No.23: Social security and insurance employment and unemployment
Entry No.65: Union agencies and institutions for 'Vocational training'	Entry No.24: Welfare of labour including conditions of work, provident funds, employers 'invalidity and old age pension and maternity benefit

Safety, health and welfare of workers in mines are regulated by the Mines Act, 1952 and the rules and regulations formed thereunder. The employment in mines, trade unions rights and liabilities, dispute resolution, contract labour are regulated under different Acts and Rules framed thereunder. A list is enclosed vide Annexure 6.

The main features of the legislative framework comprise:

- (a) Statutory employment rights - the protections and entitlements conferred by law on employees, including employees in the mining industry. Such rights have been introduced and extended over time and are to be found across a number of different Acts, Rules and Regulations;
- (b) Trade Union rights and liabilities - the rights and liabilities of Trade Unions in respect of registration, organisation and objects, recognition and immunities from civil action relevant to the conduct of collective bargaining and industrial action. Again, these are statute-based, but have been subject to extensive interpretation by the Courts;

- (c) The collective bargaining process - the arrangements under which the mining companies and other major employers in the mineral sector negotiate with recognised Trade Unions to establish terms and conditions of employment, and deal with related matters. This includes, in particular, the working of the Joint Bipartite Committee for the Coal Industry (JBCCI);
- (d) Statutory provision for dispute resolution - based on the Industrial Disputes Act, 1947. The provisions cover both individual complaints and grievances, and collective disputes;
- (e) The statutory control of contract labour - based on the Contract Labour (Regulation and Abolition) Act, 1970 and notifications thereunder.

### **Trade unions**

The central Trade Unions recognised in the mining industry currently are:

- Indian National Trade Union Congress (INTUC)
- All India Trade Union Congress (AITUC)
- Centre of Indian Trade Unions (CITU)
- Hind Mazdoor Sabha (HMS)
- Bharatiya Mazdoor Sangh (BMS)
- United Trade Union Congress (UTUC)
- National organisation of labour (NLO)
- National Federation of Indian Trade Unions (NFITU)
- United Trade Union Centre (LS)

The list central trade union organisations are given in Annexure 7. To these central unions there are affiliated a large number of local and regional unions - for example the Indian National Mineworkers Federation, which is affiliated to INTUC. Subscriptions of members are split between the central union and its various affiliates. Each of the central unions has established a strong and effective affiliation with one or the other of the major political parties; and all maintain broad support for a nationalised mining sector. The trade union activities have focussed on the 9% of organised workers whereas the unorganised workers do not receive sufficient attention from them.

#### *National trade unions congress*

National Trade Union Centres are recognised by the Government of India for being invited participation of the Indian Labour Conference which is a policy making and consultative body. This is a tripartiate meeting of Trade

Unions/Labour, Employers, and Government. The criteria for recognition as a national trade union centre is.

- A national centre should have at least five hundred thousand members
- Minimum of five trades in their membership
- Geographically these national centres should have membership in at least five states of the Indian Union

These criteria and norms were accepted by the Indian Labour Conference and presumed to be in force. Unfortunately a lot of information gap with regard to policy attitudes and approaches makes it difficult to make any comment on policies with some degree of certainty. The membership figures have always been a matter of dispute for a variety of reasons and subject matter of court cases against the Government of India, Ministry of Labour. There is therefore no reliable membership data. Each trade union centre claims several times more than what is published by government after verification done by the Labour Ministry through its administrative network of Labour commissioners based in the States of Indian Union. Two of the national trade unions centres – UNTUC and HMS are affiliated to International confederation of Free Trade Unions and the Brussels – based International Trade Union Centre. The AITUC and CITU affiliated to recently revived World Federation of Trade Unions (WFTU) which had collapsed after break up of Soviet Union and the erstwhile communist countries of Eastern European countries out of the Soviet controlled system.

### Dispute resolution

India has a comprehensive and highly developed system for the resolution of both individual and collective employment disputes. The system is fully comparable, in principle, with the best systems in Australia, the European Union and the USA. The statutory basis is provided by the Industrial Disputes Act, 1947. The key institutions are:

- (a) Works Committees. These are consultative bodies set up at establishments with not fewer than 100 employees, with equal representation of employer and employees. This is the first stage of dispute resolution, and provides, in practice, one of the most important and effective ways in which management and unions work together to identify problems and avoid disputes;
- (b) Conciliation Officers. These are Government appointees, either for a specified area or a specified industry. Their function is to help to resolve individual or collective disputes;

- (c) Boards of Conciliation. These are created on an 'as needed' basis, by notification in the Official Gazette, to promote settlement of particular disputes. They are normally constituted with an independent chairman, plus two or four members representing parties to the dispute;
- (d) Courts of Enquiry. Again, these are set up on an 'as needed' basis by notification in the Official Gazette. Their function is to enquire into any matter connected with an industrial dispute. They are constituted with one or more independent persons, with one person to act as Chairman;
- (e) Labour Courts. These are permanently established Courts specialising in the adjudication of individual or collective disputes in the employment field. They comprise a judicially qualified Presidential Officer, sitting alone. The jurisdiction of Labour Courts is specified in the second schedule of the Act of 1947;
- (f) Tribunals. Again, these are permanently established and have the task of adjudicating industrial disputes covered by both the second and third schedules of the Act of 1947, or such other matters as may be assigned to them under the Act;
- (g) National Tribunals. These are appointed by notice in the Official Gazette to adjudicate industrial disputes involving questions of national importance, or where industrial establishments in more than one state are likely to be involved.

Effective arrangements for dispute resolution are, in any circumstances, required to secure the orderly conduct of industrial relations. In periods of change, however, their importance is magnified. Decentralisation of responsibilities and decision making on labour issues will inevitably generate disputes that, unless they are urgently addressed and promptly resolved, may jeopardise the transition to liberalised labour markets in the sector.

The institutional framework for dispute resolution provided under the Industrial Disputes Act, 1947 is sound and, as noted, stands comparison with the best systems elsewhere. In operation, however, the system is not always satisfactory. In particular, there are unacceptable delays in the disposal of routine cases by Labour Courts.

#### *Labour welfare fund for workers in unorganised sector*

The concept of labour welfare fund has been evolved in order to extend or measure of social assistance to workers in the unorganised sector. Separate legislations have been enacted by Parliament to set up welfare funds to be

administered by the Ministry of labour (GOI), to provide housing, medical care social security, educational and recreational facilities to workers employed in certain non-coal mines in the unorganised sector. The scheme of welfare funds is outside the framework of specific employees and employer relationship in as much as the resources are raised by the government on a non-contributory basis and delivery of welfare services is effected without linkage to individual workers contributions.

The Ministry of Labour (Labour welfare wing of labour welfare Division) is responsible for the administration of these funds which have been set up under the following Acts of Parliament:

- The Mica Labour Welfare Fund Act 1946
- The Limestone and Dolomite Mines Labour Welfare Fund Act 1972
- The Iron Ore Manganese ore and Chromite Ore Mines Labour Welfare Fund Act 1976

The welfare schemes formulated under the above enactments cover health (Hospitals, ambulances, maternity benefit etc), housing (financial assistance to mine management for contribution of low cost houses, integrated housing scheme); education (financial assistance to children of mine workers, mid-day meals etc). Recreation facilities and water supply (financial assistance for sinking of wells and execution of water supply schemes). Finances for the funds set up under the above enactments are raised through the levy of cess as detailed below:

- Iron ore – Rs.1.00/tonne on export/internal consumption
- Manganese ore – Rs.2.00 / tonne on export/internal consumption
- Chrome ore – Rs.4.00/tonne on export/internal consumption
- Limestone & dolomite – Rs.1.00/tonne on internal consumption
- Mica – 4.5% ad-valorem on export.

Welfare funds have also been created for the welfare of different categories of workers by the governments of Maharashtra, Orissa, Madhya Pradesh, Goa and Gujarat. The welfare funds which follow a sectoral approach are in addition to a large number of poverty alleviation and employment generation programmes like IRDP, IAY, JRY, EAS, EGS, TRYSEM, DWACRA, Tribal sub-plan, special component programme for scheduled castes etc. which follow a regional approach and for which most of these workers are also eligible. The various Acts as applicable to the organised sector workers in the unorganised sector, these are:



- The Workmen's Compensation Act 1923
- Payment of Wages Act
- Minimum Wages Act
- Maternity Benefit Act
- Payment of Gratuity Act
- The Employees State Insurance Act

### Bonded labour

The Government of India has consistently maintained a proactive approach to the issue of forced or bonded labour in the country. It recognises this evil system as a gross infringement of the fundamental Human Rights of the affected citizens and is implacably committed to its total eradication in the shortest possible time. India has ratified ILO Convention No.29 (Forced Labour Convention 1930) on 30.11.1954. Following the ratification, the Bonded Labour System (Abolition) Act, 1976 was passed by the Parliament. It freed unilaterally all the bonded labourers from bondage with simultaneous liquidation of their debts. The Act is being implemented by the State Governments. Since the enactment of the Act, it is reported that as many as 2,80,411 bonded labourers have been identified upto March 2001 in 13 states. Out of these, 2,56,825 bonded labourers have reportedly been rehabilitated by the respective state governments under the central sponsored scheme (about Rs.600 million has been provided by the Central Government).

Though much information is not available as to the extent of bonded labour system in small mines operating in the country, it can be assumed that the practice may be prevalent in a few states. All concerned state governments have constituted vigilance committees at the district and sub-divisional levels for taking suitable actions as per the Act, against employment of bonded labour.

### Environmental legislation

The Constitution of India provides the necessary directives and powers to frame and enforce environmental legislation. The Constitution classifies the various legislative subjects into three categories, namely, Union List, State List and Concurrent List. The legislation in respect of topics given in the Union List is enacted by Parliament. Items included in the State List are enacted by the state legislatures. The Concurrent List specifies the subjects that are to be looked after jointly by the Centre and State governments. In the national interest and in certain special circumstances, the Constitution enables Parliament to legislate with respect to matters in the State List under Article 249 and 252. Under

Article 253, the Parliament is empowered to legislate on all subjects of international agreements to which India is a party.

The Indian concerns for environmental protection and improvement of human environment may be considered to have started in earnest with the participation of India in the UN conference on “Human Environment” held in Stockholm in June, 1972. In order to implement the recommendation of this conference, the Government of India enacted several Acts on environment. The Water (Prevention and Control of Pollution) Act 1974 was promulgated under Article 252, as water is a state subject. On the other hand, the Air (Prevention and Control of Pollution) Act, 1981 and the Environment (Protection) Act 1986 were promulgated under Article 253.

The implementation of environmental legislation is a three-stage process for the mining sector. There are environmental requirements associated with (a) the initial application for the opening of the mine, (b) the operation of the mine and (c) the closure of the mine. The application to open the mine requires an assessment of impacts of the proposed activities on the existing environment and submission of an environmental management plan for the operation and closure of the mine. The environmental clearance for the mine, if granted, stipulates any conditions, over and above the general requirements of the environmental legislation, which may attach to the permission to operate the mine.

### Legal framework

There are five Acts, which with their associated Rules, Notifications, etc directly applicable to the management of the environment. They are:

- (a) The Water (Prevention and Control of Pollution) Act 1974
- (b) The Water (Prevention and Control of Pollution) Cess Act 1977
- (c) The Air (Prevention and Control of Pollution) Act 1981
- (d) The Environment (Protection) Act 1986
- (e) The Public Liability Insurance Act 1991

These environment specific laws must be read in conjunction with the Mineral Concession Rules 1960 (MCR) that provide details of the data to be submitted to the State authorities with respect to an application for a mining lease. The list of requirements contains some references to environmental matters. The common objectives of these pieces of environmental legislation are as follows:

- (a) To arrest further damage to the environment and ecosystem resulting from mining.

- (b) To take positive steps towards conservation of the environment.
- (c) To take measures to restore the environment in areas damaged including such measures as reclamation of degraded land.
- (d) To create authorities to administer the policy and contents of the legislation.
- (e) To provide penalties and prosecution for violation of laws.

*The Environment (Protection) Act; 1986 including Rules 1986*

In 1986, the Union Government enacted the Environment (Protection) Act (EPA) with a view to rectifying omissions in the legislative coverage, which until then had been done on sectoral basis. The EPA, like the Air Act preceding it, invokes for its source of authority, the Stockholm Declaration of 1972, placing it thereby in the Constitutional setting of Article 253. The EPA consequently extends to the whole of India. The Central Government is empowered by the EPA to take all such measures as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment, and preventing, controlling and abating environmental pollution. A number of notifications have been issued under the EPA. Some of the important notifications/amendments, which affect mining projects, are as follows:

- (a) Restriction on mining in certain identified ecologically sensitive/fragile areas (e.g. in Wild life Sanctuaries, National Parks, and adjoining National Monuments, areas of cultural heritage, ecologically fragile areas, areas rich in biological diversity, genepool, etc).
- (b) Environmental Impact Assessment (EIA) for development projects (1994).
- (c) Amendment to the EIA notification making Public Hearing mandatory for development projects (1997).
- (d) National ambient air quality standards for industrial, residential, rural and sensitive areas.
- (e) General standards for discharge of effluents from mining and mineral processing activities.
- (f) Ambient air quality standards in respect of noise for industrial, commercial, residential areas and silence zones.

*Mineral Concession Rules, 1960*

Mineral Concession Rules (MCR) stipulate that the “mining plan” shall incorporate a plan of the area showing the water courses, the limits of reserved and other forest areas, the density of trees, an assessment of impact of mining activity on forest land surface and environment including air and water pollution, details of scheme of restoration of the area by afforestation, land

reclamation, the use of pollution control devices and such measures as may be directed by the Central or the State Government from time to time. All these requirements are incorporated in an Environmental Management Plan (EMP), which forms an integral part of a mining plan.

## Forests

### *Introduction*

The Indian Forest Act, 1927 enacted during the British rule, aimed “to consolidate the law relating to forests, the transit of forest produce and the duty leviable on timber and other forest produce”. This Act deals with reserved forests, protected forests, village forest and control over non-government forests. It gives a comprehensive definition of ‘forest produce’. Section 26 (1) lists acts prohibited in reserved forests, which includes clearing or breaking any land for any purpose.

After independence, a Forest Policy was formulated in 1952, which aimed at a forest coverage of one third of the total land area of the country. In spite of the policy, extensive diversion of forest land for non-forest purposes took place over the years. Based on available information, the total forest area diverted for non-forestry purposes between 1950 and 1980 was 4.5 million ha. i.e. at an annual rate of 0.15 million ha. In order to regulate the unabated diversion, the Constitution was amended in 1976 (Forty Second Amendment) which inscribed “Forests” under a new item 17A in the Concurrent list of the Seventh Schedule to the constitution. Subsequently the Forest (Conservation) Act was enacted in 1980 as a long felt measure to protect and conserve forests. These measures resulted in considerable reduction of diversion of forest area for non-forestry purposes.

### *Policy and legislation*

The major Acts and their rules, guidelines, and policies which directly apply to the management of the Forests and Wildlife are:

- (a) Indian Forest Act, 1927
- (b) Wildlife Protection Act 1972 (as amended up to 1991) with its many Rules.
- (c) Forest (Conservation) Act 1980
- (d) Forest (Conservation) Rules 1981
- (e) Environment (Protection) Act 1986 and Rules (Discussed under the Environment Section).
- (f) National Forest Policy 1988

In addition the Supreme Court has taken several decisions which have a bearing on forestry and wildlife matters.

*Forest (Conservation) Act 1980 and Rules 1981*

The Forest (Conservation) Act 1980 (FCA) provides an adequate structure for the preservation of the forest resources of India. The FCA seeks to restrict the powers of State Governments in respect of dereservation of forests and use of forest lands for non-forest purposes. To this end, it has created an Advisory Committee in the Ministry of Environment and Forests (MoEF), Government of India, to oversee the implementation of the statute.

*Wildlife Protection Act 1972 (amended up to 1991)*

The Act as amended up to 1991 prescribes protection of animals and regulates their improvement. The Act is very rigid and is supported by various Supreme Court decisions. It is difficult to obtain diversion of forest rich in wildlife, or coming in the pathway of wild animals etc. In case of sanctuaries and National Park, diversion is not generally allowed unless the project is of national importance and no other alternative is available. In such cases the no objection has to be initially accorded by the Indian Board of Wildlife and the State Legislature before consideration by MoEF for diversion.

*The National Forest Policy 1988*

The National Forest Policy 1988 has given greater emphasis to the conservation and ecological aspects of forest, wildlife, and environment. The salient features of the new Forest Policy are:

- (a) Maintenance of environmental stability through preservation and restoration of ecological balance.
- (b) Conservation of the natural heritage of the country by preserving the remaining natural forests and protecting the vast genetic resources for the benefit of posterity.
- (c) Meeting the basic needs of the people, especially fuelwood, fodder and small timber for the rural and the tribal people.
- (d) Maintaining the intrinsic relationship between forests and the tribal and other poor people living in and around forests by protecting their customary rights and concession on the forests.

### *Diversion of Forest Land*

Mining including underground mining is a non-forestry activity. Therefore, prior approval of the Central Government is essential before a mining lease is granted in any forest area. The FCA applies not only to the surface area, which is used in mining but also the entire underground mining area beneath the forest.

No mining activity is permitted in National Parks and Wildlife Sanctuaries. All proposals involving forest land more than 20 ha. in plains and more than 5 ha in hills must be accompanied by a cost-benefit analysis to determine whether diversion of the forest land for non-forestry use is in the overall public interest. The parameters according to which the cost aspect will be determined and the parameters for assessing the benefits accruing are given in MoEF document. If the project involves displacement of people, a detailed rehabilitation plan shall be submitted along with the proposal. The SC and ST population should be separately considered and a plan for their rehabilitation should be in cognisance with their socio-economic, cultural lifestyle.

### *Compensatory afforestation*

Compensatory afforestation is one of the most important conditions stipulated by the Central Government while approving proposals of dereservation or diversion of forest land for non-forest uses. Compensatory afforestation must be done over equivalent area of non-forest land. This land should be close to reserved forest or protected forest to enable the forest department to effectively manage the newly planted area. The identified non-forest land has to be transferred to the ownership of the State Forest department and declared as Protected Forests so that the plantation raised can be maintained permanently. The transfer must take place prior to the commencement of the project.

## **Resettlement and rehabilitation of project affected population**

### *Background and approach*

A major challenge confronting any investor in India, where project implementation involves involuntary displacement of people, is the equitable and effective resolution of R & R issues.

Inevitably, the issues are acute in a country of one billion people and with one of the highest population densities in the world; where 70% of the population subsist on agriculture and 36% are below the poverty line; and where an illiteracy rate of 52% forecloses access to skilled or “knowledge” jobs. These factors are experienced most severely in the mining areas which, for the most

part, are located in isolated and less developed regions of the country, predominantly inhabited by Scheduled Castes and Scheduled Tribes, and by other economically weak and disadvantaged sections of society. The problem is compounded by growing reliance on opencast mining, requiring increased areas of land and entailing large-scale displacement of project affected people (PAPs).

### *Legislation and policy*

There is no legislation at the Central Government level on R & R. In 1993, GOI prepared the first draft of a national policy setting out compensation packages and guidelines for R & R. Following widespread consultation within government, however, the draft is still under consideration.

Some States, namely Madhya Pradesh, Maharashtra and Karnataka, have enacted legislation for R & R. Others, including Gujarat and Orissa, have adopted formal R & R policies. Similarly, some PSEs have formally adopted R & R policies. Notable among these is Coal India Limited (CIL), who have a comprehensive R & R policy document.

Compensation for land, houses and other structures is determined by the provisions of any of the following Acts, depending upon the law applied for acquisition:

- (a) The Land Acquisition Act, 1894 (LAA);
- (b) The Coal Bearing Areas (Acquisition and Development) Act, 1957 (CBAADA);
- (c) Relevant State laws.

### **Fiscal regime**

Indian companies are taxed in India for their income anywhere in the world. Foreign companies are taxed in India for their income which arises from operations in India. This includes royalty, fees for technical services, interest, and gains from sales of capital assets situated in India and dividends from Indian companies. Indirect taxes are also required to be paid which include excise duties, custom duties, sales tax and others such as octroi, real estate tax, etc. Under the Mines and Minerals (Development and Regulation) Act, 1957, prospecting fee, surface rent, dead rent and royalty is required to be paid. The Government of India offers a wide range of concessions to investors in India engaged in mining sector. A few of the concessions are as follows:

- Tax holiday: Mining companies operating in backward areas are entitled to tax holiday for the initial period of five years from commencement of production and a partial tax holiday thereafter.

- Incentive for new venture: Newly established mining companies are eligible for a deduction of 30 per cent of gross total income for 10 years subject to certain conditions. However, such incentives will not be available in case the benefit of tax holiday is availed.
- Depreciation allowance: The benefits of accelerated depreciation are available for tax purposes. As a result, the total amount of depreciation which is allowable as a tax deduction does not change but the company is allowed to make such deduction earlier in project's life.
- Deduction in respect of export turnover: Deduction of 100 per cent export income is granted for export of specified processed minerals and ores. To claim this deduction, the sale proceeds of exports must be brought into India in convertible foreign exchange within a specified time period.
- Expenditure on prospecting, extraction and production of minerals: The expenditure incurred by an Indian company engaged in any operation relating to prospecting for, or extraction or production of any mineral during the five year period ending with the year of commercial production is allowed as a deduction from the total income to the extent of one-tenth of the amount of such expenditure. No deduction shall be allowed on the expenditure on the acquisition of site and other capital expenses on which depreciation is claimed.
- Expenditure on scientific research: Capital and revenue expenditure incurred by the assessee who himself carries on scientific research is allowed as a permissible deduction. A weighted deduction of 125 per cent is allowed for payments made to specified universities and laboratories for carrying out scientific research.
- Expenditure on know-how: Any lump sum paid for acquiring know-how is deductible in six equal instalments in a period of six years.
- Preliminary expenditure: Preliminary expenses incurred by an Indian company before the commencement of business are allowed as a deduction in ten equal instalments.
- Expenses for environmental protection: Amounts paid to approved association or institutions for programs of conserving natural resources are allowed as a deduction in the computation of taxable income.

### **Tax treaties**

The tax treaties signed by India are based generally on United Nation practices. India has signed treaties with a large number of countries for avoidance of double taxation of income. This has resulted in relatively lower tax cost for



foreign companies doing business in India. Some of the countries with which such treaties have been signed include Australia, Austria, Bangladesh, Belgium, Germany, Greece, Hungary, Nepal, Netherlands, New Zealand, Norway, Syria, Tanzania, Thailand, etc.

In the absence of tax treaties, even with the tax holidays it is not necessary that the investor will have the benefit, as the party is still taxed in its own country. It is also seen that the tax holiday is for a limited period whereas the project is for a long period. In case, the prices of minerals are low, the eventual taxation even with holiday in the initial period can make the project unviable.

### *Foreign investment*

Being aware of the vast potential of the mineral sector, the Indian Government, has been consistently and in a pragmatic manner opening up the previously controlled regime to usher private investment in the sector and infuse funds, technology and managerial expertise. The opening up of the Indian mining sector has, therefore, generated considerable global interest. The Indian mining sector was opened up to Foreign Direct Investment in 1993 after the announcement of the New Mineral Policy. Initially, all proposals were considered on a case to case basis by the Foreign Investment Promotion Board (FIPB). FDI policy in the mining sector was further liberalised in January 1997 which opened up an “automatic approval” route for investments involving foreign equity participation upto 50% in mining projects, and upto 74% in services incidental to mining.

The above sectoral guidelines in the mining sector were reviewed by the Department of Mines and the following changes in the sectoral caps have been made with effect from 11<sup>th</sup> February 2000 towards further liberalisation of the mining sector.

- There will henceforth be no difference in the caps on foreign equity holdings to be allowed at the stages of exploration and that of mining;
- For all minerals with which the Department of Mines is concerned other than diamonds & precious stones, foreign equity holding upto 100% will be allowed on the automatic route, for both exploration and mining.
- In case of diamonds & precious stones, foreign equity upto 74% will be allowed on the automatic route for both exploration and mining operations. For proposals seeking higher than 74% foreign equity, the cases will have to come to FIPB for clearance.
- Foreign equity upto 100% will be allowed on the automatic route for processing of minerals and metallurgy.

- There will be no requirement of NOC from an existing joint venture partner for fresh investments. The prospective investor will only have to give a declaration that he has no existing joint venture for the same area and/or the particular mineral.

#### *Coal and lignite*

- Private Indian companies setting up or operating power projects as well as coal or lignite mines for captive consumption are allowed FDI up to 100%.
- 100% FDI is allowed for setting up coal washeries, subject to the condition that the company shall not do coal mining and shall not sell washed coal or sized coal from washeries in the open market.
- FDI up to 74% is allowed for exploration or mining of coal or lignite for captive consumption.
- In all the above cases, FDI is allowed up to 50% under the automatic route subject to the condition that such investment shall not exceed 49% of the equity of a PSU.

## 2.6 *Small scale mining sector*

### What is small scale mining?

Small scale mining is carried out in all countries (both developed and developing) and it is estimated that it contributes as much as 15% of the global value of mineral production. Indian mining industry also operates a number of small mines spread throughout the country. Many attempts have been made by researchers in the last three decades to define small scale mining and a number of arbitrary definitions have evolved. These definitions may be categorised into two distinct groups, one uses the mine production as the only yardstick and the other treats the mineral produced by the mine being its marketable output. However, none of these approaches are complete in itself. In India a Committee on Small Mines was set up in 1986 by Mining Geological and Metallurgical Institute of India (MGMI). According to this committee, a small mine is one in which the raw ore production does not exceeds a certain limit depending on the mineral/ore; the investment will not exceed Rs.6 million; and if beneficiation / processing plants are installed the investment may not exceed Rs.10 million.

According to the International Labour Organisation (ILO) the small scale mining falls into two broad based categories. The first is the mining and quarrying of industrial minerals and construction materials on a small scale. These operations are mostly for local markets and they exist in every country. Regulations to control and tax them are often in place. Informal or illegal

operations at this level are generally due to a lack of inspection and the lax enforcement of regulations rather than to the lack of a legal framework, much the same as for small manufacturing plants. The second category is the mining of relatively high-value minerals, notably gold and precious stones.

### Small scale mining in India

The definition of small scale mining operations is highly country specific. A mine which comes under the category of small mines in one country may not be considered so in another country. The definition also depends on a number of factors such as persons employed, bulk and value relationship of mineral, size of the mining lease, size of mineral reserve in that lease, production capacity, labour productivity etc., individually or a combination of any of these factors. Therefore, if a small mine is taken as that operation which is defined by the absence of the regular use of deep blast hole drills, large scale blasting and heavy earth moving equipment with employment of manpower limited to 150 persons underground and 400 overall, then about 95 per cent of mines in India will come in to the category of small mining operations. Out of the 4 fuel, 11 metallic and 49 non metallic industrial minerals, as many as 36 are mined exclusively by small scale sector and another 14 are mined partly by small scale and partly by medium scale operations. Valuedwise about 20 per cent of the total production is contributed by small mining operations. Of this figure, 15 per cent comes from major minerals and 5 per cent from minor minerals. Small size operations seem to be more common in the private sector.

The present size of mining operations (productionwise) can be gauged from the aggregate production of minerals and the number of operating mines in respect of 20 minerals which are fairly representative of the non – fuel mineral profile. It will be seen that the average size of mining operations in respect of copper, lead and zinc is much more than other minerals (Table 13). However, these minerals do have small mining operations, which is indicated by the production levels at a number of mines (Agnigundala, Ingaldhal, Kalyadi, Mailaram., Dariba and Bhotang).

**Table 13** Average size of mining operation for some minerals

S.No.	Mineral	Production (thousand tonnes)	Number of mines	Annual production per mine (thousand tonnes)
1	Apatite	12	2	6
2	Asbestos	19	37	0.51
3	Barytes	363	11	33
4	Bauxite	7050	180	39

5	Chromite	1738	21	83
6	Copper ore	3085	10	309
7	Dolomite	2815	111	25
8	Fire clay	400	96	4.2
9	Gold ore	570	8	71
10	Gypsum	3247	44	74
11	Iron ore	74946	214	350
12	Kaolin	806	154	5.2
13	Kyanite	6	3	2
14	Lead-zinc	2755	8	344
15	Limestone	128787	527	244
16	Magnesite	326	16	20
17	Manganese ore	1586	133	12
18	Silica sand	1558	154	10
19	Sillimanite	15	4	3.75
20	Steatite	557	153	3.6

Small scale mines are situated mostly in underdeveloped areas, quite a few operate in clusters and some of them are artisanal. A large number of them are tackling small mineral deposits of ores which may not be amenable to large-scale operations. Such minerals are: apatite, asbestos andalusite, baryte, bauxite, bentonite, china clay, chromite, feldspar fireclay, graphite, magnetite, mica, ochres, soap stone, quartz, garnet, varieties of rare earths, iron ore, manganese, zinc, fluospar, phosphate, magnesite, granite, marble slate, limestone, etc. In view of the low tenor of ores and small size of some deposits, small scale mining is of great relevance. To make them cost-and-quality-competitive, induction of latest but flexible technology can be great value. At present, however, out-dated technology, higher costs of production and poorer quality of products is major handicaps.

### Advantages of small scale mining

The small-scale mining sector has certain advantages which are very much pertinent to the Indian socio-economic structure. These are:

- Small mining operations have high employment potential for workers of all types – skilled, semiskilled or unskilled, even in remote rural areas. About one and half decade back 50% of Indian mining workforce was engaged in small mines (Argall, 1976). A recent estimate indicates that around 0.5 million workers in this country are employed by this sector (Berger & Carman, 1990).
- Small mining may also fit in well in the Indian social structure, especially if seasonal operations are required because of the cultivation in the same area.

- The above two factors may collectively act as a restraint to rural population on urban migration.
- Developments of small mines are accomplished more rapidly and at a fraction of the cost of large mining ventures.
- Small scale mines sometimes form the basis for local processing and manufacturing industries either on small or cottage scale, or as feeders to large centralised plants, thus help the socio economic growth of their surroundings.
- Small mining activities respond readily to alterations in economic balance caused by changes in mineral price and provide greater stability to product cost.
- Exploitation being low, exploration success in these mines is usually greater than in larger ventures. Small operations sometimes lead to the recognition of major deposits.

### Some serious shortcomings

- Less-than-subsistence wages, appalling working conditions and disregard to safety and health are very common.
- Environmental protection is seldom more than rudimentary: Inappropriate technology, lack of consciousness towards mineral conservation, and inadequate financial support often lead to disorganised and wasteful exploitation of mineral deposits.
- Sometimes knowledge and enforcement of statutes are totally missing.
- This sector in India is mainly run by private entrepreneurs.

Sometimes, due to remoteness of the locations of small mines and gaps in communication, many of them, specially those of minor minerals, are worked beyond the knowledge of law enforcing authorities like the Directorate General of Mines Safety (DGMS). Neither the mine management, nor even the concerned government departments are duly aware of the statutes concerned with mining activities. As a result, these mines are often worked in unsafe and unscientific fashion.

### Cluster mining

The concept of small scale cluster mining as a means of sustained employment and eco-friendly mining operation is gradually attracting attention all over the world. But the problem of development of such clusters are so diverse (both technical and socio-economic) that each country needs an in-depth study in each

case. In India, the cluster concept has been experimented in Pachami-Hatgacha (in the State of West Bengal) stone mining activities. It is reported (by NISM) that in the cluster the employment has increased from about 200 to 10,000 in a period of two decades, providing minimum sustenance to a large number of people.

There are two categories of cluster-mining: i) developed naturally in the course of decades of operation and ii) pre-planned and executed under same authority fairly quickly. By way of example, Pakur Stone mining in Bihar, Makrana Marble mining in Rajasthan and Naini Glass Sand mining in Uttar Pradesh can be classified under the first category and Pachami-Hatgacha Stone mining in Birbhum in West Bengal and, in a way, Panna Diamond mining under the second category.

Naturally developed cluster-mining takes a long time to develop and gives rise to employment in a slow and halting manner. This happens as and when the number of mines and production gradually increase some-times with erratically growing market demand and slow development of infrastructural facilities. In such clusters proper and timely geological investigations and scientific analyses and studies are not carried on in time, leaving the entire operation to hit-and-miss technology except in a few isolated cases of enlightened individuals.

But in the case of preplanned clusters all the necessary preliminary investigations are made and the entrepreneurs helped and guided to carry on operations in an enlightened manner. Thus the development is much quicker on a sure footing leading to production and employment. Moreover, in such cases, chances of introduction of more effective mining methods and better technology (intermediate) is easier and the entrepreneurs are more receptive to suggestions and advice. This was realised during two NISM organised Workshops (1995) on motivating small mine owners for eco-friendly mining operations. But unfortunately, in most of these areas the total advantage of cluster mining can not be harvested for want of adequate follow up and supportive actions by many of the government authorities who are more interested in collecting royalty income than in improving mining activities consistent with safety and protection of environment. They are not much interested in gradually modernising mining and processing practices which not only improve labour wages but also government revenue income.

### Future scenario

Small scale mining provides employment, income and foreign exchange to the country. It enables resources to be developed which otherwise non-economic

and it helps to avoid rural-urban migration. It maintains the link between people and the land. Looking at the significance of the small operations in the mining sector, it is advocated that this sector should be extended all support. Small scale mining needs to be given full recognition for its contribution to national wealth and employment and should receive proper consideration when policies and regulations are developed and implemented. A national policy on Small Scale mining may be formulated covering the following aspects.

- Establishment of a statutory definition for Small Scale Mines in India, (surface and underground operations being defined separately) using
  - rate of mineral production and overburden removal for surface workings, and production rate and depth of working for underground operations. In addition level of investment, employment, value of the minerals etc. should also be considered.
- Execution of elaborate human resource development programme to develop awareness in this sector regarding –
  - safety and health
  - appropriate technology
  - environment, and
  - statutes
- Improvement of the statutory monitoring to ensure safe and scientific mining
- Provision of financial assistance to small mines for adoption of environment control measures
- Provision of technical support in exploration, planning and quality control

## 2.7 *Community issues*

### Community and land

#### *Background*

After independence, the country embarked upon development based on large projects and by industries which required widespread displacement of population. A conservative estimate of the number of people displaced due to planned development from 1950 to 1991 is about 21.3 million on account of construction of dams, mining projects, wildlife sanctuaries and industries. More than 40% of the displaced population was tribal. In the mining sector the persons displaced is estimated at 2.5 million of which more than 50% were tribals. Only about 25% of these have been rehabilitated (NCAS: Issue No.3, 1999). This gave an idea of the magnitude of the land acquisition problem in mining areas.

The land is acquired under the Land Acquisition Act 1894 and also for coalmines under the Coal Bearing Areas (Acquisition & Development) Act, 1956. The Land Acquisition Act was first passed in 1894 by the British to acquire land for 'Public works' such as making roads, rail roads, salt mines etc. The Act was silent on the issue of rehabilitation of displaced people and communities. The process of land acquisition accelerated after the formulation and implementation of first Five Year Plan in 1951. Large tracts of land were acquired for public sector and defence projects. The involuntarily displaced persons were given meagre compensation and were left to find out ways for their rehabilitation.

The Act was amended substantially in 1984 to 'streamline the process of acquisition'. The salient features of 1984 Land Acquisition Act are:

- Land can be acquired by the Government for the private sector.
- A time limit of three years, between the first notification under Section 4.1 and the issue of the declaration of intended acquisition under Section 6. No such limit existed till then.
- It also set the time limit within which the Collector must make his award.
- The Urgency Clause (Section 17) was introduced to enable the State to dispense with Section 5 (A) under which the affected party can file objections to the proposed acquisition.

But the Land Acquisition Act gave very little scope to the affected party to challenge the process of acquisition or even to demand fair compensation and rehabilitation (Dhagumwar 1997). People's impoverishment and marginalisation were its consequences (NCAS).

India has a total geographical area of 329 million ha (reporting area is 305 mha). The land use statistics for 1990-91 is as follows:

Forests	68
Area not available for cultivation	41
Other uncultivated land	31
Fallow land	23
Net copper area	142
Total	305

The area covered by mining leases for non-coal mines is about 0.7 million ha and for coal it is estimated at 0.36 mha. Hence the total area under mining lease



is slightly over 1 million ha which is about 0.3% of the total land area in the country.

### *Rehabilitation and resettlement of displaced population*

The Central Government does not have any rehabilitation and resettlement policy. However, some State Governments and other agencies (public sector) formulated rehabilitation policies. The Governments of Maharashtra, Madhya Pradesh and Karnataka have enacted laws for the rehabilitation and resettlement of project affected persons.

In 1994 the Government of India formulated the draft National Policy for development induced Displacement and Rehabilitation of persons displaced as a consequence of acquisition of land. It was mentioned in the introduction to the draft that, with the advent of the New Economic Policy, it was expected that there will be more demand for land leading to more displacement. It was, therefore, necessary to formulate a proper rehabilitation policy. This draft was widely discussed amongst the voluntary organizations and a citizens' draft was formulated as an alternative. (Fernandes Walter and Paranjpe Vijay (Eds), *Rehabilitation Policy and Law in India: A right to Livelihood*, Indian Social Institute, New Delhi and Econet, Pune, 1997). However, since the Government did not present the R&R policy statement to the Parliament, the debate was not pursued.

In 1998, the Ministry of Rural Development prepared a draft 'Land Acquisition (Amendment) Bill'. It was learnt that the Union Cabinet approved the LA (Amendment) Bill, but deferred the draft of the National Rehabilitation and Resettlement Policy for Displaced Persons prepared in 1994.

This move by the government was stalled by people's organisations, social activists, lawyers and concerned citizens who made hue and cry about the bill. As a result, the Ministry of rural Development was forced to convene a meeting of the experts, activists working with the displaced people and government officials on 21<sup>st</sup> January 1999. In the meeting the concept of eminent domain (the right of the State to its property is absolute) and public purpose (includes industrial estates, private national and multinational corporations) were challenged. The issue of peoples rights (fishing rights, water rights etc.), their participation and proper rehabilitation were discussed. The ministry agreed to the suggestion of preparation of an alternate draft amendment and policy statement by voluntary organisations.

*The land Acquisition, Rehabilitation and Resettlement Bill, 2000 (prepared by voluntary organisations)*

Various consultations and meetings were held in different parts of the country by people's organisations, and an alternate draft called 'The Land Acquisition, Rehabilitation and Resettlement Bill, 2000' was prepared collectively by integrating both the Land Acquisition Bill and the R&R Policy. Salient features of the draft bill prepared by voluntary organisations are as follows:

- The process of land acquisition is made justifiable by including provisions for rehabilitation and resettlement in the draft;
- The doctrine of eminent domain is replaced by Principle of Tursteeship where government is a trustee of the property and has a moral and legal responsibility to justify that the acquisition is for the welfare of the people;
- The concept of public purpose has been defined where acquisition of land for private companies that work for profit can not be public purpose;
- The term 'project affected person' is defined to include displaced persons, partially displaced persons and other affected persons deprived of livelihood resources (rural artisans, traders, collectors of non wood forest produce, etc.);
- Detailed provision about the publication of notices and notifications under different sections of the draft 6, 12, 16, 17, 25 and 51 is laid down for the benefit of the concerned persons;
- Provision is made for getting information at different stages regarding the nature of the project, cost/benefit analysis, extent of acquisition and displacement to raise objections;
- Government will approve the project only after obtaining consent of the gram sabha. The gram sabha has the right to give or withhold its consent. In case of schedules areas, by following the Panchayat (Extension to Scheduled areas) Act, the gram sabha will be deemed to be concerned even if one household from the area of the gram panchayat is affected;
- 'Adult members' includes both men and women of the household. The allotted lands to be in the joint names of the husband and wife. In any public hearing on the project related matters, 50% of the participants should be women;
- The amount of the solatium will be equal to the value of compensation awarded i.e. 100%. If persons and households are displaced for second time within a period of 30 years an additional amount of solatium will be paid;

- The state Land Acquisition and R&R Commission will monitor the implementation of the Act. The persons displaced before the commencement of this Act shall also get some relief;
- Provision for special officer for the collection of data on displacement since independence at state as well at national level;
- National Land Acquisition and R&R Commission to deal with households displaced in two or more states;
- The process of land acquisition to be completed within 18 months of the notification of the intention of acquisition. If the land is not acquired within stipulated time the notification is deemed to be invalid. If the land is to be acquired again the entire procedure will have to be repeated;
- Land acquired for specific purpose cannot be utilised for another purpose;
- Displacement shall not take place unless the compensation and solatium is paid, an alternate land is allotted, and R&R process is completed.

## Community change and transformation

### *Introduction*

In a populous country like India, the mining industry plays an important role in meeting the raw material need for industrial growth and attaining a degree of self reliance particularly in the core sector such as iron and steel, power, cement, crude refining, fertilizer and other essential commodities. The importance of mining to the development of the industrial sector is indisputable and would call for both mineral development and mining at an ever increasing rate to support the core sector. Such large scale industrial activity is bound to have adverse effects in the form of land degradation, generation of solid, liquid and gaseous pollutants, destabilisation of the eco-system and communities. In the Indian scenario in the 1970s and 1980s there was almost a total disregard and insensitivity (largely borne out of ignorance of the consequences of these neglects) to the needs for environmental protection and community welfare. In the late 1980s and 1990s, due to stringent environmental regulations and community upheavals, the concern for remedial measures were manifest in many companies (both public and private) policies which resulted in some concrete actions.

The efforts of these companies in environmental protection and welfare of its employees have been commendable. A case in point is the coal industry where, after nationalisation of the coal mines in 1971-73, the workers remuneration, welfare amenities improved considerably. Dignity of labour was established and they contributed significantly to the growth of the industry. This led to creation

of islands of prosperity in many of the mining areas like Singrauli, Kudremukh, Bailadila, Khetrs, Malanj Khand, Noamundi, etc. Local communities benefited in terms of employment, hygiene, health, education development of roads, water supply etc. The spin-off effects of mining and mineral industry were the development of ancillary small scale and cottage industries. However, there are many other companies which continue to be insensitive to the consequences of mining on environment and communities.

### *Campaign against unjust mining*

The relationship between mining companies and communities has been characterised by the fact that the local communities are seldom consulted, their needs and concerns are only marginally satisfied and they are rarely involved in the decision-making processes. The result has been a relationship in which confrontations, tensions and conflict have been predominant. Campaign against unjust mining by people's organisations and social action groups emerged as a support to the struggles of the local communities for people's right over natural resources. Issues brought out were displacement, human rights violations, environmental degradation and health hazards. The livelihood systems of Adivasi communities and rural poor are increasingly being taken away by huge mining operations in Bihar, Madhya Pradesh, Orissa, Goa, Maharashtra, Andhra Pradesh and other states. These social groups are also critical of the role of World Bank's policy in the coal sector in India. The World Bank provides technical assistance to member countries on the legal framework, geographic information systems (GIS), environmental regulation, modernisation technique etc. Paradoxically the bank is also involved in suggesting ways to mitigate the socio-economic and cultural impacts of mining. Still, all the major WB funded mining projects suffer the most from the socio economic problems. In 1997, G. Nankuri, A WB researcher states "people living closest to mines have suffered most and usually benefited least. The mineral dependent developing countries actually had slower rates of economic growth, lower level of social welfare and higher disparity between rich and poor when compared to developing countries less reliant on mining". Brief details of some of the campaigns by social action groups in Orissa, Andhra Pradesh and Bihar are described in following paragraphs and are also given in Annexure 8. A list of Non-Governmental Organisations (NGOs) working for cause of environment and social justice is given Annexure 9.

*Bauxite mining*

Large deposits of bauxite has been discovered along the East-Coast in the States of Orissa and Andhra Pradesh. NALCO is operating one of the deposits in Orissa. In addition many large private sector companies and small and medium size companies have acquired leases for vast areas of land in Rayagada, Kalahandi and Koraput districts in Orissa for bauxite mining. Most of these deposits fall in forest areas inhabited by tribals. The social action groups have started a campaign on issues related to: displacement, right to information, human rights and right to common property resources and a clean environment.

Andhra Pradesh has a huge deposit of bauxite around 700 million tonnes. To have an access to these bauxite deposits around 25 major tribals villages have to be displaced, around 10,000 trees have to be pulled out, and the state will lose around Rs. 1520 crores in terms of environmental degradation like soil erosion, etc. The local NGO, SAMATA filed a plea in the Executive Magistrate's Court at divisional level for restoration of tribals rights over land stating that no Government is above the Constitution, and thus tribals cannot be alienated in Scheduled Area as referred to in Fifth Schedule of the Indian Constitution. SAMATA also challenged laws such as the LA Act, Forest (Conservation) Act, etc. The Divisional Court and the Apex Court supported tribal rights, and after a battle of two and a half years the full bench of the Supreme Court in a Special Leave Petition, No. 17080-81 of 1995 made a historical judgement in favour of tribals. The Judgement stated:

- a) Government lands, forest lands and tribal lands in the scheduled area cannot be leased out to non tribals or private industries;
- b) Government cannot lease out lands in scheduled areas for mining operations to non tribals as it is in contradiction of the Fifth Schedule for the constitution;
- c) Mining activity in scheduled areas can be taken up only by Andhra Pradesh State Mineral Development Corporation or a co-operative of tribals and that if they are in compliance with the Forest Conservation Act and the Environment Protection Act.
- d) The court recognized the 73<sup>rd</sup> Constitutional Amendments Act and the A.P Panchayat Raj (Extension of Scheduled Areas) Act by stating that the gram sabha shall be competent to safeguard and preserve community resources and thereby reiterated the need to give the right of self governance to tribals.
- e) If necessary, the court felt the Chief Secretary of A.P state should constitute a committee consisting of himself, Secretary (Industry), Secretary (forest), Secretary (social Welfare) to have the factual information collected and

considered whether it is feasible to permit the industry to carry on mining operations. The committee consisting of Ministers for Industries, forest and Tribal welfare to examine the issue whether licenses could be allowed to continue or whether expedients to prohibit further mining operations.

- f) In case where the similar Acts in other states do not totally prohibit grant of mining lease of the lands in the Scheduled area, similar committee of secretaries and State Cabinet sub committees, should be constituted and decision taken thereafter. Before granting lease, it would be obliged for the state government to obtain concurrence of the Central Govt. by constituting a sub-committee headed by the Prime Minister and other Union Ministers.
- g) The court also felt that it would be appropriate to constitute a conference of Chief Ministers and concerned union ministers to take a policy decision so as to bring about a suitable enactment for a consistent scheme throughout the country in respect of the tribal lands and exploitation of mineral wealth.
- h) The state government was therefore, directed to stop all industries from mining operation.
- i) The court opined that since the Executive is enjoined to protect social, economical and educational interest of the tribals, when the State leases out the lands in the scheduled areas to non-tribals or industries for exploitation of mineral resources, it transmits the corrective above Constitutional duties and obligation to them only. Hence The court direct that at least 30% of the net profits should be set apart as a permanent fund as part of the industrial/business activity for establishment and maintenance of water resources, school, hospitals, sanitation and transport facilities by laying roads, etc. This 20% allocation would not include the expenditure for reforestation and maintenance of ecology.

#### *Jaduguda Mine, Bihar*

The Jaduguda uranium deposit is located in the Singhbhum thrust belt, a mineral-rich geological zone which has seen extensive mining since the days of British occupation. It is reported that 26 minerals are currently being mined in the Singhbhum district alone, including iron ore, copper, manganese, bauxite and uranium. The Jaduguda mine is situated in a heavily forested area of steep hills which form a fertile river valley. This is part of the catchment of the Subarnarekha River, which flows through the states of Bihar, Orissa, West Bengal. The uranium deposit is operated by the Uranium Corporation of India Limited (A Government of India undertaking). It is an underground mine and

the ore is processed to produce 200 T of uranium/year in the form of an yellow cake.

The waste, material (tailings) is treated with lime to neutralise the acidity, and then separated into coarse and fine particles. The coarse tailings, making up to about 50% of the volume of the waste, are backfilled into the mine cavities. The remaining waste material is dumped in 3 large tailing ponds.

The Jharkhandi Organisation against Radiation (JOAR) is an indigenous people's organisation set up in 1991/92 to pressurise UCIL management to reform its operations. JOAR is pursuing five demands in relation to Jaduguda:

1. Bringing radioactive wastes from other sites in the country and dumping them in their villages should stop forthwith.
2. International norms and standards for storing radioactive waste that has already been dumped should be meticulously observed
3. All the villages around the already existing tailing ponds should be resettled at a safe distance and complete rehabilitation should be undertaken.
4. All the families whose active working members have either died or been incapacitated and the families which have children with serious physical and/or mental disabilities should be adequately compensated and the company should take the responsibility for their treatment.
5. The company should set up a public dispensary manned by medical personnel qualified to treat radiation related diseases, and its functioning should be under the direction of the traditional Adivasi leadership of the Majhi/Pargana.

#### *Coal Sector – Environmental and Social Mitigation Project (CSESMP)*

In 1991 CIL applied for a loan to World Bank to modernise its mines. The bank had already been charged with negligence in rehabilitation of displaced people at Singrauli. Therefore in August 1995 an NGO/World Bank meeting was held to encourage greater interchange of information and experience so that better mediation could take place. In the same year, the bank management was made to realize that the social and the environmental risks of the proposed loan were of a magnitude that could be dealt with/by a free-standing project. This led to sanctioning of a separate project known as Coal Sector Environmental and Social Mitigation Project (CSESMP) and this was to begin prior to the proposed Coal Sector Rehabilitation Project (CSR). In all 24 opencast projects were selected for the CSR and the ESMP programme was launched in the 24 mines.

The major components of 'Environmental and Social Mitigation Project' were:

- Capacity building of CIL to reduce the social and environmental issues of coal mining operation.
- Investment support for implementation of environmental action plan (EAPs), rehabilitation action plan (RAPs) and indigenous people development plan (IPDPs) with NGO and community participation
- A social remedial action for the earlier four coal mines which received loan support from World Bank.

The sanctioning of ESMP loan by World Bank was questioned by social action groups like Chotanagpur Adivasi Sewa Simiti (CASS) a part of the JJM. The report dated April 20, 1996, by CASS on effects of coal mining at East Parez mines (Hazaribagh), questioned the very validity of the claims made by CIL. But on May 16, 1996, the bank approved the loan with a condition that successful implementation of ESMP will lead to sanctioning of CSR. After a year or so, the World Bank sanctioned the main loan for CSR.

The issues:

The major issue of 'Displacement' and 'rehabilitation' was not adequately addressed by Coal India. CIL was not compensating for displacement with 'land for land' or 'job for land'. The alternative income generation program in the rehabilitation package was insufficient to meet the needs of affected people. The cost benefit analysis was not given the due consideration. The concerned people organizations identified 18 issues related to unjust mining and sent it to the bank. It was termed as a Bench Mark and some of the aspects were as follows:

- All relevant information related to social and environmental issue should be made public.
- All land held by project affects population (PAPs) should be compensated adequately
- Total economic rehabilitation should be considered
- Consultation and participation of PAPs should be primary objective
- An independent panel of experts to review and monitor the social and environmental issues should be created
- Rehabilitation should happen prior to displacement.

The ESMP was to be the future model on rehabilitation and a paradigm of bank concern for social and environmental issues but the focus remained diffused because the major national NGO networks were occupied in campaigns of



interrelated issues on several developments in the mining sector in other areas of the country.

*Community consultations and involvement in mining areas: Case studies*

A number of companies have taken up community development work in the mining areas in consultations with the communities. A few case studies are discussed below:

*Bailadila complex, NMDC*

The major iron ore projects are located in Bailadila, a 36 KMs long and 10 kms wide hill-range in the Bastar region of Madhya Pradesh. The area is characterised by rugged terrain and hills with thick deciduous forest with heavy rainfall. The area houses a large variety of tribal sects. The area, prior to the establishment of the projects, was totally cut off from the rest of the country and was devoid of any basic amenities as well as infrastructure facilities. The people were illiterate.

NMDC has embarked upon certain community development experiments, which were later crystallised, into concrete action programmes. As a preliminary step, projects started extending free medical facilities to the local tribals. The project doctors with para-medical staff and medicines were regularly deputed to visit the interior villages to provide necessary medicare at the door steps of the tribals, then the project concentrated on providing potable drinking water by constructing tubewells as well as traditional open wells.

The Bailadila Project contributed in bringing about a metamorphosis in the attitudes/thinking of the tribals in favour of non-agricultural employment. As a result, the percentage of tribal employees in the total work force of the Projects is substantially higher than what the Govt. has prescribed. However, in order to ensure that the fruits of development are evenly distributed, NMDC has initiated a regular consultative process on the one hand with the local village-heads as well as Panchayat leaders and on the other hand with the Unions and Associations functioning in the project. Periodical meetings are held with the Sarpanches of various tribal villages adjoining the projects and tentative lists of the developmental works to be undertaken are detailed. After examination of the various requirements, the works are segregated under the following major heads:

1. Medical facilities
2. Education
3. Drinking water

4. Infrastructure facilities like laying of roads, construction of bridges, fair price shops, electrification of village etc.
5. Miscellaneous

Details of community development works done

1. Medicare: Free medical aid in all respects (both out-patient and in-patient), including family welfare counselling and operations including free diet is being provided to the scheduled tribes (Adivasis) residing within Dantewada Tehsil in Project hospital. Ambulance(s) /hospital equipment were procured and handed over to the district administration for use in providing medicare in interior villages. Construction as well as renovation/repairing of PHCs including provision of infrastructure construction of veterinary hospital with attached residential accommodation to the doctor were also undertaken.
2. Education: Free educational facilities for children of tribals (local adivasis) and scheduled caste students in project schools are provided. Besides constructing a number of school buildings, additional class rooms, ashrams and hostels, NDMC is regularly undertaking repair/renovation works to a number of school buildings of State Government and other Tribal schools in the vicinity of its Projects including electrification works.
3. Drinking water: Number of hand pumps/water tanks/open wells/tube wells have been constructed for supplying drinking water to the nearby villages. NDMC has also undertaken: construction of overhead tanks in various areas for the benefit of local peoples.
4. Infrastructure facilities: Following infrastructure development works have been done:
  - Roads: All-weather roads to a number of villages connecting one village and another WBM roads from village to village, town to town, para to para etc. construction/improvement of approach roads to various villages – black topping of PWD roads – repairs to state highway over a stretch of 25 kms.
  - Electrification works in the peripheral villages and provision of streetlights.
  - Provision of steel walkway bridge over Madadi nallah.
5. Afforestation: Further the extensive tree plantation programmes in which over 18 lakh trees have been planted in and around various locations of the

Bailadila Projects, the local Adivasis are encouraged to grow saplings in their agricultural land so that these are purchased resulting in monetary benefit to them. The projects also provide necessary technical guidance, seeds, manures, etc. Over the years, the Bailadila Projects have awarded contracts providing employment opportunities to Adivasis for tree plantation in the Bailadila area to protect the environment. Up to 1998-99, the Bailadila Projects had spent around Rs.1360 lakhs on Community Development works.

*Sustainable land management in Kolsoi village in Goa – by Sesa Goa Limited*

In the Kolsoi village (a village close to iron ore mines), the villagers used to cultivate paddy during 'Rabi Season'. The run-off from the waste dumps in the surrounding mines was getting deposited in the low-lying paddy field. The silt accumulation changed the physio chemical and microbiological properties of the soil, which resulted in poor crop growth and lower yields. The company used to pay annual compensation to the farmers for loss of crop and removal of silt from the fields. As the years passed, the tendency of farmers was to obtain compensation rather than actually cultivating the land. The practice is prevalent in many mine areas in Goa. Sesa Goa Authorities decided to tackle the problem by eliminating the cause of silting and also restore the productivity of the land. The dump run-off was diverted through a new channel to divert the monsoon runoff. The trench was wide and had laterite retention walls across, so that water could be filtered and silt arrested. 1 kilometre length was constructed at a cost of Rs.2 million. During monsoon, overflow water was monitored to maintain the total solid suspended solids at the outlet at less than 25 mg/litre. After controlling the silt, the restoration of agricultural fields was taken up with community participation.

Community participation is most vital for success of the programme and therefore villagers suggestions were considered. Agricultural department of Government of Goa was associated for technical advice and to suggest method for restoring productivity of the soil. Detail investigation in the farm practices and soil analysis revealed that:

- a) Soil is deficient in potassium and phosphorous.
- b) Over the years farmers received the money for silt removal for whatever silt accumulated but did not remove properly. This has caused accumulation of silt and change of soil structure thus leading to compaction.
- c) There was degeneration in seed material used, which also affected crop growth.

d) Awareness regarding pest management was very poor.

Accordingly, awareness and training programme for farmers were conducted (with help of Agriculture department of the Government of Goa and NGO's) to educate them on proper farm practices to suit the local conditions.

Project detail:

1. Village - Kolsoi
  2. Area - 8 Ha
  3. Number of Families - 40
  4. Provided certified seeds to all farmers.
  5. For better mixing of soil, power tiller was provided replacing bullock ploughing which was very shallow.
  6. Organic manure and potash supplied to all the farmers for enhancing nutrient status of soil.
  7. Pesticide pump donated to the farmers association and constant follow up for advising on pesticide spray.
  8. Applied lime for correcting PH
- With these inputs Physiochemical characteristics of soil improved.

The project was a grand success and farmers harvested a bumper paddy crops. The project established that paddy fields could be restored back to normal. The involvement of villagers, Govt Agency, local population and their education and satisfaction was the real gain for Sesa Goa.

Integrated bio-technological approach for mine land reclamation:

The objective of this approach is two fold i.e. prevention of heavy metal leachates from dump and rejuvenation of productivity by vegetation of dump with organic waste and biofertilizer. In this approach mine dumps are evaluated for physical, chemical and biological characteristics. Based on field studies, heavy metal protocol is developed to achieve separation of different metals from mixed pollutants. Various blends of organic waste, mine spoil and biofertilizer are evaluated for build up of nutritive and supportive capacities. All these studies are carried out in laboratory and green house. Based on above studies 8000 saplings of 21 varieties are planted on five hectares of rejection dump. Grass species-“Congo” is introduced for ground cover. Saplings before planting are treated with Nitrogen fixing bacteria, Rhizobium and Azaetobacter. Later,

“Mycorrhizae” is introduced in rhizosphere. The performance of planting is being monitored regularly.

This project is a collaborative research work in association with National Environmental Engineering Research Institute (NEERI) Nagpur, Department of Biotechnology and Lund University, Sweden.

The results of above project are very encouraging.

#### *Indigenous people’s development programme in ESMP projects of WCL*

This programme has been taken up in 22 villages surrounding the five mining projects with a population of more than 35000 people. The following activities have been carried out by WCL.

- **Skill development:** Under this plan skill development training in Goatary, Poultry, Bee keeping, Tailoring, Stationery making, Pump repairing, Basic electrician etc. have been imparted to nearly 350 unemployed youths from the community.
- Community awareness activities
- **Infrastructure development:** Which includes - Construction repairing of internal roads, drains, tube wells/hand pumps/ cleaning of old deep wells, library rooms, community hall, Installation of overhead tanks etc. All these activities are undertaken by the village working groups and no contractors are employed in the job. A major share of the funding is provided by the coal company.
- **Formation of self help groups (SHGs):** More than 75 SHGs have been formed in the villages for developing tailoring skills among the village women, fishery projects, goatery units etc. for income generation.

## **2.8 Environmental effects of mining**

The impact of mining activities on pollution of air, water, land, soil quality, vegetation including forest ecosystems, and on human health and habitation has become a matter of serious concern. Any deterioration in the physical, chemical, and biological quality of the environment affects human health and flora and fauna. The health problem of miners arising out of on-site pollution due to dust, gases, noise, polluted water, etc. is receiving increasing attention. Some of the negative impacts on the landscape and the human environment, can effectively be permanent. While some segments of the minerals industries, governments and others are much more conscious of these issues, effective sector-wide management of these problems is neither universal nor adequate.

The magnitude and significance of impact on environment due to mining varies from mineral to mineral and also on the potential of the surrounding environment to absorb the negative effects of mining, geographical disposition of mineral deposits and size of mining operations. A list of minerals has been prepared by Department of Environment, the mining of which is supposed to have serious impact on environment. These minerals include coal, iron ore, zinc, lead, copper, gold, pyrite, manganese, bauxite, chromite, dolomite, limestone, apatite and rockphosphate, fireclay, silica sand, kaolin, barytes, steatite. Mineral production generates enormous quantities of waste/ overburden and tailings / slimes which are indicated in the following table in respect of some minerals. These details have been worked out with the help of actual production figures and the projections made in respect of overburden/waste and tailings/slimes. Though the Table 14 given below is not exhaustive, nevertheless it gives some idea about the quantities of mineral and waste material to be handled. Actual data are not available on the extent of land occupied by mining operations including waste disposal sites. It is however, estimated that about 10,000 ha of land was affected in 1999/2000.

**Table 14** Mineral production, waste generation and land affected in 1999-2000

S. No.	Mineral	Production (MT)	Overburden/Waste (MT)	Tailings/ slimes (MT)	Estimated land affected (ha.)	Norms used (land in ha/MT of coal ore ore)
1	Coal	300	1100	5	7500	25
2	Limestone	129	135	1.06	1300	10
3	Bauxite	7.1	4.3	3.5	700	10
4	Iron ore	75	69.9	23.8	700	10
5	Copper ore	3.1	3.6	1.4	--	--
6	Lead-Zinc ore	2.8	4.1	2.6	--	--
7	Manganese ore	1.6	6.8	--	160	10

The total area of mining lease with active mining operations is the minimum area which is being affected by waste generation. However, the actual off-site area affected by pollution and degradation by the accumulation of waste material will be far more than the area of the lease in which the operations are in progress. It is also possible that a number of mines may exist in a close cluster adding to the adverse effects. Accumulation of tailings and red mud will add to the seriousness of the environmental adverse effects.

In addition, there are a very large number of abandoned mines and mining sites for which detailed information is not available. However, for the coal sector, it is reported that there are more than 500 abandoned mines in Jharia

and Raniganj coalfields in Bihar and West Bengal respectively occupying more than 10,000 ha of land. In addition, overburden and spoil dumps occupy large area of land. A large number of fires have also degraded large areas (2330 ha) in these coalfields. Presently, there is no specific legislation in India, which covers the requirements for environmental protection during the closure of a mine. However, MoEF, while giving environmental clearance for a project may specify/approve plans for reclamation work to be carried out on closure of mines as indicated in the EIA/EMP of the project. Recently MoEF has introduced a system of demanding a closure plan from the mine operators, which should be submitted 5 years before actual closure of mining operations.

## Environmental impact of mining of some important minerals

### *Limestone*

Indian limestone in general is high in silica and magnesia, therefore almost equal quantity of waste and overburden is generated due to mining of this mineral. Limestone mines can be categorized as shallow operations and generally are confined to 40-50 m depth. It is seen that as a matter of practice one or two small pits are kept as reservoir for water for processing plants and also for domestic consumption and plantation. This is on account of the fact that there is general scarcity of water in limestone areas. However, the management of these mines is instructed to fill back the abandoned pits at least up to one-third part of the mined out areas by the overburden and waste being generated currently.

The environmental problem in Dehradun-Mussoorie Belt in the Himalayan Region was acute as the area is a place of tourist interest on one hand and the limestone is of high grade for steel making on the other. There was a time when the production of limestone from this area was 1.5 million tonnes per annum which used to be contributed by 50-60 small mines and medium mines. The unscientific mining left ugly scars on the sides of the hills, which came to invite severe flak of communities, media and environmentalists. Public litigation was filed in the Supreme Court, which gave a ruling to close all mines in the area. Rehabilitation work has been undertaken in right earnestness, and monitoring system has been introduced. A number of successful rehabilitation of the mining areas in the region was carried out the Forest Research Institute (Dehradun, India).

The high grade limestone mining in Jaisalmer, which produces about one million tonnes per year for steel plants is following an elaborate environmental

management plan to restrict the advancing desert in the form of sand dunes by planting trees as advised by the Central Arid Zone Research Institute, Jodhpur.

Mining of calcareous sands in the inter-tidal zone of Gujarat coast in the Arabian sea near Sikka has been completely banned as this area also bears corals. The area has been declared as a marine sanctuary. The company has since located alternative source of limestone for its cement plant.

### *Iron ore*

Iron ore being produced in Singhbhum-Keonjhar, Bellary-Hospet, Baidadila and Dalli-Rajehra regions does not have much of overburden except for some laterite, and low grade ferruginous shales. Washing plants were required to be installed in these locations to improve the quality of ROM. The slime generation as a result of washing is around 15-20 per cent. In Kudremukh, however, the slime rejection is as high as 66 per cent of the ore produced. The slimes are impounded in a tailing pond on a large area in a forest. Water treated for improving its quality before it is discharged in to river. However, it is seen that the rivers such as Karo and Baitarni in Bihar and Orissa, Indravati and Sukarni in Madhya Pradesh and Tungbhadra and Bhadra rivers in Karnataka are somewhat polluted due to wash offs from mining operations. Construction of garland drains, check dams, contour drainage and plantation, etc. has been resorted to in an attempt to check the flow of fines and slimes to water courses and agricultural land. The condition is different in Goa. Here the overburden is sizeable. Against annual production of about 15 million tonnes of iron ore, about 40 million tonnes of overburden and waste material is generated. Added to this, there is an acute shortage of land for dumping purpose.

### *Bauxite*

Several bauxite mines are located on hilltops at altitude exceeding 1000 m. Here the land is barren having only grass. However, the slopes of the hill are having trees. In Bihar, Orissa and Madhya Pradesh, the overburden cover may be 3-5 m. The mine at Panchpatmali, NALCO is the largest mine. Its present annual capacity is 2.4 million tonnes which is under expansion to double the production. A barrier of 15 m width round the deposit has been provided to prevent the fines and waste material from rolling down the hills. Worked out areas of the mine are backfilled and are rehabilitated by suitable plantation.

However, the main pollution consequent to bauxite mining is because of red mud which is obtained on conversion of bauxite in to red mud. The quantity of red mud generation is as much as 50 per cent of the quantity of bauxite treated.



The red mud is generally confined by making barrier/dams in low-lying areas and water is recirculated to the process plant. Red mud is also being used in making bricks for civil purposes. R&D work is under progress for its various other uses. The high quality bauxite of chemical and refractory grades located in Gajarat and Kutch occur in plane land with 1-3 m overburden. After mining for about 3 m, the pits are backfilled and the land is reclaimed.

#### *Copper, lead and zinc*

In the initial stage, copper and lead-zinc mines were underground mines except Chandmari of Hindustan Copper Ltd. During 80's, mines at Malanjkhand and Rampura-Agucha were started in open pits in Madhya Pradesh and Rajasthan. There is not much of environmental problem due to underground mining, as the mining methods do not cause any subsidence. Acidic mine water is treated wherever necessary before it is used. Deslimed tailings by hydrocyclones are utilised in backfilling of worked out stopes. Slimes are stored in tailing ponds. In Singhbhum area, tailing ponds could not be provided as there were problems in acquiring land in tribal areas.

#### *Chromite*

Chromite mostly comes from open cast operations. There are three underground mines besides the open pits. The ratio of ore to overburden is as high as 8-10 in opencast mines. In Sukinda valley in Orissa, about 30 million tonnes of overburden material has already been dumped in the vicinity of various mines. This overburden material contains approximately 0.5-0.6 per cent nickel and 0.1 per cent cobalt. Efforts are on to ascertain the feasibility of recovering these metals. Another problem is in working the deposits in this area by underground methods, as the wall-rocks are extremely soft. Therefore, the present alternative appears to be to continue the open pit mining to as great a depth as feasible. It is seen that a few mines have already gone below the water table and therefore pumping operations have become a little too expensive. There is no contamination of heavy metal in mine water except hexavalent chromium.

#### *Other minerals*

Mines of gypsum, china clay, ball clay and chalk are small and shallow and may not exceed a depth of 10-15 m. Pits are generally worked in a sequence and when one pit is exhausted an adjacent is opened. The waste material is filled in the finished pit and land is reclaimed. A large number of mica mines are worked in

Bihar, Rajasthan and Andhra Pradesh. The operations are underground by small workings and therefore, there is no surface damage because of these operations.

### A few case studies

#### *National Mineral Development Corporation (NMDC)*

NMDC is operating three highly mechanized iron ore mines, two in Bailadila region, Chattisgarh state and one at Donimalai in the Bellary-Hospet sector of Karnataka state producing high grade iron ore of +65% iron content with annual production of 16 Million Tonnes. All these mines are ISO 9002 accredited. The only organized Diamond mining operation in India is being done by NMDC at its Majhgawan Diamond Mining Project in Panna district of Madhya Pradesh state which is at present producing 60,000 carats and is likely to reach production of around 1,00,000 carats per year in the next tow years.

In its iron ore mining operations, NMDC has been using wet circuit beneficiation arrangement, which leads to production of poorer grade tailings. These tailings have been properly stored on number of tailing dams for environmental reasons. However, the space for future tailing dam being limited, permanent solution was to be found for avoiding water pollution problems which could be caused due to flowing of these tailings if not stored properly. NMDC has taken a decision to utilize the latest "ROMELT PROCESS" of steel making which would be able to consume the tailings (low grade iron ore). The steel plant with a capacity of 3.0 lakh tonnes per year is being planned and would be the first commercial plant with the technology.

As a part of its research, NMDC possesses a state of the art R&D Laboratory at Hyderabad basically established to develop new value added products from mine and other wastes. Development of soft grade ferrite powder used for manufacture of components for television, pigment grade ferric oxide for the Paint industry are some of the innovations made by NMDC R&D centre, from the waste blue dust of Bailadila region. The 6,000 tonnes per annum Ultra Pure Ferric oxide plant shortly to be commissioned at Visakhapatnam in AP state is one of the value-added products developed at our R&D centre from the "blue dust" of Bailadila region.

Water management practices in NMDC projects: A Regional environmental management plan has been drawn for Bailadila iron ore mines complex which includes "Integrated water management". There are a few perennial streams in the region for which lean and peak discharges are being monitored regularly. Based on the actual water requirement of the project, water source is identified, suitable intake wells have been created and pumped to various destinations

including townships. One of the key aspects considered here is that a minimum of 40% of water is left in every perennial stream for downstream villages and also not to create impact on the aquatic eco-system along these streams.

At Panna diamond mining project, an artificial reservoir over Kaimason nala is created for storage of water and use at the mine/plant/township areas.

Similarly, for use of water at Donimalai project, water is tapped from artificially made Narihalla reservoir over Narihalla stream.

Wet screening of ore in order to remove attached/ adhered gangue material demands maximum share of water for any iron ore production project. The requirement of water for wet screening operations is about 0.85 cum/tonne of ore. For better recovery of fine ore, slow speed classifiers are used. Thus only a small amount of iron ore microfines along with shaly material is let out to the tailings dam. Due to this process the life of the tailings dam has increased. The supernatant water from tailings dam is recycled back to screening plant and the make up fresh water requirement is only 30%.

Several check dams have been constructed at strategic points so as to reduce velocity of water flow and help in arresting silt loads flowing down the slopes. Construction of buttress walls all along the toe of waste rock dumps, chain linked boulder mesh walls around the toe of old fine ore dumps, trench cutting and provision of garland / storm water drainage network, provision of steel launders for properly routing mine drainage, mechanized and manual desilting of tailing dams and check dams have proved very effective in controlling surface water pollution in and around active mining areas.

#### *Bailadila iron ore mines*

The area comprises a hill range 40 km length and 10 m width with highest peak going up to 1,276 m above MSL and planes rising 300-400 m with hillocks up to 600 m MSL. There are 14 iron ore deposits here out of which deposits 14, 11C and 5 are under mining at present. Deposits 11B and 10/11A are also being planned for mining. The entire area is in a forest, which is of southern tropical dry deciduous type mostly with certain patches of northern tropical dry deciduous type. The forest is wide spread and is fed with good rain- falls and has rich flora and fauna. The hill-tops are barren because of outcrops. The area of the different mining leases are being used for pit excavation, approach roads, haul roads, waste dumping, construction of ore processing and loading plant, stock piles, tailing dams, functional and residential housing. About 400 hect. out of the ML area of 954 hect. of Deposit 14, and 459 hect. out of ML of 672 hect. of Deposit 5 have been utilized as above. These areas were barren hilltops

and the dense forest area has not been affected excepted for small parts which were covered by waste debris flown down under gravity.

Interpretation of satellite data generated during 1985 and 1991 indicates that dense forest remained the same at 12.5 per cent, degraded area decreased from 17.6 to 14.3 per cent, land use due to mining and other activities increased from 2.2 to 3.8 per cent, crop land increased from 3.9 to 5.1 per cent and built up area remained same at 0.8 per cent. A small area spoilt by dumping has been compensated by afforestation. The new mines coming up (which have ML of 391 and 75 hec.) will be in barren land on the hilltop.

For disposal of waste dump, sites were selected carefully with consideration of topography in mind in order to restrict the flow of materials in to the natural watercourse. Areas where closed valleys and/ or blind angles exist are proposed with rock toes. For environmental friendly disposal of waste, fast growing trees were planted on flat top and inwards sloping areas with construction of small terraces. The reclamation of Deposit -14 has also been taken up with the support of the data collected over the last 20 years, it can be stated that there is practically no climatic change in the area except for the cyclic heavy rain every 4 to 5 years.

#### *Reclamation of an abandoned mine site in Goa by Sesa Goa Limited*

The Sanquelim mine is situated at Sanquelim, North Goa and is spread over an area of 200 Ha. The mining operations started in 1960 and the mine was exhausted in 1988. A more detailed and scientific land reclamation strategy was adopted in this mine.

The experience of rehabilitation of Orosso Dongor mine was utilized at Sanquelim for covering clay with laterite terrace and construction of chek, dams settling ponds and planting Acacia and cashew. In addition to steps explained earlier, "Pot Culture" experiment was conducted with the objective to identify plant species that can tolerate inhospitable condition of mine sites and grow without artificial aid such as fertilizer and irrigation. In the pot culture experiment different local species were planted on the dump in the dry season. A earthen pot was buried adjacent to the plant and filled at regular interval. Though seepage plant would get regular supply of water. After six months 90% survival was observed indicating, moisture was main inhibiting factor for plant growth. The results revealed that, local flora can grow on mine rejects if the soil is supplemented with organic matter in the form of Neem cake, Organic manure "Myceameal" etc. These findings were used to make plantation programme

more scientific and to introduce local flora thus improving the biodiversity of reclaimed area.

#### *Malanjkhand copper mine*

Malanjkhand mine of HCL produces 2 million tonnes copper ore per year. Here, the overburden is 4 to 7.5 m<sup>3</sup> per tonne of ore. A matching beneficiation plant and tailing disposal system and water reclamation plant supports the operations. A 5 km long green belt around the industrial area has been generated. As the quantity of overburden is large, a height of 60m has been designed for dumps. The tailing dam would also have an ultimate height of 47 m. Another dump has been created for lean grade sulphide and oxide ores. R&D work on recovery of copper by acid leaching of oxide ore and bio-leaching of sulphide ore has also been done. The stockpile for the lean ore is so located that it does not pollute storm water drainage and ground water. Waste dump is sufficiently flat to control encroachment of adjoining paddy fields. A garland drain has been provided at the outer side of the waste dump to provide further protection to the agriculture land. The mine is under expansion to an annual capacity of 3 million tonnes of ore. The final backfilling will be decided only after the expansion. An underground mine may also be opened to be operated along with the expanded opencast mine. This will enable the management to have a matching smelter at the project.

Handling a total amount of fine siliceous tailings at 5,800 tpd is a little problematic though copper, iron, sulphur, aluminium, calcium, magnesium and cobalt are in limited quantity. The tailings are carried to a confined isolated place, 14 km away in a 250 mm diameter pipeline. The water is collected after desilting for pumping, back to the project for recirculation. A second dam has also been provided downstream to take care of spillage of tailings during the monsoon.

#### *Central India manganese ore mines*

Manganese Ore (India) Ltd. which operates these mines adopted an Integrated Biotechnological Approach (IBA) which can be defined as a systematic procedure for scientific reclamation of mine spoil dumps. The work was carried out in association with National Environmental Engineering Research Institute, Nagpur. The method involves co-recycling of mine spoil with sugar mill waste as press mud. The organic waste provides suitable substance for proliferation of soil microflora. It involves inoculation of plants with specialized culture. The microorganism secretes hormones, which help to improve plant establishment

and growth. Ecological cycles in rhizosphere are restored just in 18-20 months, which otherwise takes decades. IBA helps in assisting the establishment of trees such as mango, sapota and pomegranate.

When the press mud was mixed with mine waste at the rate of 100 t / hect., it improved the water holding capacity to 33.95 from 10.6 per cent., spoil organic matter also improved from 0.249 to 1.58 per cent. Nitrogen content improved from 16.9 mg/100 g of spoil to 180 mg/ 100 g. The use of press mud improved the rate of plant growth 8 to 12 times the rate seen in normal spoil dumps. Plant survival went up from 15 to 87 per cent.

*Mining operations by surface miner – Gujarat Ambuja Cements Limited (GACL)*

GACL since inception has been endeavouring to adopt stringent measures for environmental protection and maintenance of ecological balance in all its activities including mining operations. GACL is operating three captive open cast mines and exploiting limestone and marl. The total production of limestone and marl are of the order of 5.15 and 1.85 MTPA respectively to meet raw material requirement of 3 plants located at Ambujanagar in Lodinar, Gujarat. Captive mines are located at Vadnagar and Rampara villages.

The management of the GACL has been making continuous efforts towards eco-friendly and environmentally safe methods of exploitation of raw material having been beset with the situation of operating limestone deposit located scatteredly interspersed with agricultural fields, infrastructure, villages and habitation. These continuous efforts led to deployment of State-of-the-art mining equipment, which was introduced on 15<sup>th</sup> February 1995. This eco-friendly machine facilitates operation in close proximity to agricultural fields and as well to human dwellings. The successful trials of Surface Miner made the company to change over from the conventional methods of mining operations, thereby totally eliminating drilling and blasting as well as ripping and dozing w.e.f March 1998. Today the company is a proud owner of five Surface Miners having capacity to produce 4000 to 4500 TPD of limestone each. The entire raw material requirement is met through Surface Miners.

The equipment provides advantages over conventional mining operations such as:

- Total elimination of drilling and blasting
- Operations are eco-friendly and environmentally safe without any hazards

- Absence of ground vibrations, noise air blast, dust and oversized boulders which are usual with conventional method of mining
- Highly simplified operations of breaking, crushing and loading limestone into tippers/dumpers in one single operation
- Production and effective control over, the size of excavated material does not warrant further crushing and can be fed directly
- Floor of the worked out mines render uniform, clean and even without any undulation. Topography of the worked out mine is very neat and clean as against indelible scars left over by conventional methods
- The machine meets the norms prescribed under EURO II standards for automobile emissions

The surface created by Surface Miner is clean, level without any undulation. These mined out areas could be used for developing artificial ponds to promote Pisciculture or it could be even used for agricultural purposes after due rehabilitation through topsoil management. Mining activity in this area has resulted in creation of large size pits in the lease areas over a period of time. Out of the available excavated area of 152.0 ha. after exhausting the mineral at Vadnagar mine, an area of 75 ha has been brought under post mining reclamation programme. Similarly at Solaj 5 ha of area has been brought under reclamation. This accounts for 55% of area under better landuse after the exploitation. The following statistics illustrates various reclamation efforts.

<b>Type of reclamation</b>	<b>Area (ha)</b>
Area under Civil Construction	13.00
Area under green belt	5.15
Area under plantation	38.85
Area under water body	15.00
Area under pasture land	3.00
<b>Total</b>	<b>75.00</b>

*Panchpatmali bauxite mine of National Aluminium Company (NALCO)*  
 NALCO a Public Sector Company setup in 1981 to exploit a part of the large bauxite deposits discovered in the East Coast. Aluminium Pechiney of France a major World leader in this field, provided the technology and basic engineering for bauxite mine, alumina refinery and smelter. NALCO is a major manufacturer and the largest exporter of alumina and aluminium in India. The production capacity is as follows:

Bauxite mine – 4.8 MT/annum

Alumina refinery – 1.5 MT/annum

Smelter plant – 0.345 MT/annum

Captive power plant – 960 MW

The environmental management plan being followed in the mines is given below:

- Starting from the day of mine development, both the short term and long term mining plans ensure;
  - A Periphery barrier with green belt around the mine
  - Garland drains ahead of mine to divert fresh surface run-off water to avoid contamination
  - Separate handling and preservation of top soil for its use in afforestation
  - Sequential back-filling of mined out areas by fragmented overburden of advancing faces.
- The overburden excavated initially for mine development and the excavated materials of construction period are dumped in selected sites with care taken for slope stability, drainage control and these dumps have been covered by afforestation with bunds below to restrict wash cuts.
- Bench floors below the surface contour and drainage within the mines collect the polluted water in large sumps within the back-filled area.
- Maximum use of Ripper Dozers in both overburden and bauxite faces & back-hoe shovels for soft bottom bauxite is in practice to minimise the effects of blasting.
- Sprinklers are constantly used throughout the mine, Haul Roads and Crusher area to reduce dust pollution.
- Conveyor and transfer areas are covered.
- Various mining equipments are periodically checked for vibration, noise and air pollutions.
- Water flow and its quality in perennial springs in the valleys below are regularly monitored to assess the effect of mining.
- Re-shaping of mined out area to blend with surround land scape after back-filling by Overburden using top soil and extensive afforestation.
- Monitoring of Safety, Environment and Occupational Health aspects by a Multi disciplinary Environment Management team to ensure meeting of all statutory norms & Periodical audits on these aspects are also taken up through external agencies.
- Sociological and periphery development activities are continuously carried out for development of surrounding tribal areas.



- Afforestation is regularly carried out in freehold areas, valley slopes, periphery barriers, dump sites and reclaimed mined out areas. The high altitude nursery in mines provides required forest and indigenous species.
- So far, about 8,00,000 trees have been planted over more than 400 hectares of land alongwith avenue plantations, development of gardens and experimental plantation.

Achievements: After Ten years of operation, there has not been any significant change in climatic conditions. Doubt raised on the effects of mining on hydrological condition and perennial springs are now eliminated. Water flows in the springs have increased. The condition that it should be clear and free of any washouts or chemical pollution is now achieved. Mining has not disturbed the natural landscape and has no adverse effect' on land use pattern and habitation in the adjoining areas. The mine rehabilitation with reclamation of mined out areas followed by afforestation has proved to be successful. Waste land reclamation and afforestation with green belt development has been very effective. Further, the plateau top and slopes, which were barren earlier, has now come up with thick green vegetation. The drainage system with sumps in back-filled area alongwith this vegetation has increased the moisture level and have charged the aquifer. Today, Panchpatmali Bauxite Mine is assessed to be a model mine with respect to Environment Management & in particular for reclamation of mined out areas with extensive afforestation around the mine.

## *2.9 Corporate investment considerations*

In the mining sector, a number of countries have modified the mining statute or tailored suitably their policies and legislation in order to motivate assistance, both technical and monetary from agencies within the country and also from other countries. About 50 countries have already made changes in their statutes for inviting foreign investment. These include Chile, Mexico, China, Botswana, Zimbabwe, Zambia, etc. India came out with a new Industrial Policy in 1991 followed by a national Mineral Policy in 1993 in line with the concept of globalisation, privatisation and liberalization. The salient features are:

1. Introduction of foreign technology and funding in exploration and mining of high value and scarce minerals
2. Foreign equity investment in joint venture in mining with company incorporated in India. .
3. Allowing exports after meeting domestic demand

4. Giving preference to those who will take up mining for captive use in case the resources are not abundant

In February 2000, the Government has approved the policy of foreign equity holding up to 100 per cent through the automatic route for all minerals except diamond and precious stones. This covers exploration, mining, mineral processing and metallurgy. In the case of diamond and precious stones, foreign equity up to 74 per cent will be allowed on the automatic route for exploration and mining operations. Proposals seeking higher than 74 per cent foreign equity in diamond and precious stones shall be approved by FIPB on case to case basis.

Areas in which the foreign equity support is required includes exploration, new mining ventures, mines which are likely to be closed otherwise, difficult mining operations, rehabilitation of closed mines, working of lean deposits and complex ores, economic recovery of by-products, utilization of low grades, etc. Potential also lies in the down stream of the mining sector such as smelting, refining and special fabrication in modernization and also capacity augmentation. Alumina and aluminium should also draw attention particularly because of high energy cost. Another feature which is to be paid heed to is the fact that only the large deposits, large operations and large parties are attracting FDI and small mining operations are being ignored altogether. In small mining sector mobile crushers, custom milling, working of pocketed lensoid deposits may also be considered for the purpose. The FDI assistance can come from:

1. International agencies such as the World Bank, IMF, UNDP, Asian Development Bank
2. Multinationals from countries such as the USA, Canada, Australia, South Africa, the UK
3. Bilateral agreements from countries such as France, Russia, China, Australia, etc
4. Regional agencies such as European Community, Colombo Plan, Common Wealth Secretariat
5. Commercial Banks across the globe
6. Non resident Indians

The foreign companies, which are taking interest in negotiating with mining sector, include CRA Mineral Exploration with ACC and BHP with HZL both from Australia, RTZ of UK with OMC and De Beers of South Africa with Reliance. All these negotiations were on exploration. Ministry of Mines,

Government of India has established an International Co-operation Cell in the Ministry for the purpose.

Till October 2001 FIPB has approved about 70 proposals in the mining and mineral sector for a likely total investment of about Rs.40 billion of which the foreign company inflow is expected to be about Rs.2.5 billion. The details are given in Annexure 10.

### Disinvestment by the Central Government in Public Sector Companies operating in the mining sector

Extensive programme of State disinvestment from public sector companies (including mining companies) have been initiated in India. Privatisation can take a variety of forms:

1. Regulation of state assets through full divestment of states interests
2. Partial sale of state ownership
3. Injection of private capital for the development of new ventures

In the non-coal mining companies, the approach 2 is being followed, whereas for the coal sector the approach 3 is being followed. The case of some public sector companies are discussed below.

The privatisation of natural resources, energy and infrastructure sectors reflects a fundamental reappraisal of the state's role in the development of natural resources for national benefit. The state's direct role from being the owner, operator and regulator of mineral production is being reduced to that of a facilitator of mineral production. The state aims to ensure social benefits from mineral extraction through the mechanism of regulation and taxation.

#### *Bharat Aluminium Company Ltd (BALCO)*

BALCO is one of the profit making companies in the country. It makes a net profit of about Rs 100 crore with a turnover of Rs 1,000 crore. The paid up share capital is Rs 500 crore and networth is Rs 600 crore. Initially three organizations were taking interest in acquiring shares of BALCO. These included HINDALCO in association with ALCOA, NALCO and Sterlite Industries. However, NALCO opted out soon after. Jardine Fleming India Securities Ltd. worked as advisors for disinvestment purposes. The evaluation of shares was carried out based on discounted cash flow, balance sheets and assets. The decision went in favour of the Mumbai based Sterlite Industries, which bought 51 per cent shares of BALCO for Rs 551=50 crore. The company has interests in copper and aluminium.

However, as soon as the acquisition of BALCO took place, it did not go well with the newly carved State of Chhattisgarh, local authorities, Unions and workers. Work was struck for a long period of 67 days, which could be resumed only on 9<sup>th</sup> May 2001 after an agreement on 24 demands was arrived at. These demands were primarily on personnel matters. It was assured that there would not be any retrenchment for one year, and a voluntary scheme thereafter will be floated to shed the excess flab.

The Hon. Supreme Court approved the deal of acquisition of BALCO by Sterlite in its judgment of 10.12.2001. BALCO is in need of upgradation of technology as it has been operating on the technology, which is two decades old by now. Also, upscaling of alumina and smelting facilities is necessary. Meanwhile, Orissa State has allotted to BALCO a bauxite mine, Sashubhumali, in Koraput district, which has reserves of 30 million tonnes of high grade mineral.

#### *Hindustan Zinc Limited (HZL)*

HZL is another public sector undertaking with a very sound infrastructure. It produces 65 per cent of the zinc in the country and also substantial quantities of lead, silver and sulphuric acid. HZL is planning to have a green field zinc smelter at Kapasan in Rajasthan, which will have annual capacity of 100,000 t. At present the Government of India holds 75.92 per cent shares, 24.08 per cent having been already sold to the public as far back as 1992-93. It is now proposed to make over another 26 per cent to a strategic partner with a five-year lock in period. Government of India will therefore, retain 49.92 per cent shares. However the Government plans to have its six Directors including the Chairman on the 11-member Board. The remaining five Directors including the Managing Director will come from the strategic partner. As many as eight companies have indicated interest in acquiring the shares of HZL, which include Sterlite Industries, Indo-Gulf Corporation, Glancore International, Phelps Dodge, etc. The bidder is required to have a turnover of at least Rs 650 crore per annum and a networth of Rs 350 crore. BNP-Paribas has been appointed as a global advisor.

#### *National Aluminium Company Limited (NALCO)*

NALCO is one PSU, which has been doing consistently well over the last several years. Its operating margin is 38.9 per cent compared to another aluminium manufacturer BALCO at 8.2 per cent. The authorized capital is Rs. 300 crore and paid up capital is Rs 644.31 crore. NALCO has expanded its mining capacity

to 2.8 from 2.4 million tonnes per annum. Further expansion plans include alumina from 800,000 to 105,000 t, bauxite from 2.8 to 4.8 million tonnes, aluminium from 230,000 to 345,000 t and power from 720 to 840 mw at a total estimated cost of Rs 4,000 crore. NALCO is considering diversification in manufacturing wheels, car components, zeolite and special grade alumina. The Company was also to sign an agreement with the Moscow Institute of Steel Alloys and Romelt Sail of India Ltd. to have a project for extracting pig iron from red mud. NALCO has already shed its 13 per cent shares to financial institutions, retail investors and employees. Further 30 per cent shares are under consideration for being off loaded to bring the same down to 57 per cent. However, in a recent development, the Parliament Standing Committee on Industry has recommended that the disinvestment of NALCO may be avoided and assistance should be given to increase its presence in the international market.

#### *National Mineral Development Corporation (NMDC)*

NMDC is one PSU, which is presently giving excellent results. The present holding of the Central Government in NMDC is 96.36 per cent. A small part of the holding, 1.62 per cent has already been off loaded. The rest is with the State Government and other collaborators. Disinvestment Commission has recommended 20-25 per cent FDI, which also includes a joint venture to bring latest technology and management practices.

#### *Kudremukh Iron Ore Company Limited (KIOCL)*

KIOCL has an iron ore mine, which is performing well in spite of all odds in the past and also in the present. The present problem is on account of delays in getting the renewal of the mining lease for a reasonable period. KIOCL is a profit-making company. The disinvestment to the extent of 74 per cent has been planned leaving 26 per cent with the Government. The plans have been deferred for the time being, pending finalization of mining lease extension.

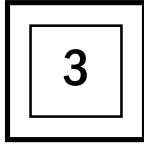
#### *Hindustan Copper Limited (HCL)*

At present HCL is in a lot of financial problems as the company is incurring severe losses primarily because of the depressed prices of copper metal in the international market. The accumulated losses are as much as Rs 300 crore and liabilities total up to Rs 150 crore. Another Rs 150 may be required to overhaul the present facilities. HCL is planning to hive off its facilities in Khetri and Talaja in another company by allowing the joint venture partner to acquire 51

per cent stake. The disinvestment has been kept on hold for the time being as the Unions are taking time in appreciating the value assigned to the shares.

## 2.10 Summary of the findings of the study

- The mining and mineral industry in India has grown significantly in the last three decades;
- Contribution from public sector companies in the value of mineral production was 84% in 1999-2000;
- The share of mining and quarrying in India's Gross Domestic Product is in the range of 2.2 to 2.5% only. But mining and quarrying contributes 10 to 11% in industrial sector's GDP;
- Share of mineral exports in the total merchandise exports from the country was 17.6% (1998-99). Excluding export of diamonds (cut), the export of other minerals and ores account for only 3.1% of the total exports;
- The share of imports of ores and minerals was 21% (1998-99) of all merchandise imports. Here also raw diamonds and crude oil accounts for 82% of mineral imports;
- The royalty rates on minerals are observed to be high as compared to many countries;
- The organized mining sector employed about 0.7 million in 1999 as against a total workforce of 27 million in the organized sector. In the mining sector, coal industry employs about 70% of the workforce followed by iron ore, limestone and manganese. No estimates are available of the workforce in the unorganized mining sector. In India, as per 1991 census data, about 259 million are employed in the unorganized sector;
- National Mineral Policy has been announced in 1993 to attract private investment (domestic and foreign) in the mining sector to sustain / expand its growth, MMRD Act has been amended accordingly. Rules for foreign direct investment have also been liberalized;
- Small scale mining contributed about 6% of the total value of mineral production in 1998-99 but employs a much larger workforce. There are many issues including technical, environment, and social, which need to be addressed;
- Community issues: Land acquisition is one of the most important issues over which many social action groups are agitated. They are forcing the companies and government to address the issues of land acquisition and Resettlement and Rehabilitation.



## Sustainable development of mining areas

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The negative public perception of the mining industry will not change overnight regardless of the mining industry supporting any initiative for environmental upgradation. The violation of expected environmental norms by any one organization raises a question mark about the credibility of the industry as a whole. The mining industry must turn to the local community in which they operate directly in order to win the peoples' hearts and minds. The mining industry must re-establish the connection between its products and the people that use them through a comprehensive public outreach effort. There is a need to re-examine each mining operation and improve or maintain their community relations programmes and sustainable environmental management systems. There is a need to increase the professional staffs for these programmes and systems in lieu of expensive and ineffective campaigns, which are only seen by the public as propaganda. And finally we must come to grips with the economic, environmental, and ethical consequences of closure of mines. These are the challenges to be addressed in the future. Three topics are discussed in the following paragraphs.

### **3.1 Priority areas for further research**

#### *3.1.1 Developing tri-sector partnership in mining areas*

Mineral development, while increasing employment and incomes in mining and related activity, does create serious environmental damage and can undermine other socio-economic development opportunities of local communities. It is necessary to address both the environmental damage and the socio-economic constraints created by mining operations. The attempts to redress these impacts have so far been piecemeal and adhoc with little research or consultation with the groups that are supposed to benefit from these actions. The net result has been a growing level of dis-satisfaction amongst the community. Therefore, it is necessary to carryout research / studies to correct this narrow approach through adopting a multi-dimensional approach that integrates a number of activities that range from the technical to the social, to training and capacity building. It is increasingly evident that lasting solutions require tri-sector partnerships

between company, government, and community. New and innovative aspects of this research would be as follows.

- Forming strategic partnerships to work towards lasting solutions
- Addressing frontally issues and constraints that will lead to improved health and quality of life, and thus sustainable economic and social development of local communities stressed by current mining activity
- Improving the social and environmental knowledge base to allow local communities to control more actively their own environments, in particular women community members
- The project will add value to the management of societal change by:
  - Transferring and building upon existing experiences and techniques from a wide range of studies on mining, environment, and communities
  - Strengthening the information base of all stakeholders
  - Developing tools for delivering this new knowledge to all levels of society
  - Contributing to learning processes at all levels of society
  - Ensuring that tools for use of knowledge reach all potential stakeholders

The research study can be taken up in 1-2 mining areas as case studies. It has wider applicability and potential for replication as lessons learned and the experience of forming partnerships and identifying strategies for sustainable development can be used elsewhere.

### *3.1.2 Mine closure: issues and options*

A mine may be closed because of the following reasons:

- Mineral deposit gets depleted
- The mine become uneconomic to work due to
  - prices of minerals/metals being un-remunerative
  - grade of the deposit is too low
  - workings are too deep
  - nature of the ore poses problems in efficient metal extraction
- The mine workings have become unsafe
- The lode or the seam has become unworkable
- The mining lease expires, and no further renewal is granted by the Government; and
- Mine management loses interest in further operations

It will be seen from the above, that in the closure of mines the economic factors play a major role than other factors. Before the mine is closed, the Government



is required to be informed under Rule 23 of the Mineral Conservation and Development Rules, 1988. Action is also required to see that harmful gases are not released from the mine to the atmosphere and therefore, the workings are to be properly sealed. The mine workings should also be fenced both in case of open cast as well as under ground mines in order to avoid any untoward incident.

Many times it is seen that when a mining lease is about to expire the management does not apply for its extension for some reason even though the deposits can be worked. The mine is thus abandoned though the reserve could have been mined for a few more years. The statutory authorities are not in a position to compel the mine management to apply for renewal of extension even though the action of the management is against the interest of conservation of mineral resources. Once the decision for closing a mine is taken several problems arise. Unions become active. The local politicians become restive. The questions for rehabilitation and employment of local populace are raised. Environmental degradation is left unattended.

Presently there is no specific legislation in India, which covers the requirements for environmental protection during the closure of a mine. However, MoEF, while giving environmental clearance for a project may specify / approve plans for reclamation work to be carried out on closure of mines indicated in the EIA/EMP of the project. Recently, MoEF has introduced a system of demanding a closure plan from the mine operators, which should be submitted 5 years before actual closure of mining operations.

### Planning for closure

Planning for closure can generate benefits at two levels: First, at the level of the local community or region; and second, at the level of the mining company. Closure of mines, in the absence of any systematic planned closure process, may have serious consequences for local communities because of their dependence on a livelihood provided by the mining activity. A forward looking approach can involve developing viable economic alternatives, transforming mined land for productive purposes such as for growing cash crops, and possibly timing new mining projects in the region to follow on consecutively. It can also provide the framework for the psychological adjustment to unemployment. Planning for closure can enable the region's resources to be mined in a manner that does not result in a net impoverishment at the close of mining operations and avoid damage to ecosystems that have a positive value to local communities and

business activities. The benefits of planning for closure to a mining company are that it:

- Ensures that stocks of water, air, land (components of the natural environment necessary for production) are available for future operations;
- Provides a healthy environment for miners to work and live thereby maintains / increases the productivity of the workers;
- Reduces the extent and expense of final restoration;
- Reduces future risk of more strict regulation;
- Improves the companies profile and track record in environmental matters; and
- Reduces tensions and conflicts with local communities.

The attractiveness of the concept of planning for closure as a whole life-cycle approach by managing the environmental impacts from mining from development through operations to closure is rooted in the time factor. The greater the time lapse between the occurrence of environmental damage and its restoration, the greater (in most cases) will be the resources (both human and financial) necessary for addressing the problem.

The identified issues for research study are:

- Adequate attention has not been given to the issue of environmental protection on closure of mines. Closure of mines involves safety, environment and social aspects, which need a comprehensive study. In India, there are too many examples of abandoned mines both in the coal and non-coal sector;
- There are no detailed guidelines on de-commissioning of a mine site and also post closure-monitoring programmes;
- This has led to the deterioration of environmental quality in many areas in the country.

A study on closure of mines addressing the above issues is another potential area for research.

### *3.1.3 Small scale mining: issues*

In India, as per as International Labour Organisation report (1999), there are more than 10,000 small scale mines (of which 10%–60% may be illegal), employing about 1 million people including women and children. The extent of illegal mining is often linked to difficulties in obtaining permits. In these mines,

there are serious problems as regards health and safety, the environment, hygiene and working conditions including child labour.

Like most economic activities, small-scale mining has positive and negative aspects. It is closely linked to economic development, particularly in the rural sector in many developing countries and helps to stem rural-urban migration, maintaining the link between people and the land. It makes a major contribution to foreign exchange earnings; enables the exploitation of what otherwise might be uneconomic resources; and it has been a precursor to large-scale mining. The social and economic complexity of small-scale mining and the fact there is no model on which to develop a sound theory or programme needs a research study, which can cover the following issues.

- Occupational health and safety;
- Women and child labour;
- Legislative framework;
- Links between large and small-scale mines; and
- Co-ordinating assistance to small-scale mining.

### **3.2 Policy reforms for contribution towards sustainable development in mining areas**

In spite of a very elaborate mining legislation in the country, it is felt that there exist a number of gaps. These gaps need to be bridged. Certain amendments are on the anvil both at the level of the Central Government and also various State Governments, which would be of assistance to the prospective investors. Some suggestions are as follows:

- It would be seen that there is a very comprehensive legislation for the conservation of non-coal minerals. The Minerals Conservation and Development Rules, 1988 which were framed under the Mines and Minerals (Regulation and Development) Act, 1957 have been specifically provided for the purpose which have since been amended from time to time. Indian Bureau of Mines is a Central Government Department, which looks after this aspect of mineral development. On the other hand, there is no exclusive regulation to take care of conservation aspect of coal.

While comparing the two sectors, coal and non-coal, it will be appreciated that coal alone is much more vital to the economy of the country compared with the 80 or so minerals in the non-coal sector in terms of tonnage and value produced and also industrial utility. Moreover, the country is deficient in coking coal. Therefore, it appears that it would be appropriate to have regulation to look after the conservation of coal with the

exclusive back up in terms of legislation and facilities for overseeing the implementation of the same.

- Some preferential treatment has been extended to the weaker section of the society while granting the mineral rights in respect of small deposits in the scheduled areas. As per the National Mineral Policy, 1993, preference should be given to scheduled tribes for the grant of mining lease in such areas. As per the decision of the Hon. Supreme Court, the mining leases in tribal areas are to be awarded to tribals only. Thus, there is a need to gear up the mining industry for the same in terms of facilities and funding.
- Ever since the liberalization of Indian economy was effected, not much benefit has flown to mineral sector in terms of private and foreign participation. Thirteen minerals (iron ore, manganese ore, sulphur, chrome, gold, diamond, copper, lead, zinc, molybdenum, tungsten, nickel, platinum group of minerals) earlier reserved for exploitation by public sector only, were opened for private investment.

It is a task for the policy makers to make the mineral development process investor friendly. A prospective investor, domestic or foreign, may feel that a major deterrent to investment is the existing slow and heavy multi-layered bureaucratic procedure and administrative mechanism resulting in unwanted and avoidable delays.

Some experts have been advocating single window clearance though this has not gained much of favour over the years. Here, the single-window means single-table under the single-roof. The interdepartmental co-ordination need not be the botheration of the applicant. Presently the applicant for mineral concessions is required to run from department to department and within the department from desk to desk even to obtain the relevant application forms. The clearance from various departments is not concurrent and it may take 2-3 years or even more. The applicant gets exasperated, and the loss of time means escalation in the cost of the project. Under such conditions, the concept of 'Single Window Clearance' can serve ideally, as it would be of great help in terms of saving energy and time.

The Government of Rajasthan has opened a website on which the applications for concessions can be filed on e-mail. This means that they are making efforts even to go beyond the concept of the single window clearance. Uttar Pradesh has compiled all relevant application Performa in a booklet form so that the investors know what he is supposed to do for obtaining mineral concessions.

- The Central Cabinet has recently approved increased private participation in coal exploration and its mining. The amendment of relevant Act will pave the way for almost unrestricted participation of private sector in coal.
- As certain minor minerals are gaining importance in the Indian economy, they may be considered for inclusion in the list of major minerals for their proper exploitation at the national level. Granite is a major claimant for the revised categorization.
- Comprehensive legislation for development of off-shore mineral resources for their operating rights need to be framed in view of the absence of commercial deposits of nickel and cobalt in the country and deficiency of copper resources. This legislation may be separately framed for reconnaissance, exploration and production phase.
- There is a time limit of 90 days for the approval of mining plans but there are no time limits for the grant of mining lease which should be introduced. This may be different for major and minor minerals, and minerals in forest and non-forest areas. This state of Andhra Pradesh has a time limit for granting mining lease as 3, 6 and 9 months for minor and major minerals in non-forest and forest areas.
- Only a few states have come out with a mineral policy. Some have not even framed minor mineral laws for the exploitation of the same.
- The State Governments may have website just as Rajasthan which should include information on areas already prospected and areas for which prospecting license and mining lease have already been granted and yet to be granted. In respect of the areas, which are still available for concessions, base level information such as type and occurrence of minerals in the area, extent and quality of reserve, availability of infrastructure facilities, water and energy, and environmental and sociological parameters may be available on it. This will assist the prospective investor to know for which areas he should apply for concessions. This will eliminate infrastructure applications altogether. The State Governments may also notify the areas, which can be offered for mining leases. This notification should take place only after the clearances from the entire concerned Central and State Government agencies have been obtained. The purpose of the notification is also to seek the reaction of NGO's and local populace.
- The concept of compensatory afforestation has drawn flak as it stipulates only the number of trees in equivalent area and is silent on the type of trees. In this connection, the example of Kudremukh comes to mind where rose wood and sandal wood trees were cut away and acacia, silver oak and

eucalyptus were planted under compensatory afforestation. Thus the superior variety of trees were replaced by inferior ones. Also, the trees planted may not suit the wildlife of the area.

- In Part B of the First Schedule of the MMRD Act, a number of minerals have been mentioned as atomic minerals. Some of these minerals can perhaps be brought out of the Schedule and included within the ambit of MCDR and MCR as proposed by FIMI.
- Presently, there is no safeguard against the action of the party that has a mining lease but does not intend to apply for its renewal though mineable reserves of the minerals are still available for the renewal period.
- Mining industry is in need of funding and therefore, setting up of Mining Finance Corporation and Mining Areas Infrastructure Boards may be considered. Such organizations may be funded by diverting a part of royalty to them. The example of the Government of Maharashtra is relevant in this case. A Mineral Development Fund has been started to which a part of royalty is diverted for the development infrastructure in the mining Districts and also for developing mines.
- The rates of royalty and various other taxes on mining sector is too high, and ways need to be found out to reduce the burden.
- It is seen that when a project is announced, local pressure groups become active against it, based on dis-information. As a result of this, the project sometimes is abandoned or gets delayed adding to its cost. An element of transparency should be cultivated so that the informed public opinion can be created in favour of the project.
- FIMI has alleged that some State Governments are adopting a system where an applicant can not directly obtain mining lease. All the leases are first granted to the State mining corporation, which then transfers it to the applicant under MCR Rule 37 (2). This is often done in lieu of consideration which may be as high as Rs 20 crore in lump sum or an amount equal to the royalty on production resulting in eroding the profitability of the project. Some element of legislation is required to be incorporated to safeguard against this practice.
- Procedure for providing exploration data to the prospective parties by the States and Central governments should be made simple and business oriented.
- In view of very low rates of dead rent, the entrepreneurs are inclined to take large areas under lease, pre-empting the other interested parties from applying for concessions. This will have deleterious impact on the growth of

the mining industry. Therefore, instead of charging dead rent on the basis of size, it is felt that a minimum royalty may be fixed on the basis of quantity.

- In case of large deposits, mining concessions should be given for the whole area to a single party which can develop a model mine and fulfil the requirement of its consuming industry over long periods, instead of granting to a number of parties creating environmental and other problems.
- The regulatory consents, permissions and approvals should be granted for the term of the mining lease by the concerned authorities and not for any other specified period.
- Though the upper limit of the area of the mining lease is defined, there is no minimum area stipulated in the legislation. This has resulted in very small areas being granted mining leases wasting resources in minerals, funds and efforts.
- It is seen that the surface rights are not granted even after the mining lease is awarded to the party. This causes avoidable delays in commencing operations and anxiety to the party.

# List of annexures

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- Annexure 1** List of mining and mineral companies
- Annexure 2** List of mining and industry associations
- Annexure 3** Index of mineral production 1995-96 to 1999-2000
- Annexure 4** Rates of royalty and dead rent for minerals
- Annexure 5** Acts, rules and legislations on mineral rights, surface access environment, forestry etc.
- Annexure 6** Acts, rules and regulations on labour, trade unions dispute resolution etc.
- Annexure 7** List of central trade unions organisations
- Annexure 8** Campaign against unjust mining by social action groups
- Annexure 9** List of NGOs working for the cause of environmental and social justice
- Annexure 10** List of FIPB Approvals as on 15.10.2001



**Annexure 1****List of Mining & Mineral Based Companies**

<b>S.No</b>	<b>Companies</b>	<b>Minerals / Mineral Products</b>
1.	A.P. Trivedi Sons	Manganese Ore
2.	Adityana Limestone & Quarry Mines	Limestone, quarry mines & cement
3.	Agrawal Graphite Industries	Graphite
4.	Almora Magnesite Ltd.	Magnesite, limestone – dead burnt magnesite, cement.
5.	Amrapali & Company	Mining and refining china clay
6.	Anand & Company	Lime, limestone and dolomite
7.	Andhra Phosphate Ltd.	Rock phosphate (apatite), vermiculite (associated mineral)
8.	Andhra Pradesh Mineral Development Corpn.Ltd.	Barytes(lumps/ powder), black granite, ball clay/washed clay, rock phosphate(apatite) and vermiculite. Development of minerals with private participation: gold, diamond, bauxite, heavy mineral beach sands, galaxy granite, low grade iron ore, semi-precious stones and moulding sand (silica sand)
9.	Apco Mineral Industries	Limestone, dolomite, calcite, china clay
10.	Aruna Industrial Minerals	Feldspar, quartz, graphite, mica, vermiculite, calcite, barytes etc.
11.	Aryan Mining & Trading Corporation Pvt. Ltd.	Manganese ore and iron ore
12.	Ashapura Minechem Ltd	Bentonite, bauxite, barytes, attapulgit, bleaching clay, salt, silica sand, china clay in semi crushed, crushed or powder form
13.	The Associated Cement Companies Ltd	Cement
14.	Associated Stone Industries (Kotah) Ltd.	Kota stone (limestone flooring slabs)
15.	Associated Soapstone Distributing Co. Pvt. Ltd.	Soapstone
16.	B.C. Mohanty & Sons Pvt. Ltd.	Chromite ore concentrate
17.	Balaji Produce Company	Iron ore, manganese ore, red oxide and yellow oxide
18.	Bandekar Brothers Pvt. Ltd	Iron and manganese ore
19.	Bansal Khanij Udyog	Bauxite, ochre
20.	Banwarilal Newatia	White and grey limestone, pyrophyllite, soapstone, china clay, quartz, red and yellow ochre.
21.	Bellary Iron Ores Pvt Ltd.	Iron ore / high grade iron ore fines of +65% calibrated iron ore
22.	Bharat Aluminium Company Ltd	Bauxite, aluminium
23.	Bharat Mines & Minerals	Iron ore and manganese ore
24.	Bihar Sponge Iron Ltd	Sponge iron
25.	Birla Cement Works (Unit of Birla Corporation Ltd)	Limestone to cement plant
26.	Bombay Minerals Ltd.	Calcined bauxite
27.	Broken Hill Proprietary Company Ltd	Coal, iron ore, zinc, copper etc.
28.	Bussa Associates	Ferrous minerals, alloys and raw materials consultants
29.	Carbon & Graphite Products	Limestone, feldspar, quartz, magnetite, graphite flakes and powder, fireclay
30.	Cement Corporation of India Ltd	Limestone, cement
31.	Century Cement	Limestone, cement

<b>S.No</b>	<b>Companies</b>	<b>Minerals / Mineral Products</b>
32.	Chhabboolal Shivkumar	Red ochre, yellow ochre, red oxide, white earth, bauxite, laterite, china clay, etc.
33.	Chettinad Cement Corporation Ltd	Cement
34.	Chowgule & Co. Ltd	Iron ore and iron ore pellets
35.	D.K.Trivedi & Sons	White, green & black marble
36.	Dalmia Cement (Bharat) Ltd	Iron ore, limestone, magnesite and cement clinker
37.	Deccan Limestone Mining Co (P) Ltd.	Limestone and calcined lime
38.	Deccan Mining Syndicate (P) Ltds	Iron ore, manganese ore and iron ore high grade fines
39.	Dharti Dhan Private Limited	Soapstone
40.	East India Minerals Limited	High grade size calibrated iron ore/iron ore fines
41.	Eastern Minerals	Diaspore in lumps as well as in fines, calcined diaspore, quartz, calcite, feldspar and granite.
42.	EMCO Goa Pvt. Ltd.	Iron ores (iron ore lumpy fines)
43.	Ecomen Consultants (P) Ltd	Environmental monitoring & consultancy in all minerals
44.	English Indian Clays Ltd.	Processed kaolin (china clay)
45.	Enterprising Enterprises	Granite
46.	Essel Mining & Industries Ltd	Manganese ore, iron ore fines, iron ore
47.	Ferro Alloys Corporation Limited	Ferromanganese, high carbon ferrochrome, medium carbon ferrochrome and low carbon ferrochrome, charge chrome, chrome ore
48.	Gandhmardhan Sponge Industries (P) Ltd.	Iron ore
49.	Gimpex Limited	Barytes, bentonite, feldspar, talc, garnet, etc.
50.	Gujarat Ambuja Cement Ltd	Limestone and marl, Cement
51.	Gujarat Heavy Chemicals Ltd. (Lignite Mining Division)	Mining for captive consumption
52.	Gujarat Mineral Development Corpn. Ltd	Lignite, bauxite, fluorspar, calcined bauxite
53.	H.R.Gaviappa & Co	Iron ore
54.	H. G. Rangan Goud	Iron ore
55.	Hargovind Pandya & others	Iron ore
56.	Harris Minerals Supply Company	Ochre and clays
57.	Himalaya Stone & Lime Co.	High grade limestone, gypsum and dolomite
58.	Hind-Nippon Rural Industries (P) Ltd	Granite
59.	Hindalco Industries Limited	Bauxite, alumina, aluminium
60.	Hindustan Copper Ltd	Blister copper, copper cathode, copper bar & CC Rod
61.	Hindustan Zinc Ltd	Zinc, lead, cadmium, silver, etc.
62.	Hothur Traders	Iron ore and manganese
63.	Indian aluminium company ltd	Bauxite, aluminous laterite, kaolin, calcined alumina and aluminium hydrate
64.	Indian Metals & Ferro Alloys Ltd	Chromite, quartz, magnesite, ferrosilicon, high carbon and medium carbon ferrochrome and silicon metal
65.	The India Cement Ltd	Cement
66.	Indian Rare Earths Ltd	Ilmenite, rutile, leucoxene, zircon (zircon flour and opacifier), sillimanite, garnet, monazite, rare earths compounds, tri sodium phosphate (dodecahydrate), thorium nitrate, etc

S.No	Companies	Minerals / Mineral Products
67.	Ispat Industries Ltd.	Steel
68.	J.K. Minerals	Manganese ore
69.	Jai Bharat Khanij Udyog	Limestone, chromite, quartz, pyrophyllite, soapstone, bentonite, etc.
70.	Jailal Bharatlal	Bauxite, ochre, china clay, laterite
71.	Jagdish Mines & Metals (P) Ltd	China Clay and silica sand
72.	Jain China Clay Mines Private Ltd	China clay
73.	Jay Minerals	Bentonite, calcite, talc (soapstone), china clay available in micronised and also in coated foam
74.	Jayant Quarry Works	Aggregate for construction/marble
75.	Jayaswals Neco Ltd.	Pig iron
76.	Jindal Steel & Power Limited	Sponge iron, M.S. Slabs and high carbon ferro chrome
77.	K.C. Pradhan	Iron ore, manganese ore, limestone, dolomite and fireclay
78.	K.L. Poddar & Sons (P) Ltd	Calibrated iron ore, manganese ore, cement grade limestone
79.	K.M. Mehte	Bauxite
80.	K.M. Parvathamma	Iron ore in lumps, fines and in concentrates and red oxide of iron mineral (both in lumpy and powder form of 300 mesh).
81.	Kailash Marketing Associates	Ceramic, glass and refractory industries
82.	Kamaljeet Singh Ahluwalia	Iron ore and manganese ore
83.	Kariganur Mineral Mining Industry	Super high grade iron ore, HAD lumps, high grade fines and calibrated iron ore to sponge iron plants.
84.	Kudremukh Iron Ore Company Ltd	Mining beneficiation of iron ore concentrate/ production of pellets.
85.	Larsen & Toubro Ltd (Awarpur Cement Works)	Limestone and cement
86.	Libbi Mines (P) Ltd	Iron ore
87.	Lakshmi Cement (A divn. Of JK Corpn. Ltd.)	Cement
88.	M.G. Mohanty	Iron ore: (a) sponge plant grade (+68% Fe content Heamatite), (b) blast furnace grade (c) Manganese ore
89.	Madhya Pradesh State Mining Corporation Ltd	Rock phosphate, dolomite, bauxite, pyrophyllite, diaspore, tin, corundum, granite, sand
90.	Maihar Cement	Cement
91.	Mangalore Mineral Traders	Washed and unwashed silica sand and resin coated sand.
92.	Manganese ore (India) ltd	Manganese ore of all grades, manganese dioxide ore of all grades, high carbon ferro manganese (78% manganese), electrolytic manganese dioxide
93.	Manikgarh Cement limestone Mines	Cement
94.	Mehboob Transports Company	Iron ore
95.	Mekal Minerals	Ochres, White earth, bauxite, laterite
96.	MMTC Ltd	Super star trading house
97.	MSPL Ltd	Iron ore
98.	Mine Chemie Corp.	Bentonite, fullers earth, barytes
99.	Misirilal Jain & Sons	Iron ore, chromite, dolomite, graphite, manganese
100.	Mohan Bhai Minerals Pvt. Ltd	Mining and providing earth moving equipment
101.	Mukunda Shenoy Nagar	Consultancy

S.No	Companies	Minerals / Mineral Products
102.	Mysore Cements Ltd	Cement
103.	Nagri Mining Co. Ltd	Manganese ore
104.	Nalwaya Mineral Industries Pvt. Ltd	Soapstone
105.	Narmada Cement Company Ltd (A Subsidiary of Larsen & Toubro Ltd)	Cement
106.	National Aluminium Company Ltd	Bauxite, alumina hydrate, calcined alumina and aluminium
107.	National Enterprises	Iron ore, manganese ore and bauxite ore
108.	National Mineral Development Corporation Ltd	Iron ore, diamonds
109.	Neogy & Sons	Ochre
110.	New India Mining corporation Private ltd	Old iron ore mines owner of west coast of arabian sea in state of maharashtra, India
111.	Orissa Minerals Development Co. Ltd	Iron ore and manganese ore
112.	Orissa Mining Corporation Ltd	Iron, manganese, chromite, limestone, gemstone, decorative stone, bauxite, china clay, vanadiferous titaniferous magnetite etc.
113.	Patnaik Minerals pvt ltd	iron ore, manganese ore limestone and dolomite
114.	Phulad Mines and Minerals Pvt ltd	Magnesite/ calcined magnesite
115.	Prabhudas Vithaldas	Bauxite ore, limestone, red ochre, whiting chalk, china clay, bentonite, calcite, abrasives, calcined minerals etc.
116.	Prabhudayal Agrawal	Quartz, quartzite, silica sand, fireclay, china clay, chromite, manganese and titaniferous magnetite
117.	Pyrites Phosphates & Chemicals Ltd	Pyrites
118.	Rajashree Cement (A unit of Grasim Industries Ltd)	Cement
119.	Rajasthan Barytes Ltd	Barytes, calcite and soapstone
120.	Rajasthan State Mineral Development Corpn. Ltd	Gypsum, limestone (all grades), granite, rock phosphate, graphite, fluorspar, lignite
121.	Rajasthan State Mines & Minerals Ltd	Rock Phosphate, gypsum, SMS grade limestone, green marble and lignite
122.	Rana Hanuman Singh Minerals	Dolomite and manganese ore
123.	Rashtriya Ispat Nigam Ltd / Visakhapatnam Steel Plant	Captive mines of dolomite, limestone, manganese and river sand / steel, pig iron, project engineering and consultancy
124.	Resources International	Iron ore
125.	Rio Tinto India Pvt ltd	Mineral exploration, iron ore, coal etc.
126.	Rungta Mines ltd	Iron ore-BF and sponge grade blue dust, crushed fines, manganese ore - BF and ferromanganese grade, dioxide and fines, limestone, dolomite, fire clay, bauxite, soapstone
127.	S.B. Minerals	SHG lumps, calibrated ore, SHG fines
128.	S.K. Jhanjhri	Mica
129.	S.K. Sarawagi & Co. Pvt Ltd	Manganese and iron ores in all grades and sizes
130.	Salgaocar Mining Industries Ltd	Iron ore
131.	Sanghi industries Ltd (Cement Division)	Lime stone and cement
132.	Sangrah Mines & Minerals	N.A

S.No	Companies	Minerals / Mineral Products
133.	Sandur Manganese & Iron Ores Ltd	Manganese ore and iron ore
134.	Dr. Sarojini Pradhan	Iron, manganese, graphite, limestone and dolomite
135.	Satya Narayan Paul	Manganese ore of various grade
136.	Sesa Group of Companies	Production, processing and export of iron ore, shipping and ship building, manufacture of iron ore processing equipments, production of pig iron, production of metallurgical coke.
137.	Shabro Intrade Pvt Ltd	Exports/importer of ferro alloys and other mineral products
138.	Shree Bhagwati mines & Stone Processing (Raj.) Pvt. Ltd	Quartzite, silica sand
139.	Shree Pratap Commercial Co. Pvt. Ltd	Asbestos, mica, quartz, felspar
140.	Singbhum Mineral Co.	China clay, manganese ore, iron ore
141.	Sociedade de fomento industrial ltd	Production/exports of ferroalloys/ refractories
142.	Steel Authority of India Ltd	Iron ore, limestone, dolomite
143.	Stone and Mineral Associates ltd	Marble blocks and slabs
144.	Sukhdeo Prasad Goenka	Low silica limestone, low silica dolomite, graphite, manganese.
145.	Surendra Nath Mohanty	Iron ore, manganese ore, bauxite, fireclay, quartz and quartzite
146.	T.P. Minerals (P) Ltd	Natural Crystalline graphite, manganese ore
147.	Tamilnadu Magnesite Ltd	Magnesite & dunite
148.	Tamilnadu Minerals Ltd	Granite dimensional blocks and granite finished products, vermiculite & exfoliated vermiculite, quartz & feldspar, limestone, limeshell, silica sand, fireclay, Indian standard sand & graphite
149.	Tata Chemicals Ltd	Limestone, soda ash and cement
150.	Tata Iron And Steel Comp Ltd	Iron ore, coal, manganese ore, dolomite, chrome ore, magnesite/dunite, limestone, finished steel (including saleable steel)
151.	The KCP Limited	Limestone
152.	The Madras Aluminium Company Ltd	Aluminium
153.	Timblo ltd	Iron ore fines and lumps
154.	Transworld Garnet India Pvt Ltd	Garnet sands
155.	Tribeni Prasad Rungta	Magnetite, dolomite, soap-stone, graphite, granite.
156.	Trident Minerals	Iron ore
157.	Trimex industries ltd	Mine owners, processors and exporters of barytes, bauxite, bentonite, feldspar, mica, quartz, iron ore, garnet sand, hematite, granite and stone producers.
158.	Tungabhadra Minerals Pvt Ltd	Iron ore
159.	Udaipur Mineral Development Syndicate (P) ltd	Soapstone
160.	V.M. Salgaocar and Bro. Ltd	Iron ore
161.	V.S. Dempo & Co. Pvt. Ltd	Processed iron ore
162.	VBC Ferro Alloys Ltd	Ferrosilicon, ferrochrome
163.	Vibhuti Gudda Mines Private Ltd	Iron ore lumps of basic grade and super high grade fines of +65% calibrated ore.
164.	Visa Industries ltd	Mineral beneficiation plant
165.	Vijayanagar Minerals (P) ltd	Steel
166.	West-End Minerals and Exports (P) ltd	Iron and manganese ores

S.No	Companies	Minerals / Mineral Products
167.	Wolkem India Ltd	Wollastonite and calcite minerals

### Central public sector companies with Coal & Lignite

- |                             |                                    |
|-----------------------------|------------------------------------|
| 1. Coal India Ltd.          | 6. Western Coal fields Ltd         |
| 2. Eastern Coal fields Ltd  | 7. South Eastern Coal fields Ltd   |
| 3. Bharat Coling Coal Ltd   | 8. Mahanadi Coal fields Ltd        |
| 4. Central Coal fields Ltd  | 9. Neyveli Lignite Corporation Ltd |
| 5. Northern Coal fields Ltd |                                    |

### Fertiliser companies

- |  |   |
|--|---|
| 1. Coromandel Fertilizers Ltd.                 | 16. Nuchem Ltd.                               |
| 2. DCM Shriram Industries Ltd.                 | 17. Paharpur Fertilizers and Chemicals Ltd.   |
| 3. Gujarat Heavy Chemicals Ltd.                | 18. Paradeep Phosphates Ltd.                  |
| 4. Gujarat Narmada Valley Fertilizers Co. Ltd. | 19. Power Finance Corporation Ltd.            |
| 5. Hindustan Fertilizer Corporation Ltd.       | 20. Power Grid Corporation Ltd.               |
| 6. Indian Organic Chemicals Ltd.               | 21. Punjab Alkalies and Chemicals Ltd.        |
| 7. Kanoria Chemicals and Industries Ltd.       | 22. Punjab Chemicals and Pharmaceuticals Ltd. |
| 8. Khaitan Chemicals and Fertilizers Ltd.      | 23. Rashtriya Chemicals and Fertilizers Ltd.  |
| 9. KRIBHCO                                     | 24. Shriram Fertilizers and Chemicals         |
| 10. Liberty Phosphate Ltd.                     | 25. Shriram Foods and Fertilizer Industries   |
| 11. Madras Fertilizers Limited                 | 26. Surat Electricity Company Ltd.            |
| 12. Mangalore Chemicals and Fertilizers Ltd.   | 27. The Dharamsi Morarji Chemical Co. Ltd.    |
| 13. Modi Alkalies and Chemicals Ltd.           | 28. Fertilizers and Chemicals Travancore Ltd. |
| 14. Nagarjuna Fertilizers and Chemicals Ltd.   | 29. The Fertilizers Corporation of India Ltd. |
| 15. National Organic Chemical Industries Ltd.  |   |

### Iron and Steel Companies

- |   |                      |
|---|----------------------|
| 1. Bellary Steels & Alloys Ltd          | 6. VS Dempo & Co Ltd |
| 2. Indian Metals & Ferro Alloys Limited | 7. SESA Goa Ltd      |
| 3. USHA Martin Industries Ltd           | 8. Usha Ispat Ltd    |
| 4. Nippon Denso Ispat Limited           | 9. Malvika Steel Ltd |
| 5. Steel Authority of India Ltd         |                      |

### Cement Companies

- |   |                                       |
|---|---------------------------------------|
| 1. Ambuja Cement Eastern Limited                | 11. Gujarat Sidhee Cement Limited     |
| 2. Ambuja Cement Rajasthan Limited              | 12. IDCOL Cement Limited              |
| 3. Andhra Cements Limited                       | 13. Indo-Rama Cement Limited          |
| 4. Birla Corporation Limited                    | 14. J K Cement Works                  |
| 5. Cement Corporation of India Limited          | 15. J K Udaipur Udyog Limited         |
| 6. Chettinad Cement Corporation Limited         | 16. Jammu and Kashmir Cements Limited |
| 7. Dalmia Cement (B) Limited                    | 17. Jaypee Rewa Cement                |
| 8. Diamond Cements                              | 18. Kalyanpur Cements Limited         |
| 9. Grasim Cement                                | 19. Kanoria Industries Limited        |
| 10. Grasim Industries Limited (Cement Division) | 20. Kesoram and Vasavdatta Cement     |

21. Lafarge India Limited
22. Lakshmi Cement
23. Larsen and Toubro Limited
24. Madras Cements Limited
25. Maihar Cement
26. Malabar Cements Limited
27. Mangalam Cement
28. Manikgarh Cement
29. Mawmluh Cherra Cements Limited
30. Mysore Cements Limited
31. Narmada Cement Company Limited
32. OCL India Limited
33. Orient Cement
34. Panyam Cements and Mineral Industries Limited
35. Penna Cement Industries Limited
36. Prism Cement
37. Priyadarshini Cement Limited
38. Rajashree Cement
39. Saurashtra Cement Limited
40. Shree Digvijay Cement Company Limited
41. Shriram Cement Works
42. Sri Vishnu Cement Limited
43. Tamil Nadu Cements Corporation Limited
44. The K C P Limited
45. Vasavdatta Cement
46. ZUARI Cement
47. Binani Cement Limited
48. India Cements Limited

**Annexure 2****List of mining & mineral based association**

S.No	Association	Minerals / Mineral products
1.	All India Granites & Stone Association	Granites and dimension stones
2.	Ambaji Marble Quarry and Factory Association	Marble
3.	Banspani Mine Owners' Association	N.A
4.	Cement Manufacturers' Association	Cement
5.	Chhattisgarh Mineral Industries Association	N.A
6.	Chotanagpur Bauxite Mineowners Association	Bauxite
7.	Eastern Mining Association	Iron ore, manganese ore, china clay, limestone, bauxite
8.	Federation of Mining Association of Rajasthan	All types of industrial minerals and dimensional stones.
9.	Goa Mining Association	Iron ore and manganese ore
10.	Goa Mineral Ore Exporters' Association	Iron ore, manganese, bauxite and ferromanganese
11.	Gujarat Mineral Industry Association	Association of mine owners, mineral dealers and mineral based industry
12.	The Indian Ferro Alloy Producers' Association	Ferro alloys
13.	Indian Soapstone Producers' Association	Soapstone
14.	Kodarma Mica Mining Association	Mica
15.	Marble Gangsaws & Tiles Plants Association	N.A
16.	Mineral Merchants' & Manufacturers' Association of India	N.A
17.	Mineral Industry Association	Manganese ore
18.	Tamilnadu Granite Quarry Owners & Exporters Association	Granites
19.	The Thane Quarry Owners Welfare Association	N.A
20.	Federation of Indian Mineral Industry	All Minerals

**Other Industry Associations**

1. Orga Name
2. Asbestos Cement Products Manufacturers Association
3. Chemicals and Petrochemicals Manufacturers Association
4. Cold Rolled Steel Manufacturers Association of India
5. Federation of Indian Mineral Industries
6. Fertiliser Association of India
7. Indian Chemical Manufacturers Association
8. Indian Ferro Alloy Producers Association (THE)
9. Indian Non-ferrous Metals Manufacturers Association
10. Indian Paper Manufacturers Association
11. Indian Pulp and Paper Technical Association
12. Pig Iron Manufacturers' Association of India
13. Process Plant & Machinery manufacturers Association of India
14. Society of Indian Automobile Manufacturers (SIAM)
15. Sponge Iron Manufacturers Association
16. Cement Manufacturers Association



**Annexure 3****Index Of Mineral Production 1995 - 96 To 1999 - 2000****Base 1993 - 94 = 100**

<b>Mineral</b>	<b>Weight</b>	<b>95 - 96</b>	<b>96 - 97</b>	<b>97 - 98</b>	<b>98 - 99</b>	<b>99 - 00</b>
All minerals	1000.00	121.68	120.78	126.78	125.42	126.79
Fuel	857.180	121.30	120.77	127.08	125.65	126.50
Coal mining	324.628	110.62	115.57	119.75	118.18	120.67
Coal	307.610	109.94	115.04	119.29	117.52	120.63
Lignite	17.018	122.97	125.17	128.01	130.05	121.32
Pet. & nat. Gas	532.552	127.80	123.94	131.55	130.20	130.05
Natural gas ( u )	134.182	128.08	130.51	150.21	157.32	164.53
Petroleum ( crude )	398.370	127.71	121.73	125.27	121.07	118.44
Mcdr '88 minerals	123.092	115.33	115.62	121.18	120.11	125.39
Met. Minerals	80.765	114.53	113.23	120.58	116.92	119.00
Bauxite	3.877	100.54	109.78	110.36	119.42	123.84
Chronite	11.017	159.63	136.74	142.32	133.20	159.30
Copper ore	8.352	94.57	77.77	90.13	84.45	62.30
Gold	5.363	98.12	139.37	137.16	129.30	117.69
Iron ore	38.428	113.03	114.28	126.96	121.10	123.19
Lead cong	1.650	114.38	111.92	113.06	116.70	116.74
Manganese ore	6.122	108.29	110.30	96.81	90.66	92.30
Tin	0.055	43.18	24.49	30.90	30.93	17.91
Tungsten	0.004	122.95	72.92	0.00	0.00	0.00
Zinc conc.	5.897	99.63	95.46	100.82	120.60	124.05
N. Met. Minerals	42.327	116.87	120.19	122.33	126.18	137.58
Agate	0.002	74.76	55.17	32.97	21.24	16.55
Apatite	0.053	87.32	74.11	87.93	113.68	94.33
Asbestos	0.069	57.15	65.14	52.39	48.20	43.87
Ball clay	0.134	138.12	133.91	123.29	122.14	109.98
Barytes	1.084	84.11	72.54	86.08	125.56	38.87
Calcareous sand	0.089	141.33	48.81	14.47	6.36	0.00
Calcite	0.080	105.53	52.62	73.01	87.45	83.87
Chalk	0.105	134.64	112.74	104.97	108.43	128.00
Clay ( others )	0.006	177.55	163.81	221.84	226.13	487.19
Corundum	0.010	6.84	18.15	4.56	3.90	0.09
Corundum ( ruby )	0.002	741.38	579.31	1397.31	0.00	0.00

Mineral	Weight	95 - 96	96 - 97	97 - 98	98 - 99	99 - 00
Diamond	0.471	155.71	165.62	161.24	179.90	211.56
Diaspore	0.059	90.89	131.42	61.46	82.47	95.26
Dolomite	3.082	107.96	100.74	86.86	84.85	83.49
Dunite	0.037	991.91	918.55	1120.81	1331.50	1328.40
Felsite	0.003	122.72	125.41	153.63	68.15	68.05
Felspar	0.042	122.72	116.69	128.78	133.50	185.65
Fireclay	0.170	105.84	95.06	105.23	109.79	86.20
Fluorite ( cons. )	0.643	100.75	87.50	49.79	0.21	0.97
Fluorite ( graded )	0.056	93.12	116.65	125.37	91.44	1087.05
Fusch . Quartzite	0.000	11.04	0.65	0.00	126.62	45.45
Garnet ( abrasive )	0.044	128.79	87.42	159.04	275.11	394.27
Garnet ( gem )	0.000	71.58	77.76	89.23	112.96	87.63
Graphite	0.113	162.30	140.27	131.34	161.59	129.62
Gypsum	1.199	130.23	131.11	130.25	134.51	195.06
Jasper	0.005	86.03	91.05	100.13	100.25	98.00
Kaolin	1.539	128.84	120.18	122.59	114.80	116.63
Kyanite	0.023	83.31	65.16	56.52	57.13	60.40
Laterite	0.102	148.89	145.52	130.13	130.75	161.92
Limekankar	0.036	249.03	267.77	307.26	204.49	167.67
Limeshell	0.083	107.23	80.96	83.27	92.85	92.30
Limestone	25.010	116.44	123.53	132.81	136.81	153.79
Magnesite	1.127	92.12	100.78	99.71	93.39	88.04
Mica ( crude )	0.078	86.17	91.91	79.82	69.80	59.88
Ocher	0.073	171.28	159.28	176.95	185.46	202.13
Perlite	0.001	177.95	122.05	31.50	81.50	150.79
Phosphorite	4.488	126.37	129.48	110.25	121.89	109.66
Pyrites	0.073	122.61	124.87	109.11	77.16	8.29
Pyrophyllite	0.063	155.94	153.35	111.53	99.51	124.84
Quartz	0.092	78.42	100.43	117.75	143.14	127.88
Quartzite	0.087	123.51	118.22	32.47	48.00	66.61
Salt ( rock )	0.009	58.94	87.10	90.35	84.10	90.71
Sand ( other )	0.192	119.29	113.71	142.61	179.23	145.04
Shale	0.021	157.42	242.80	319.14	424.25	405.26
Silica sand	0.620	60.26	80.97	76.28	90.32	165.74
Sillimanite	0.120	73.95	69.41	101.39	98.67	121.56
Slate	0.008	96.70	78.05	106.26	96.85	98.13
Steatite	0.731	128.32	126.10	112.65	114.31	125.26

Mineral	Weight	95 - 96	96 - 97	97 - 98	98 - 99	99 - 00
Vermiculite	0.010	77.43	175.02	202.37	184.07	120.24
Wollastonite	0.133	154.79	156.91	157.57	152.67	188.43
Minor minerals	19.728	148.41	148.41	148.41	148.41	148.41
Granite	9.790	135.27	135.27	135.27	135.27	135.27
Marble	9.008	169.98	169.98	169.98	169.98	169.98
Slate	0.930	77.75	77.75	77.75	77.75	77.75

**Annexure 4****Rates of Royalty and Dead Rent for Minerals****Ministry Of Mines  
Notification**

New Delhi, the 12th September, 2000

**G.S.R. 713(E).**- In exercise of the powers conferred by sub-section (3) of section 9 of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957), the Central Government hereby makes with immediate effect, the following further amendments to the Second Schedule to the said Act, namely :-

In the Mines and Minerals (Development and Regulation) Act, 1957, for the Second Schedule, the following Schedule shall be substituted, namely :-

**"THE SECOND SCHEDULE"**

(See section 9)

Rates of royalty in respect of minerals at item 1 to 10 and 12 to 38 and 40 to 51 applicable in all states and union territories except the state of West Bengal.

1. Agate		Ten percent of Sale price on advelorem basis.
2. ( i ) Apatite		Five percent of Sale price on advelorem basis.
(ii) Rock Phosphate	(a) above 25 per cent P205	Eleven per cent of sale price on ad valroem basis
	(b)upto 25 per cent P205	Five per cent of sale price on ad valroem basis
3. Barytes		Five and half per cent of sale price on ad valorem basis
4. Bauxite, Laterite		Zero point three five percent of London Metal Exchange Aluminium Metal Price Chargeable on the contained Aluminium Metal in Ore produced
5. Brownilmenite (Leucoxene, Ilmenite, Rutile and Zircon)		Two per cent of sale price on ad valorem basis
6. Cadmium		Ten per cent of sale price on ad valorem basis
7. Calcite		Fifteen per cent of sale price on ad valorem basis
8. Chromite		Seven and half per cent of sale price on ad valorem basis
9. Copper		Three point two per cent of London Metal Exchange Copper metal price chargeable on the contained copper metal in ore produced
10. Corundum		Ten per cent of sale price on ad valorem basis
11. Diamond		Ten per cent of sale price on ad valorem basis
12. Felspar		Ten per cent of sale price on ad valorem basis

13. Fire Clay (Including Plastic, pipe, lithomargic and natural pozzolanic clay)		Twelve per cent of sale price on ad valorem basis
14. Fluorspar (also called fluorite)		Five per cent of sale price on ad valorem basis
15. Garnet	(a) abrasive  (b) Gem	Three per cent of sale price on ad valorem Ten per cent of sale price on ad valorem
16. Gold	(a) Primary  (b) By-product	(a) One and half per cent of London bullion market association price (commonly referred to as "London price") chargeable on the contained Gold metal in ore produced (b) Two and half per cent of London bullion market association price (commonly referred to as "London price") chargeable on the by product Gold metal actually produced
17. Gypsum		twenty per cent of sale price on ad valorem basis
18. KYANITE		Ten per cent of sale price on ad valorem basis
19. Lead		Five per cent of London Metal Exchange lead metal price chargeable on the contained lead metal in ore produced
20. MAGNESITE		Three per cent of sale price on ad valorem basis
21. Manganese Ore	(a) Ore of all grades  (b) Concentrates	Three per cent of sale price on ad valorem basis One per cent of sale price on ad valorem basis
22. Crude Mica, Waste and Scrap mica		Four per cent on sale price on ad valorem basis
23. Nickel		Zero point one two percent of London Metal Exchange nickel metal price chargeable on contained nickel metal in ore produced
24. Pyrites		two per cent of sale price on ad valorem basis
25. Pyrophyllite		Fifteen per cent of sale price on ad valorem basis
26. Ruby		Ten per cent of sale price on ad valorem basis
27. Selenite		Ten per cent of sale price on ad valorem basis
28. Sillimanite		Two and half per cent of sale price on ad valorem basis
29. Silver	(a) By products  (b) Primary silver	Five per cent of London Metal Exchange silver metal price chargeable on by product silver metal actually produced Five per cent of London Metal Exchange Silver metal price chargeable on the contained silver metal in ore produced
30. Talc, Steatite and Soapstone		Fifteen per cent of sale price on ad valorem basis
31. Tin		Five per cent of London Metal Exchange Tin metal price chargeable on the contained Tin metal in ore produced.
32. Vermiculite		Three per cent of sale price on ad valorem basis
33. Wollastonite		Ten per cent of sale price on ad valorem basis
34. Zinc		Six point six per cent of London Metal Exchange Zinc metal

		price chargeable on contained zinc metal in ore produced
35. All other minerals not here-in-before specified		Ten per cent of sale price on ad valorem basis

\* Rates of royalty in respect of item 11 relating to Coal Including Lignite as revised vide notification number G.S.R. 748 (E), dated the 11th October, 1994 and notification number G.S.R. 27 (E), dated the 13th January, 1995 of Government of India, Ministry of Coal will remain in force until revised through a separate notification by the Ministry of Coal.

\*\* Rates of royalty in respect of item 39 relating to Sand For Stowing as revised vide notification number G.S.R. 214(E) dated the 11th April, 1997 will remain in force until revised through a separate notification by the Ministry of Coal.

Note : The rates of royalty for the State of West Bengal in respect of the minerals except the mineral specified against item No.11 shall remain the same as specified in the notification of the Government of India in the Ministry of Steel and Mines (Department of Mines) number G.S.R. 458 (E), dated the 5th May, 1987."

(F. No. 3/4/98-MVI)

**(S. P. GUPTA)**

**JOINT SECRETARY TO GOVERNMENT OF INDIA**

Note : The Second Schedule was amended earlier vide notification numbers.:-

1. GSR No. 175(E) dated 31st March, 1975.
  2. GSR No. 407(E) dated 14th July, 1975.
  3. GSR No. 584(E) dated 13th December, 1975.
  4. GSR No. 321(E) dated 12th June, 1978.
  5. GSR No. 2(E) dated 1st January, 1979.
  6. GSR No. 67(E) dated 13th February, 1979.
  7. GSR No. 63(E) dated 12th February, 1981.
  8. GSR No. 449(E) dated 23rd July, 1981.
  9. GSR No. 458(E) dated 5th May, 1987.
  10. GSR No. 856(E) dated 14th October, 1987.
  11. GSR No. 516(E) dated 1st August, 1991.
  12. GSR No. 100(E) dated 17th February, 1992.
  13. GSR No. 748(E) dated 11th October, 1994.
  14. GSR No. 27(E) dated 13th January, 1995.
  15. GSR No. 214(E) dated 11th April, 1997.
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[TO BE PUBLISHED IN THE GAZETTE OF INDIA, EXTRAORDINARY, PART-II, SECTION 3, SUB-SECTION(i)]

**MINISTRY OF MINES**

**NOTIFICATION**

New Delhi, the 12th September, 2000

G.S.R. 714(E).- In exercise of the powers conferred by sub-section (2) of section 9A of the Mines and Minerals (Development and Regulation) Act, 1957 (67 of 1957), the Central Government hereby makes with immediate effect, the following amendments to the Third Schedule to the said Act, namely :-

In the Mines and Minerals (Development and Regulation) Act, 1957, for the Third Schedule, the following Schedule shall be substituted, namely :-

**"THE THIRD SCHEDULE"**

(See section 9A)

**RATES OF DEAD RENT**

(APPLICABLE FOR ALL STATES AND UNION TERRITORIES EXCEPT THE STATE OF WEST BENGAL)

1) The rates of dead rent applicable to the leases other than those obtained for supply of raw material to the industry owned by the concerned lessee :

(Rates of Dead Rent in Rupees per hectare per annum)

Item Number	Category of The mining lease	1 <sup>st</sup> year of the lease	2 <sup>nd</sup> to 5 <sup>th</sup> year of the lease	6 <sup>th</sup> to 10 <sup>th</sup> year of the lease	11 <sup>th</sup> year of the lease and onwards
(a)	Lease area upto 50 hectares	Nil	70	140	200
(b)	Lease area above 50 hectares but not exceeding 100 hectares	Nil	100	200	280
(c)	Lease area above 100 hectares	Nil	140s	230	350

2) In the case of lease obtained for the supply of raw material for the industry owned by the concerned lessee, the rates of dead rent would be applicable as given in respect of item number (a) above, irrespective of the lease area and the value of mineral.

3) One and half times the rates specified in item numbers (a), (b) and (c) above in case of leases granted for medium value mineral(s).

4) Two times the rates specified in item numbers (a), (b) and (c) above in case of leases granted for high value mineral(s).

Note : For the purpose of this notification,-

(1) (a) "high value minerals" means gold, silver, diamond, ruby, sapphire, emerald and all other gemstones (precious, semi-precious stones), copper, lead, zinc, asbestos (chrysotile variety), corundum, mica.

(b) "medium value minerals" means agate, chromite, manganese ore, sillimanite, vermiculite, magnesite, wollastonite, perlite, diaspore, apatite and rock phosphate, fluorspar (or fluorite), barytes.

(c) "low value minerals" means minerals other than high value minerals and medium value minerals.

(2) the rates of dead rent for the State of West Bengal shall remain the same as specified in the notification of the Government of India in the Ministry of Steel and Mines (Department of Mines) No. G.S.R. 458(E), dated the 5th May, 1987."

(F. No. 3/4/98-MVI)

**(S. P. GUPTA)**

**JOINT SECRETARY TO GOVERNMENT OF INDIA**

Note : The Third Schedule was amended earlier, vide notification numbers:-

1. GSR No. 458(E), dated 5th May, 1987.
2. GSR No. 856(E), dated 14th October, 1987.
3. GSR No. 214(E), dated 11th April, 1997.



**Annexure 5****Acts, Rules, Regulations and Orders**

**Category One:** relating to and/or impacting on the ownership of minerals, the granting of rights to prospect for and exploit minerals, and rights of surface access, environment, forestry, reclamation and rehabilitation, and local communities.

Acts/Rules/Regulations	Promulgation	Amendment	Brief Content
The Mines and Minerals (Regulation and Development) Act	1957	1986, 1994, 1999	The Act provides for regulation of prospecting, grant of lease and for mining operations under the control of the Central Government.
The Coal Bearing Areas (Acquisition and Development) Act	1957		An Act to establish, in the economic interest of India, greater public control over the coal mining industry and its development by providing for acquisition by the State of unworked land containing or likely to contain coal deposits or of rights in or over such land for the extinguishment or modification of such rights by accruing virtue of any agreement, lease, license or otherwise or for matters connected therewith.
Mineral Concession Rules	1960		These rules lay down the complete code in respect of grant and renewal of prospecting licenses as also for lease in respect of lands belonging to the state as well as belonging to private individuals.
Coal Mines (Nationalisation) Act	1973		An Act to provide for the acquisition and transfer of the right, title and interest of the owners in respect of the coal mines specified in the schedule with a view to re-organising and reconstructing such coal mines so as to ensure the rational, co-ordinated and scientific development and utilisation of coal resources consistent with the growing requirements of the country, in order that the ownership and control of such resources are vested in the State and thereby so distributed as best to sub-serve the common good, and for matters connected therewith or incidental thereto.
The Coal Mines (Conservation and Development) Act	1974		An Act to provide for conservation of coal and development of coal mines and for matters connected therewith or incidental thereto.
The Coal Mines (Nationalisation) Amendment Act	1993		The Act stipulates that on and from the commencement of the Coal Mines Nationalisation Act 1976, (a) no person other than a company engaged in: <ul style="list-style-type: none"> <li>i) the production of iron and steel</li> <li>ii) generation of power</li> <li>iii) washing of coal obtained from a mine or</li> <li>iv) such other use as the Central Government may by notification specify.</li> </ul> shall carry on coal mining operation in India, in any form.
The Land Acquisition Act	1894		An act for the acquisition of land needed for public purposes and companies and determination of compensation to be made on such acquisition
The Indian Forest Act	1927	Amendment by various State Government	An Act which consolidates the law relating to forests, the transit of forest produce and the duty leviable on timber and other forest produce.
The Forest	1980		An Act to provide for the conservation of forests and matters

Acts/Rules/Regulations	Promulgation	Amendment	Brief Content
(Conservation) Act including Rules			connected therewith. This Act is in line with the overall national objective of preserving and as a matter of fact, enhancing the forest cover. It has the stringent provision that no forest land may be diverted for non-forest use without prior approval of the Central Government. It lays down conditions for diversion of forest land for non-forest purposes including compensatory afforestation.
Water (Prevention and Control of Pollution) Act	1974		The Act aims at prevention and control of water pollution as well as restoration of water quality through the establishment of State Pollution Control Boards.
The Water (Prevention and Control of Pollution) Rules	1975	1988	The Rules are framed pursuant to the Act of 1974 to prevent and control water pollution and for maintaining or restoring wholesomeness of water.
Water (Prevention and Control of Pollution) Cess Act	1977		The Act is an evolving piece of legislation for and collecting cess on water consumed by certain specified categories of industry. Local Authorities may also specify categories of such industry. The Cess collected is to be used by CPCB & SPCBs to prevent and control water pollution.
The Water (Prevention and Control of Pollution) Cess Rules	1978		The Rules are framed under the Cess Act of 1977 for the levy and collection of a cess on water consumed by persons carrying on certain industries and by local authorities to augment resources of the PCBs.
Air (Prevention and Control of Pollution) Act	1981		An Act to provide for the prevention, control and abatement of air pollution, and for the establishment, with a view to carrying out the aforementioned purposes, of Boards, for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith.
The Air (Prevention and Control of Pollution) Rules	1982		The Rules are framed under the Act of 1981 detailing measures for prevention, control and abatement of air pollution.
Environment (Protection) Act	1986		Although there are existing legislations dealing directly or indirectly with several environmental matters, it is necessary to have a general legislation for environmental protection. Existing laws generally focus on specific types of pollution or on specific categories of hazardous substances. Some major areas of environmental hazards are not covered. There are inadequate linkages in handling matters of industrial and environmental safety. This is an umbrella Act providing for the protection and improvement of the environment.
The Environment (Protection) Rules	1986		The Rules framed pursuant to the Act of 1986 provides for the protection and improvement of the environment.
The Hazardous Wastes (Management and Handling) Rules	1989		The Rules make provision for management and handling of Hazardous Wastes; various restrictions; the responsibilities of the Occupier and role of PCB.
Manufacture, Storage and Import of Hazardous Chemical Rules	1989	1994	The Rules prescribe the duties of Occupier; independent safety audit and restriction on industrial activity involving hazardous chemicals.
Constitution of India	1950		

**Annexure 6**

**Category Two:** relating to and/or impacting on labour, trade unions, compensation, safety and health in the workplace, welfare outside the workplace, compensation, etc

Acts/Rules/Regulations	Promulgation	Amendment	Brief Content
The Mines Act	1952	1983	The Act seeks to regulate the working conditions in mines by providing for measures to be taken for the safety of workers employed in them and certain amenities for them.
Mines Rules	1955	1978, 1986	The Rules deal with appointment and qualification of certifying surgeons; medical examination of persons employed; appointment of Workmen's Inspector; constitution of Safety Committee; provision of first aid and medical appliances; weekly day of rest; compensatory day of rest; persons holding position of supervision or management; leave with wages; welfare amenities eg. Shelters, canteen; duties of welfare officer etc.
Coal Mines Regulations	1957	1961,62,63, 64,65,67,68, 69, 70,71, 72, 73, 74, 77, 78, 85 and 90	The Regulations prescribe the various returns and notice to be given and records to be maintained. The regulations further lay down manner of examination for grant of various competency certificates by government; the qualification and conditions of appointment of inspectors, surveyors engineers under and assistant manager and manager; duties and responsibilities of workmen, competent persons and officials; maintenance of plans and sections; means of access and egress; transport of men and materials; mine workings; precautions against dangers from fire, dust, gas and water, ventilation, lighting, explosives and shot firing; use of machinery, plant and equipment etc.
The Contract Labour (Regulation and Abolition) Act	1970		An Act prohibiting contract labour in specified categories of work.
The Explosive Act	1884	1978	An Act to regulate the manufacture, possession, use, transport, import and export of explosives.
Motor Vehicle Act	1939	1988 1994	The Act deals with registration, fitness, and other matters pertaining to motor

Acts/Rules/Regulations	Promulgation	Amendment	Brief Content
			vehicle.
Factories Act	1948		The Act seeks to regulate the working of factories.
The Trade Union Act	1926		An Act providing for registration of unions and their rights as registered trade unions.
Industrial Disputes Act	1947		An Act to make provision for the investigation and settlement of industrial disputes.
Workman's Compensation Act	1923		An Act to provide compensation by an employer to an employee in case of injury or death.
Payment of wages Act	1938		An Act to regulate the payment of wages to certain classes of employed persons.
Coal Mines Provident Fund and Miscellaneous Provisions Act	1948		An Act to make provision for the framing of a Provident Fund Scheme, a family pension scheme and a bonus scheme for coal mines employees.
Minimum Wages Act	1948		The Act prescribes the minimum wages for different categories of persons in different States.
The Maternity Benefit Act	1961		An Act to regulate the employment of woman in certain establishments for certain periods before and after childbirth and to provide for maternity benefit.
Payment of Bonus Act	1965		An Act to provide for the payment of bonus to persons employed in certain establishments on the basis of profits or on the basis of production or productivity and for matters connected therewith.
The Payment of Gratuity Act	1972		An Act to provide for a scheme for the payment of gratuity to employees engaged in factories, mines, oilfields, plantations, ports, railways, shops or other establishments and for matters connected there with or incidental thereto.
The Equal Remuneration Act	1976		The Act provides for the payment of equal remuneration to men and women workers as and for the prevention of discrimination on the ground of sex against women in the matter of employment and for matters connected therewith or incidental thereto.

**Annexure 7****List of central trade union organisations**

S.NO	Name & Address of Orgns.	Name of the Office Bearers
1.	Bhartiya Mazdoor Sangh, Tilak Gali, Paharganj, New Delhi-110055 Phone: 3620654,3624212 Fax No: 3517307	<ul style="list-style-type: none"> <li>▪ Shri Raman Girdhar Shah, President</li> <li>▪ Shri Hasu Bhai Dave, Genl. Secy.</li> <li>▪ Shri R.Venugopal Working President</li> </ul>
2.	Indian National Trade Union Congress, 'SHRAMIK KENDRA', 4, Bhai Veer Singh Marg, New Delhi-110001 Phone : 3747767,3747768 Fax No : 3364244	<ul style="list-style-type: none"> <li>▪ Shri G.Sanjeeva Reddy, President 6/B, LIGH, Barkatpura, Hyderabad-500027 Phone : 040 7564706</li> <li>▪ Shri Rajendra Prasad Singh, MLA General Secretary, Dhori Staff Quarters, Post Office Dhori, Distt. : Bokharo 825102 Phone : 0612-283392 0612-211159</li> </ul>
3.	Centre of Indian Trade Unions, 13-A, Rouse Avenue, New Delhi-1100002 Phone : 3221284 Fax No : 3221288	<ul style="list-style-type: none"> <li>▪ Shri E.Balanandan (M.P), President,</li> <li>▪ Shri M.K.Pandhe, Genl. Secretary.</li> </ul>
4.	Hind Mazdoor Sabha, 120, Babar Road, New Delhi-110001 Phone : 3315519 Fax No : 3411037	<ul style="list-style-type: none"> <li>▪ Shri A.Subramanian, President</li> <li>▪ Shri Umraomal Purohit, General Secretary, 1<sup>st</sup> Poddar Estate, Malad (East), Bombay-400097</li> </ul>
5.	All India Trade Union Congress, 24, Canning Lane, New Delhi-110001 Phone : 3386427, 3387320 Fax No : 3386427	<ul style="list-style-type: none"> <li>▪ Shri J. Chitranjan, President Phone : 3737549 ®</li> <li>▪ Shri K.L. Mahendra General Secretary. 4-22-493,Eitabar Chowk, P.O.Jubilee, Hyderabad (T-4417961)</li> </ul>
6	United Trade Union Centre (LS) 77/2/1, Lenin Sarani, Calcutta-700013 Phone : 033-2449085,246754 Fax No : 033-2465114, 2467754	<ul style="list-style-type: none"> <li>▪ Shri Ashutosh Banerjee, President</li> <li>▪ Shri Tapas Dutta, General Secretary</li> </ul>

	<p><b>Delhi Address :</b> 7085/10, Ground Floor, Rameshwari, Nehru Nagar, Karol Bagh, New Delhi-1100055 Phone : 5726631</p>	
7.	<p>United Trade Union Congress, 249, Bipin Behari Ganguly Street, 1<sup>st</sup> Floor, Calcutta-700012</p> <p><b>Delhi Address :</b> 17, Pherozeshah Road, New Delhi-110001 Phone : 3782109, 3782167</p>	<ul style="list-style-type: none"> <li>▪ Sh. Sushil Bhattacharya, President</li> <li>▪ Sh. S.R.Sen Gupta General Secretary</li> </ul>
8.	<p>National Front of India Trade Unions Institute Building, 10, Govt. Place East, Calcutta-700069 Phone : 2483708, 2480331</p>	<ul style="list-style-type: none"> <li>▪ Shri Naren Sen,</li> <li>▪ Shri O.P.Verma, President, (Delhi Unit), BA-4E, DDA Flats, Munirka, New Delhi-110067 Phone : 6165135, 6192608</li> </ul>

**Annexure 8****Campaign against unjust mining by Social Action Groups**

No.	Organisations involved	Issues	Forms of protest and demands of people
1.	Karanpura Ghati Bachao Andolan, INTACH, Jharkhand Mukti Morcha, etc.	Coal mining in the Damodar Valley – widespread displacement of tribals with attendant problems and large scale destruction of biodiversity	Adequate resettlement, compensation and employment. INTACH is focussing on preservation of the cultural and natural heritage of the region.
2.	Jharia Bachao Samity	Fire in the underground coal mines	Resettlement of those displaced by the underground fires.
3.	Nature's Beckon and Appropriate Technology Mission	Mining lease of a rock quarry on the Chanderinga hill on the banks of Brahmaputra in Dhubri, Assam	Chanderinga hill acts as a natural dam cum embankment, protecting the Bilasipara sub-division. Mining here will cause grave environmental damage apart from causing tremendous monetary losses to the State exchequer.
4.	Local Groups of workers union.	NMDC (Madhya Pradesh) is giving Baliadala iron ore mines to the private sector. This will cause retrenchment of workers	The workers along with their strong trade union are fighting against it. They are ready to give their life.
5.	Gandhamardan Suraksha Parishad	Orissa Mining Corporation has procured the licence to explore the Gandhamardan hills' mineral potential.	The people are protesting against this exploration as it poses danger to the tribal identity living in the forests.
6.	Srijan Lokhit Samiti	Forcible land acquisition for the Singrauli Coal Mines and the problems caused by the operation of coal mines in the region	People are protesting against improper fly ash disposal, degradation of water sources from the mine run off, industrial effluents and siltation. The protests are also against the large scale displacement and the attendant problems thereof.
7.	Green Society, Assam	Flagrant violation of the norms as under the EPA, 1986 by the North Eastern Coal Fields in the Tikkak open cast mine of Margherita district in Assam.	Environmental degradation by the mining process in the region. The coal here contains high sulphur content, which has seeped into the underground water and is causing diseases in human beings and destruction of aquatic and marine life in the region.
8.	NYSASDRI (National Youth Service Action and Social Development Research Institute)	Sukinda Chromite mines, Orissa. Environmental pollution, especially Chromium seeping into the rivers from mines which causes skin diseases, respiratory diseases and lung cancer to the people living in	People are in continuous protest. The various studies done on health hazards have brought the issue in the eye of public. The demand is for closure of mines and many mines are already closed.

		the region.	
9.	Path Agragami Sangh	Bauxite mining by Hindalco, owned by the Birlas in Palamu district of Bihar in village Oraspth and Kukurpth.	Land acquisition, no proper compensation, etc. The tribals (Nagacia) revolted back and Birla had to withdraw.
10.	KGF Protection and Development Fron	Kolar Gold Fiels, part of Bharat Gold Mines.	The retrenchment of 2500 workers by the way of voluntary retirement schems. However, the issue that was 'worker v/s management' has been changed to people v/s the mining industry'.
11.	Tarun Bharat Sangh, Rajasthan	Marble mining inside Sariska Wild Life Sancturary. Serious environmental threats.	After a strong peoples protest and writ petiiton in apex court during 1991, 215 mines were ordered closure. Again in 1996, TBS took similar campaign in Jaipur with same favourable result.
12.	Local environmental groups	Mining of 21 MTs of bauxite from Radhanagri, Maharashtra bison sanctuary.	The people and the Forest Dept. are opposing the project and have filed writ petition against the industry.



**Annexure 9****List of Non-Governmental Organisation**

Name of organization	Address & Telephone No.	Contact person
Centre for Tribal Conscientization	B-30, Kasturbawadi, Pune 411 015 Tel: (020) 6692942	Sharad D Kulkarni
National Committee for Protection of Natural Resources (NCPNR)	C/o. SPS, "Ashadeep", Jayanagar, Saptapur, Dharwad - 580 007 Tel: (0836) 774472/ 7773038 E-mail: <a href="mailto:jvs_srhiremath@vsnl.com">jvs_srhiremath@vsnl.com</a>	S R Hiremath
Visthapit Mukti Vahini	A4-85, A-Road, Telco Colony, Jamshedpur - 830 004 Tel: (0675) 282039	Arvind Anjum
Navodaya Educational & Environment Development Service (NEEDS)	2 <sup>nd</sup> Cross, Maruti Nagar, Near Kalabhairava Temple, (Benchinamaradi), Ranebennur - 581 115, Dist. Haveri Tel: (08373) 61054	S D Baligar
FARR	Muniguda, Dist. Raigad, Orissa	Bijay Kumar Babu
Ekta Parishad	Gandhi Bhavan, Shyamala Hills, Bhopal - 462 002, M.P	Gautam Bandhopadhyaya
Dasholi Grama Swarajya Sangh	Gopeshwar, Dist. Chamoli - 246401, U.P	Chandi Prasad Bhatt
Jungal, Jamin, Pani Lokhadhikar Andolan	Anjali, Plot No.22, Shulabh Co-op. Hsg Society, Tadwadi, Ambarnath East, Thane District - 421501 Tel: (0251) 682238	R V Bhuskute
Adivasi Punarvasan Andolan	C/o. Shanti Sewa Mandal at & P.O Manor, Tq. Palghar, Dist. Thane 401403	R V Bhuskute
Astha Sansthan	Udaipur, 39, Kharol Colony, Rajasthan - 313001 Tel: 560348 Fax: 523391	Bhanwar Singh Chadana
Gujarat Prakruti Sanrakshan Samiti	At P.O. Vedchchi - 394641, Tq. Valod, Distt. Surat (Gujarat)	Ashok Chaudhari
Vikasana	No.350, Kuvempu Road, Tarikere - 577228, Karnataka	Vergheese Cleatus
Jan Vikas Andolan (JVA)	The Timbaktu Collective, Chennakothapalli Village, Anantpur - 515101 Tel: (08559) 47337 (Farms) 47335 (o)	Bablu Ganguly
Yuvak Vikas Kendra	Plot No.265, HUDCO, Jalanagar, Near Water Tank, Bijapur - 586 101 Tel: (08352) 54870	Basavaraj Golay
Aranya Vikasa	Vasavanagudi, Shimoga Karanataka Tel: (08182) 77103	Rama H Gubbi
Vrikshamitra	Tandon Wada, Gandhi Chowk, Chandrapur - 442402 (Maharashtra) Tel: (07172) 58134 © Fax: 59126	Mohan Hirabai Hiralal
Janapara Vignana-Tantragnana Samathe	Nisarga', 6 <sup>th</sup> Cross, Station Road, Malamaddi, Dharwad - 580007, Karnataka Tel: (0836) 774472 Fax: 773038	Shankar G Hoskeri

Samvada Satichinchadhari	Chiploon, Dist. Ratnagiri, Maharashtra	Rajan Indulkar
National Front for Tribal Self Rule	F-1, Chenab Apartments, Prashant Nagar, Nagpur - 440 015	Vijay Lapalikar
Maharashtra Shetmajoor Ani Rojgar-hami Kamgar	Samanvaya Samiti, 54, Budhwar Peth, Kakakunwa Mansion, Laxmi Road, Pune 411002	Subhash Lomte
Joint Council for Tribal Action	10, Cauvery Nagar, S.V Koil Street, Crawford, Trichy - 620 012 (Tamil Nadu) Tel: (0431) 472826 Email: rocheopro@hotmail.com	N K Ramachandran
Ekta Parishad	Gandhi Bhavan, Shyamala Hills, Bhopal - 462002, M.P Tel: (0755) 543800	P V Raj Gopal
Action Committee for Protection of Common	Land Resources, Behind Post Office, Ranebennur, Karnataka	Dr S L Pawar
Samaj Parivartan Samudaya (SPS)	Ashadeep, Jayanagar, Saptapur, Dharwad - 580 007 Tel: (0836) 774472/ 7773038 Email: jvs_srhiremath@vsnl.com	Sudha Pawar
SAMATA	431, Aditya Nibha, Sriniketan Colony Road, No.3, Banjara Hills, Hyderabad - 500 034 Tel; (040) 248194	Ravi R Pragada
National Centre for Advocacy Studies	Serenity Complex, Ramnagar Colony, Pashan, Pune - 411 021 Tel: (020) 5898003/4 (o) 6694074(r)	John Samuel
Gram Vikas Seva Mandal	P.O. Mul - 441224, Dist. Chandrapur Tel: (07174) 20338/ 20538	Moreshwar Wadalkondalwar
Bharatiya Adim Jati Seval Sangh	Malviya Nagar, Nagpur	R K Malviya
Vidharbha Nature Conservation Society	Ganeshpeth, Tidke Ashram, Nagpur	S Dilip Gode
Indian Institute of Youth Welfare	134, Shivaji Nagar, Nagpur	M Gopalwar, Director
Prakriti Sampada Sangrakshan Parishar	Orissa	
FARR	Orissa	
Lakshman Naijak Society for Rural Development	Orissa	
Weaker Section Integrated Development Agency	Orissa	
Jharkandi Organisation against radiation (JOAR)	Jaduguda, Bihar	
Paryavaran Surakha Samiti	Bharuch, Orissa	
Vikalpa (A society for social development)	Gajan Mandi Road, Chandrapur, Maharashtra	Dr. Mamidwar
AGRAGAMEE	At PO Kashipur, Rayagada - 765 015, Orissa	Mr Achyut Das
Xavier Institute of Social Services (XISS)	Post Box &, Purulia Road, Ranchi, Jharkhand - 835 001	Dr Christopher Lakra
National Centre for Advocacy Studies	2, Santosh Apartments, Sheela Vihar Colony, Paud Road, Pune - 411 038	Mr John Samuel

National Institute of Small Mines		Mr S L Chakravarty
Advocacy & Action Research Unit	6 A, Dhakuria Station Lane, Calcutta - 700 031 S-116, Maitri Vihar, Phase - 1, Bhubaneshwar - 13	
Bindrai Institute for Research Study and Action (BIRSA)	P.O. Box No. 3, Chaibasa, Dist. Singhbhum West, Jharkhand - 833 201	
Lok Bharati	Sanosra, Shihor, Bhavnagar -364230, Gujarat	Dr. Arunkumar Dave
Vikas Bharti	Bishnupur Gumla Distt. Jharkhand - 835 331	Mr A K Bhagat
NYSASDRI	Santhasara PO, Sauthapur, Via. Gordia, Dhenkanal Distt. 759 016, Orissa	Mr S Samal
Tata Steel Rural Development Society	'E' Road, Bistupur, Jamshedpur -831 001	Mr V M Mehta
Chotanagpur Adivasi Sewa Samiti	Village Kasiadih, Charhi P O, Hazaribag Dt , Jharkhand - 825 336	Mr. A Herbert

**Annexure 10****List of FIPB Approvals as on 15.10.2001**(Source. <http://www.nic.in/mines/ppfinvest.html>)

S.No.	Date	Indian Co	Foreign Co	Country	Equity INR (Rs. Cr.)	Equity %	Activity	Location	FC Inflow
1.	2.8.94	Kandula Aluminium Co. Ltd.	C M P S & F Pty. Ltd.	Australia	311.50	53.43	Alumina: Manufacture of calcined alumina.	AP, Vizag	
2.	21.8.96	Bihar Sponge Iron Ltd.	North Limited, Australia.	Australia	0.50	50	Iron ore: Prospecting, mine development and mining.	Jharkhand, Si nghum	
3.	20.7.96	Ashton Mining India Pvt. Ltd.	Ashton Mining, Australia	Australia	50.00	50	Diamonds: Exploration and mining.	Ori., MP & AP	
4.	22.7.96	Hindustan Zinc Ltd.	BHP Minerals International, Australia.	Australia	38.00	50	Prospecting for base metals	Rajasthan	32
5.	2.11.96	RGC Mining Pvt. Limited.	RGC Mauritius Ltd. (Australia)	Australia		100	Mineral Sands: Exploration of minerals sands.	TN: Tut. & Tirun.	0.08
6.	2.11.96	Geomysore Services (India) Pvt. Ltd.	Australia India Resources, N.C. Australia	Australia	950.00	100	Gold: Exploration and exploitation.	karnataka & A.P.	
7.	30.10.96	BHP Minerals India Pvt. Ltd.	BHP Mineral Holdings Pvt. Ltd., Australia	Australia	2.38	100	Minerals: Exploration and mining joint ventures.		1.5
8.	18.10.96	ACC-Rio Tinto Ltd.	Rio Tinto Minerals Development Ltd.	Australia	12.50	62.5	Minerals: Exploration of minerals.		9.5
9.	20.7.96	S R L (India)	Strait Resources Ltd.	Australia		100	Minerals: Exploration, processing and exploitation.		
10.	28.11.98	Australian Indian Resources (India) Pvt.Ltd.	India Mining Investment Pty. Ltd., Australia.	Australia	9.50	100	Prospecting and Exploration of Gold and Base Metal Ores.		
11.	15.11.99	Drillcorp Western Deephole	Drillcorp Western Deephole	Australia	47.50	100	Drilling operations for exploration in minerals & associ. Sectors		
12.	17.4.2000	AusRutile India Pvt. Ltd.	Austpac Resources N.L.	Australia	18.53	74	Exploration of Beach Sand minerals	Chatrapur, Orissa	
13.	29.5.2000	Astro Mining Ltd.	Astro Mining N.L.	Australia	5.00	100	Exploration of minerals, precious metals and base metals		
14.	7.12.96	Pro Am Explorations (I) Pvt. Ltd.	Pro Am Exploration Corporation, Canada	Canada	0.05	100	Minerals: Natural mineral resources and oil.	TN;A.P;MP;Ke rala	0.07
15.	8.5.98	Indian Aluminium	Alcan Ltd.	Canada	284.44	54.6	Aluminum		

S.No.	Date	Indian Co	Foreign Co	Country	Equity INR (Rs. Cr.)	Equity %	Activity	Location	FC Inflow
16.	21.12.96	Limited Meridian Minerals India Pvt. Ltd.	Meridian Peak Resources Corporation	Canada	19.00	100	Minerals: Exploration in Rajasthan the mining sector.		5.89
17.	10.1.2000	Meridian Peak (India) Pvt. Ltd.	Meridian Peak Resources Corporation	Canada	19.00	100	Mineral Exploration in the mining sector.		5.89
18.	24.1.2000	BHP Khanij Anveshna Pvt. Ltd.	BHP World Exploration Inc.	Canada	8.70	100	Prospecting & exploration for minerals, mining other than iron		
19.	17.7.2000	ADI Gold Mining Pvt. Ltd.	Pebble Creek Resources Ltd.	Canada	0.89	89	Exploration & Mining for Cu, Lead, Zn in Dist. Pittoragarh, UP	UP	
20.	31.8.96	Lum Mawshun Minerals Pvt. Ltd.	Lafarge Surma Cement	France	55.93	74	Limestone: Mining and export.	Meghalaya	0.73
21.	12.9.98	Micafine Ratan (Bharat) Pvt. Ltd.	Micromineral Micafine , Germany	Germany	0.10	10	Production of Dry & Wet Ground Mica Powder		
22.	14.6.97	Ferro Ore & Maritime Pvt. Ltd.	Marubeni Corporation, Japan.	Japan	23.75	50	Iron Ore: Mining of iron ore.	Goa.	
23.	9.5.98	Daibeck India Abrasive Pvt. Ltd.	Daibeck Co. Ltd., Korea	Korea	5.49	100	Garnet: Manufacture of Industrial Garnet Powder.	TN, Chengai MGR	3.49
24.	20.3.99	TDT Copper Ltd.	Taihan Electric Wire Co. Ltd. (69.19%) - {Tomen Corp., Japan (28.88%)}	Korea	17.00	98.7	Electrolytic Copper Rods or Black Copper Rods (including Coils)	Rewari, Haryana	15.3
25.	20.7.96	Normandy Anglo Asian (I) Pvt. Ltd.	Normandy Anglo Asia Pty. Ltd., Malaysia	Malay.	0.48	100	Minerals: Mining Exploration activities.		
26.	12.9.98	Kama Srinivasa Rao, Hydserabad	Kashartha SDN BHD, Makaysia	Malaysia	0.74	74	Manufacture of Stone Aggregates		
27.	20.9.99	Inglewood Minerals Pvt. Ltd.,	Inglewood Holdings Ltd., Mauritius	Mauritius	5.00	100	Exploration in the Mining Sector	Rajasthan	12
28.	17.4.2000	Sterlite Industries India Ltd./ MALCO	Twinstar Holdings Ltd.	Mauritius	28.57	19/80	Tel. Cables, Optical Fibre, etc./ Primary Metal, Properzi rods rolled products, extrusions, alumina etc.	Maharastra/ Tamil Nadu	
29.	3.8.96	Dolphin Offshore Ltd.	Techy Investment B.C. Netherlands	Neth.	0.04	75	Minerals: Survey, research, analysis, assessment, etc.	TN, Chengai, MGR	
30.	18.4.98	Pasminco Exploration Pvt. Ltd.	Pasminco Netherlands (Holdings) B.V.	Net'lands	4.75	100	Base metals: Exploration and other activities, etc.		
31.	18.7.2000	Hydro Alum. Extrusions Bldg.	Norsk Hydro Holland B.V.	Net'lands	5.00	100	Manufacture of Aluminium and building	Karnataka, Bangalore	5

S.No.	Date	Indian Co	Foreign Co	Country	Equity INR (Rs. Cr.)	Equity %	Activity	Location	FC Inflow
32.	20.6.2001	System (I) Ltd. American Exploration (India) B.V.	American Exploration (India) B.V.	Net'lands	23.75	74	materials Exploration, Mining, mineral processing.		
33.	20.6.98	Utkal Alumina International Pvt. Ltd.	Hydro Aluminium/Alca n Aluminium	Nor/Can	13.80	60	Alumina: Production of Alumina & Al. Oxides	Ori., MP & AP	12.27
34.	11.7.98	Orissa Extrusions Ltd.	Hydro Aluminium/	Norway	6.40	31.67	Aluminium: Manufac of Bars, Rods, Wire, Tubes & Pipes	Ori.	
35.	31.8.96	Monnet International Ltd.	Polservices Foreign Trade Enterprises	Poland	0.10	49	Technical Consultancy: geology, etc.		
36.	25.10.97	De Beers India Surveys Pvt. Ltd.	De Beers Mauritius Pvt.Ltd.	SA	142.50	100	Diamonds: Exploration/Prospectin g.		0.76
37.	18.10.96	De Beers India Prospecting Pvt. Ltd.	De Beers Mauritius Pvt.Ltd.	SA	142.50	100	Diamonds: Prospecting and mining.		1.72
38.	24.10.98	De Beers India Minerals Pvt. Ltd.	De Bears Mauritius Pvt. Ltd.	SA	142.50	100	Exploration/Prospectin g of diamonds and other minerals		
39.	25.2.95	De Beers India Manag.Serv. P. Ltd	De Beers Consolidated Mines Ltd.	SA		100	Technical Consultancy Services.		2.36
40.	6.3.99	De Beers Adamas India Pvt. Ltd.	De Beers Consolidated Mines Ltd.	SA	142.50	100	Diamonds: Prospecting/ Exploration		
41.	8.5.2000	De Beers India Exploration Pvt. Ltd.	De Beers Consolidated Mines Ltd.	SA	147.50	100	Diamonds: Prospecting/ Exploration		
42.	21.6.97	Gold Fields Guernsey	Gold Fields Guernsey Ltd., South Africa	SA	118.75	100	Gold: Exploration and mining.		
43.	12.4.2001	Anglovaal Mining India Pvt. Ltd.	Anglovaal Mining Ltd., South Africa	SA	5.00	100	Exploration for precious and base metals		
44.	26.2.98	Meta Strips Limited.	SDIYCM, Inc. and 3 other US Cos.	Spain	24.80	31	Base Metals: Copper cathode, zinc, etc. from scrap.		24.59
45.	31.8.96	Fimex Metal Refiners Pvt. Ltd.	NRIs	SPore	3.00	100	Base metals: Recycling TN, Chengai, cu, al, pb, zn etc. from MGR scrap.		
46.	27.12.95	Almetal Recyclers Ltd.	Mr. Chine Joo Hai, Singapore	S'pore	0.34	45	Base metals: Recycling TN, Ambattur of non-ferrous metals like Cu., Al, etc		
47.	6.6.98	SWIL Ltd.	Boliden Contech AB, Sweden	Sweden	4.50	5.31	Base Metals: Copper Cathode manufacture	Gujarat, Jhagadia	
48.	18.4.98	Kanthal India Ltd.	Kanthal A.B., Sweden.	Sweden	4.73	57.43	Electrical resistances, bimetal strips, etc.	TN, Hosur	4.73
49.	24.8.96	Jey Jeth Granite Products Ltd.	Sunmin Marble Co. Ltd., Taiwan.	Taiwan	1.00	41.66	Dimensional Blocks: Mining of dimensional blocks, etc.	AP, Karimnagar	

S.No.	Date	Indian Co	Foreign Co	Country	Equity INR (Rs. Cr.)	Equity %	Activity	Location	FC Inflow
50.	19.7.96	Rio Tinto India Pvt. Ltd.	Rio Tinto Minerals Development Ltd.	U.K	57.00	100	Technical Consultancy and other services	Delhi	46.2
51.	6.9.93	Metdist Industries Ltd.	METDIST LTD., UK	UK	408.00	60	Base Metals: Copper smelter and refinery project.	Gujarat	20.21
52.	13.8.96	Rio Tinto Orissa Mining Ltd.	Rio-Tinto Minerals Development Ltd.	UK	52.25	51	Development of Iron ore project in Orissa.	Orissa, Keonjhar Dist.	14.5
53.	18.10.96	U.P. Hepworth Pvt. Ltd.	Hepworth Minerals & Chemicals Ltd., UK	UK	5.87	51	Mineral Sands: Beneficiation of silica sands.	UP, Allahabad	
54.	8.8.96	Oxide India Pvt. Ltd.	VAM Ltd., UK	UK	0.01	13.81	Alumina: Man of high & low alumina bed support, catalyst carrier	WB, Burdwan	
55.	10.1.98	Cookson India Limited.	Cookson Group Inc., UK	UK	13.97	98.17	Raw material for alkaline batteries.		
56.	25.10.99	Joy Mining Machinery India Ltd.	Joy Mining Machinery Ltd., U.K.	UK	0.03	60	Manufacturing of Mining and Material handling equipments.	WB, Calcutta	0.03
57.	13.12.99	M/s BPB Holdings India Pvt. Ltd.	M/s BPB India Ltd., U.K.	UK	57.60	100	For setting up of a WOS for downstream investment upto 74% in Gypsum based projects.		23.52
58.	11.12.2000	Phelps Dodge - Metdist Mining India P. Ltd.	Phelps Dodge Exploration Corporation, USA & Metdist Ltd., UK	UK & USA	47.50	100	Exploration, development, mining and processing of base and precious minerals	Rajasthan	
59.	5.1.96	Indian Barytes & Chemicals Ltd.					Baryte: Beneficiation of AP, low grade Baryte Ore	Cuddapah	
60.	10.11.95	Finolex Essex Industries Ltd.	Essex Group Inc. USA (Tech. Collaboration)	USA			Base metals: Continuous copper rod manufacture	Goa	
61.	30.6.94	GMDC / Gujarat Alkalies & Chemicals Ltd.	Ambassador Group Inc. and Jefferies & Co	USA	66.00	17	Alumina: Manuf.of calcined fused alumina, Power, etc.	Gujrat, Kutch	
62.	24.1.97	Gujarat Aluminium & Bauxite Ltd.	Raytheon Engineers & Constructions Inc.	USA	162.80	22	Aluminium: Manufac of alumina, aluminium compounds, coke, etc.	Gujrat, Kutch	
63.	3.8.96	Isrim Stones India Ltd.	Rimtech Corporation	USA	2.00	10	Stone: Manuf.of composite stone and veneer panels	Kar, Belgaum	
64.	21.12.96	Transworld Garnet India Pvt. Ltd.	Transworld Garnet Co., USA	USA	10.50	100	Mineral Sands: Prospecting of mineral sands.	TN, Tuticorin	3.89
65.	9.8.97	Phelps Dodge	Phelps Dodge	USA	71.25	100	Base Metals: Expl,		0.8

S.No.	Date	Indian Co	Foreign Co	Country	Equity INR (Rs. Cr.)	Equity %	Activity	Location	FC Inflow
66.	1.2.97	Exploration India Pvt. LTD Ashapura Volclay Pvt. Ltd.	Exploration Corporation Volclay International, USA	USA	0.50	50	mining, smelting of cu, znc & ni Bentonite: Manuf. & mkting of value added Bentonite.	Bhuj Distt. Gujarat	0.39
67.	9.4.2001	Entraco Metals Pvt. Ltd.	NRIs	USA	0.20	40	Manufacture of cobalt powder	Maharastra Nasik	
68.	30.1.96	Geotech Pvt. Ltd.	Dr. Marshall Silver	Vietnam	0.03	30	Technical Consultancy services in geo-technology		
69.	24.4.92	Larsen & Toubro Ltd. (Rayakal Alum. Co. Ltd.)	To be identified		164.00	25	Alumina.	Ori, Raigad	
70.	13.3.99	Everlast Engineering Ltd.,	Alvan BVBA	Belgium	0.10	50	Aluminium Extrusions and Alupan Kits	Thane, Mah	
<b>GRAND TOTAL</b>					<b>3963</b>				<b>247.11</b>



# List of abbreviations

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AITUC	All India Trade Union Congress
BALCO	Bharat Aluminium Company Limited
BGML	Bharat Gold Mines Limited
BMS	Bharatiya Mazdoor Sangh
CAGR	Compounded Annual Growth Rate
CASS	Chotanagpur Adivasi Sewa Simiti
CIL	Coal India Limited
CITU	Centre of Indian Trade Unions
CMPDI	Central Mine Planning and Development Institute
CSESMP	Coal Sector – Environmental and Social Mitigation Project
CSO	Central Statistical Organisation
CSR	Coal Sector Rehabilitation Project
DGMS	Director General of Mine Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environment Protection Act
FCA	Forest Conservation Act
FDI	Foreign Direct Investment
FIPB	Foreign Investment promotion Board
GACL	Gujarat Ambuja Cements Limited
GDP	Gross domestic product
GIS	Geographic information systems
GOI	Government of India
GSI	Geological Survey of India
HCL	Hindustan Copper Limited
HINDALCO	Hindustan Aluminium Company
HMS	Hind Mazdoor Sabha
HZL	Hindustan Zinc Limited
HZL	Hindustan Zinc Limited
IBM	Indian Bureau of Mines
ILO	International Labour Organisation
INDALCO	Indian Aluminium Company
INTUC	Indian National Trade Union Congress
IPDPs	Indigenous people development plan
JBCCI	Joint Bipartite Committee for the Coal Industry
JOAR	Jharkhandi Organisation Against Radiation
LAA	Land Acquisition Act
MALCO	Madras Aluminium Company

## Abbreviations

MCR	Mineral Concession Rules
MECL	Mineral Exploration Corporation Limited
MGMI	Mining Geological and Metallurgical Institute of India
ML	Mining lease
MM(R&D) Act	Mines and Minerals (Regulation and Development) Act
MoEF	Ministry of Environment and Forests
MoM	Ministry of Mines
MRTP Act	Monopolies and Restrictive Trade Practices Act
NALCO	National aluminium Company Limited
NFITU	National Federation of Indian Trade Unions
NGO	Non-Governmental Organisation
NLC	Neyveli Lignite Corporation Limited
NLO	National organisation of labour
NMDC	National Mineral Development Corporation
PAP	Project affected people
PL	Prospecting lease
PPCL	Pyrites, Phosphates and Chemicals Limited
PSUs	Public Sector Undertaking
PWD	Public Works Department
R&R	Rehabilitation and Resettlement
RAPs	Rehabilitation action plan
SAIL	Steel Authority of India Limited
SC	Scheduled Caste
SHGs	Self help groups
ST	Scheduled Tribes
UN	United Nations
UTUC	United Trade Union Congress
WB	World Bank
WFTU	World Federation of Trade Unions

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