



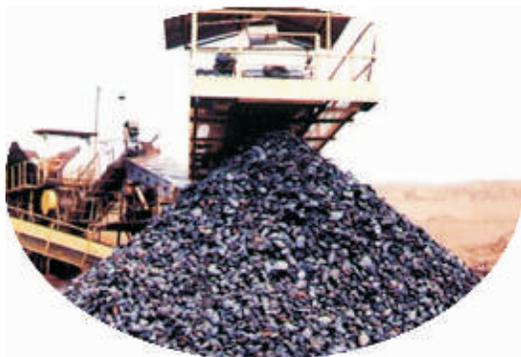
Confederation of Indian Industry

INDIAN MINING SECTOR

Opportunities & Challenges



Knowledge Partner



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Author	Strategic Initiatives & Government Advisory (SIGA) & Corporate Finance Team.	
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Contact Address	<p>Confederation of Indian Industry</p> <p>H.No. 1-11-252/9, Plot no. 7, Regal House, Motilal Nehru Nagar, Begumpet, Hyderabad - 500 016 Tel: +9140 27765964/66/67 Fax: +9140 27766116 Website: www.cii.in</p>	<p>YES BANK Ltd</p> <p>Registered and Head Office 9th Floor, Nehru Centre, Dr. Annie Besant Road, Worli, Mumbai-400018, INDIA Tel: 91-22-6669900 Fax: 91-22-25974088</p> <p>Strategic Initiatives & Government Advisory, & Corporate Finance Tel: 91-11-46029000</p>
For Further Information	<p>cii.hyderabad@cii.in</p>	<p>tushar.pandey@yesbank.in</p>

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Mining in India - Challenges & Opportunities

1. Indian Mining Industry: An Overview

Minerals are one of the most valuable, finite and non-renewable natural resources of any country. They constitute the vital raw materials for many basic industries and are a major resource for economic development. India is endowed with huge resources of many metallic and non-metallic minerals and the sector is an important segment of the economy, which contributed around 2.36% in the National GDP at 2004-05 prices for the year 2010-11. Since independence, there has been a pronounced growth in the mineral production both in terms of quantity and value. The country currently produces as many as 87 minerals, which include 4 fuels, 10 metallic, 47 non-metallic, 3 atomic and 23 minor minerals (including building and other materials). This wide availability of the minerals in the form of abundant rich reserves made it very conducive for the growth and development of the mining sector in India.

1.1 Contribution to Economy

The Mining & Quarrying Sector has a share of about 2.36% in the National GDP at 2004-05 prices for the year 2010-11 and has grown by 6.2% over the previous year. The advance estimates of GDP (at current prices) for the year 2010-11 in respect of mining and quarrying sector is accounted for 2.51% of GDP. The contribution of mining and quarrying sector to GDP for the year 2010-11 is estimated at Rs. 182,278 crore which would indicate an increase of 18.2% over that in the previous year.

Figure 1: Mining Industry GDP Growth Rates (2004-05 prices)

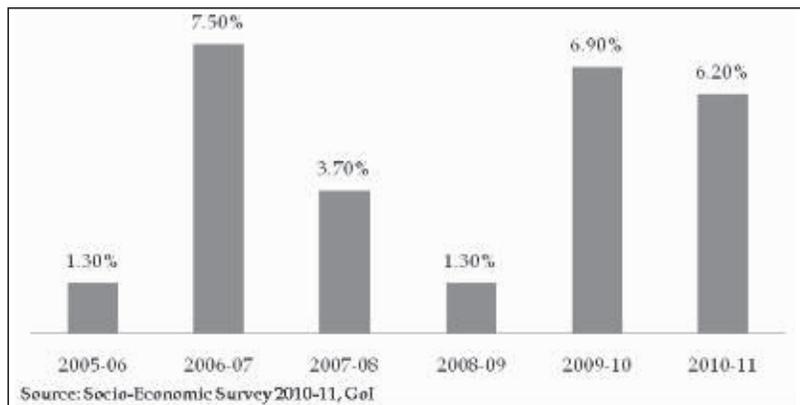
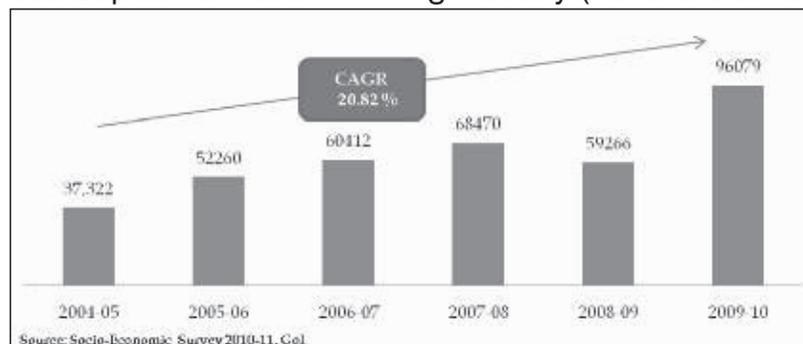


Figure 2: Gross Capital Formation - Mining Industry (Rs. Crore at 2004-05 prices)

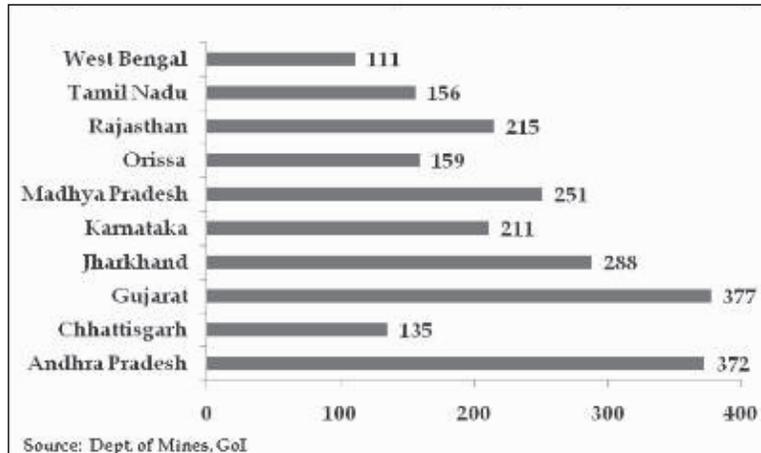


The industry sector has been attracting a sizeable chunk of domestic capital formation resulting in an addition to productive capacities. Within the industries sector, Mining industry has grown at a CAGR of 20.82%, as compared to Manufacturing (10.35%) and Electricity (13.16%).

1.2 Distribution of Mines

Indian mining industry is quite unique with the presence of a large number of small operational mines. By the year 2010-11 there were about 2628 operational mines excluding minor minerals, petroleum, natural gas and atomic minerals, of which just 11 states together account for 91.97% of total operational mines.

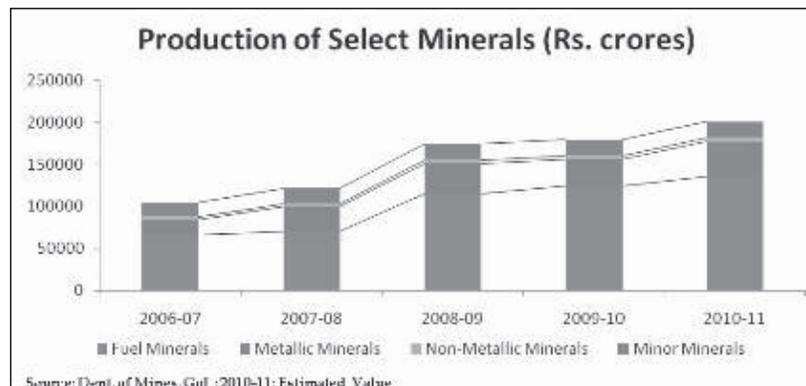
Figure 3: Distribution of Operating Mines (2010-11)



1.3 Mineral Production

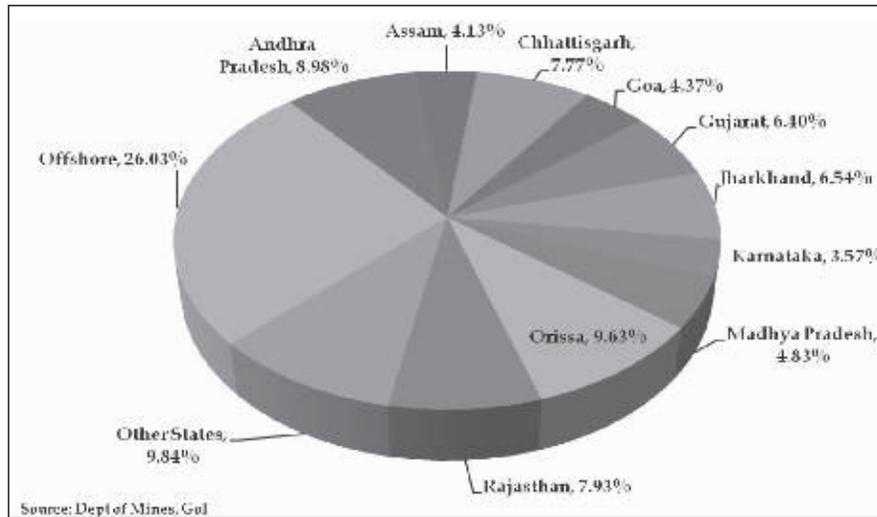
Massive expansion of exploration activities have taken place since Independence which led to India emerging as a significant player in the world mineral production. Today India is third largest producer of chromium ores, with a share of 18% in world production, fourth largest producer of iron ore with a share of 10% in global production, fifth largest producer of manganese ore with a share of 7% share and sixth largest producer of bauxite, zinc, and titanium with a share of 7%, 5% and 5%, respectively.

Figure 4: Production of Select Minerals (Rs. Crore)



The production value of Fuel-based minerals such as Coal, Lignite, Natural Gas & Petroleum has been increasing year-on-year.

Figure 5: State-wise Mineral Production by Value Added (2010-11)

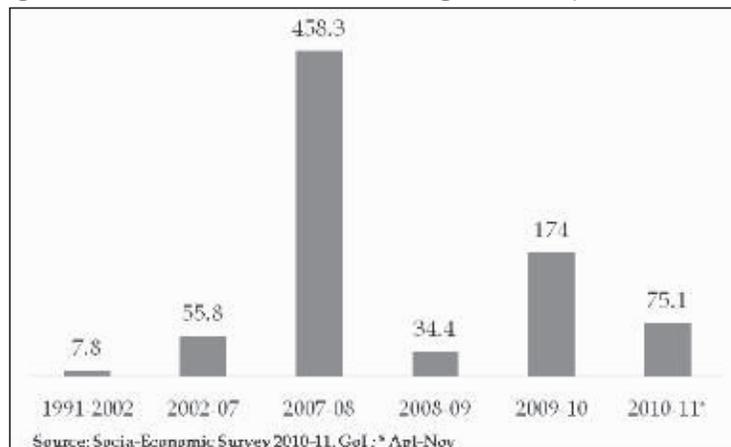


During the year 2010-11, the value of mineral production in most of the mineral producing States has increased as compared to the previous year, except for some states where there has been a decrease in mineral production.

1.4 Foreign Investment & Trade

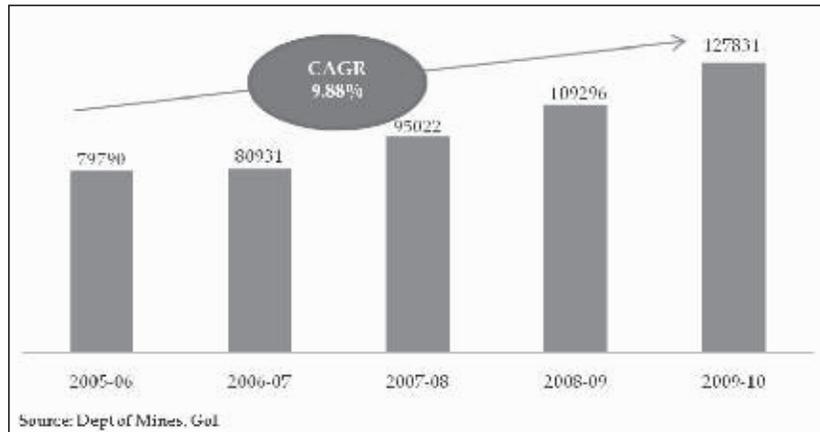
The Indian mining sector was opened to both domestic and Foreign Direct Investments (FDI) in 1993 to encourage private investment into the sector and infuse funds, technology and managerial expertise. At the initial stages proposals were considered on a case-to-case basis. However since 1997 the automatic approval route for FDI was opened and there have been further liberalization over the years. 100% FDI is permitted in coal and lignite mining for captive consumption and the creation of infrastructure for marketing of petroleum and natural gas sectors. FDI is also allowed upto 100% for the exploration & mining of diamonds, gold, silver and other precious stones. Since April, 2000 the sector has attracted FDI inflows of USD 478 million.

Figure 6: FDI Inflows in to Mining Sector (USD Millions)



India's mineral exports have grown at a CAGR of 9.88% and have reached a provisional figure of Rs. 1,27,831 crore for the year 2009-10. Diamonds (mostly cut) formed the principal item of export during 2009-10 accounting for 66.24%, however since India is net importer of diamonds it does not add much value to our mineral exports. Among the minerals which are mined in India and exported, Iron Ore contributed about 22.19% to the total value of exports, followed by Granite (3.91%) and alumina (0.75%), Precious and semi-precious stones (0.76%), Chromites (0.63%), Emeralds (0.38%) and Lead ores and conc. (0.19%).

Figure 7: Exports of Ores & Minerals (Rs. Crore)



In order to promote exploration of mineral resources within India and by Indian companies in other countries, the Ministry of Mines & Department of Natural Resources, Govt of India has entered into various international co-operations.

2. Investment Opportunities & Challenges

Products of the Indian mining sector consist of coal, lignite, limestone, iron ore, bauxite, copper, lead, zinc, and many more and are contributed by over 2628 mines located all over the country. Productions from open cast mines account for more than 80 per cent of the total mineral production in the country.

Indian coal sector, which consists of 80% of Indian mineral sector, is likely to witness significant investment growth rate in the next 5 years. The current production of over 450MT is envisaged to go to over 600MT in next couple of years leading to an investment to the tune of Rs 50-60000 crore (US \$15 B) which will give opportunities to mining equipment supplier, related maintenance provider and contract miners and service providers. This will further lead to increased opportunity of at least over Rs 4000 crore yearly business opportunity in contract mining area for operation of the mines in private sector. The Government intends to augment the coal production with private participation. It has identified coal blocks for exclusive mining under private sector and captive purpose. There is ample scope to tap 16584 million tons of coal reserves for development of coal based thermal plants, washeries, gasification and carbonization plants.

India has an estimated 123 billion tons of recoverable mineral reserves remaining to be exploited (excluding fuel, atomic and minor minerals). Besides coal, oil and gas reserves, the mineral inventory in India includes 13,000 deposits/prospects of 61 non-fuel minerals (including 4 of the minor minerals). Expenditure outlay on mining is a meager sum when compared to other markets and the investment gap is most likely to be covered by the private sector. The Indian Policies related to Mining Sector welcomed joint ventures between foreign and domestic partners to mobilize finances and technology and secure access to global markets. Potential areas for exploration ventures include gold, diamond, copper, lead-zinc, nickel, cobalt, molybdenum, lithium, tin, tungsten, silver, platinum group of metals and other rare metals, chromites and manganese ore, and fertilizer minerals.

Most of the minerals in India occur in the peninsular plateau region in the old crystalline rocks. Minerals are generally concentrated in three broad belts in India. These belts are:

- 1. The North-Eastern Plateau Region:** This belt covers Chotanagpur (Jharkhand), Orissa Plateau, West Bengal and parts of Chhattisgarh. Major iron and steel industry are located in this region. It has variety of minerals viz. iron ore coal, manganese, bauxite, mica.
- 2. The South-Western Plateau Region:** This belt extends over Karnataka, Goa and Tamil Nadu and Kerala. This belt is rich in ferrous metals such as iron ore and manganese. Bauxite and limestone are also found. Coal deposits are low. Kerala has deposits of monazite and thorium.
- 3. The North-Western Region:** This belt extends along Aravali in Rajasthan and part of Gujarat. Copper and zinc are major minerals. Rajasthan is rich in building stones i.e. sandstone, granite, marble. Gujarat is known for its petroleum deposits.

4. Other regions:

- a. The Himalayan belt is another mineral belt where copper, lead, zinc, cobalt and tungsten are known to occur. Assam valley has mineral oil deposits.
- b. Mumbai High has rich oil resources in off-shore-areas.

So while India is abundant in a lot of minerals, there are some specific opportunities that exist in the mining sector that need to be tapped into for India to become powerful in the mining space. The main opportunities in the mining sector (excluding coal and industrial minerals) are in the development and production of surplus commodities such as iron ore and bauxite, mica, potash, few low-grade ores, mining of small gold deposits, development of placer gold resources located on the frontal belt of the Himalayas, mining the known deposits of economic and marginal categories, such as base metals in Bihar and Rajasthan and exploitation of laterite for nickels in Orissa, Molybdenum in Tamil Nadu and tin in Haryana. Considerable potential also exists for setting up manufacturing units for value added products.

There exists considerable opportunities for future discoveries of sub-surface deposits with the application of modern techniques. Our need to continue developing environmental plans and management systems to meet these challenges has led India to create a responsible global player in the world of mining. Indian companies like ONGC, GAIL, RNRL, REL, CIL Adani, Welspun, Mittal and Jindal steel are already active in the oil & gas and mining space. RIL and BHEL are aggressively prospecting opportunities in the non-renewable energy domain.

Some other specific opportunities that exist in the mining sector include establishment of joint ventures with foreign firms to develop virgin mine properties, exploration and adoption of clean technologies such as coal bed methane extraction, coal gasification and coal-to-liquid projects. In the nation's efforts to control emissions and cut down on pollution, greater need and hence opportunity for operation of coal beneficiation plants and underground mines exists.

There is also the opportunity for increased private sector participation and FDI in joint ventures for investment of mineral exploration, exploitation and development of mineral resources. There also exist backward linkage opportunities in the form of required infrastructure creation and maintenance, logistics, training institutes and trainers and similar institutions that support the development of mining.

With the restriction on mining due to environmental considerations with respect to opencast mining, there is huge scope across the country for underground mining. This is an eco-friendly option that would permit mining without disturbing the flora and fauna. However, parameters like depth cover, surface/sub-surface constraints, multi-seam mining, steepness, contiguity and thickness of the seam are becoming more important with changing geo-mining conditions of the mines. Another challenge is that the thick and steep seams encounter instability problems mainly due to sliding movement. Other challenges in the form of poor mechanization and automation exist including complex rock mass behavior and problem of gas accumulation.

Opportunities exist by way of mineral exploration projects in some of the most lucrative fields like diamonds, gold, beach sand, base metals, limestone, bauxite, granite etc. Andhra Pradesh alone has the scope for establishing two to three alumina and aluminum industries, a beach sand separation plant, and production of titanium and establishment of downstream industries. Andhra Pradesh can also explore the possibility of opening up diamond mines and reviving the gold mines in Kurnool district and sponge iron plants in Anantapur, Kurnool, Krishna, Karimnagar, Warangal, Nalgonda, Prakasam and Khammam districts.

To summarize, the following opportunities exist in the mining sector in India:

Minerals: Coal, Iron ore and bauxite, mica, potash, few low-grade ores, mining of small gold deposits, development of placer gold resources, base metals, laterite for nickels, aluminum, tin, diamond, copper, lead-zinc, nickel, cobalt, molybdenum, lithium, tin, tungsten, silver, platinum group of metals and other rare metals, chromite and manganese ore, and fertilizer minerals.

Technology: Exploration of underground mining as an environment-friendly substitute for open cast mining as well as exploration and adoption of clean technologies

Players: Increased private sector participation and FDI in joint ventures for investment of mineral exploration, exploitation and development of mineral resources.

Supporting & Related Sectors: Infrastructure creation and maintenance, logistics, training institutes and trainers and similar institutions that support the development of mining

Forward & Backward Linkage: There is huge scope for the manufacturing of mining equipment itself in India- mobile crusher, jaw crusher, impact crusher, cone crusher, hammer crusher, VSI crusher, powder machine, high pressure hanging roller mill grinding machines, high pressure Powder Mill etc. Considerable potential also exists for setting up manufacturing units for value added products.

While India abounds with mining opportunities across most regions, there are also some inherent challenges that act as deterrents to the successful take off of the sector and India emerging as a mining giant.

Technological Challenges: One of the major challenges faced by the industry is technology. Most of the mining firms in India still fall under the public sector domain, and require technology infusion. The equipments being used in most of the units are outdated, which lead to lower productivity and diseconomies of scale.

Infrastructure Bottlenecks: Inadequate infrastructure, both onsite and off-site, remains another bottleneck in the growth of Indian mineral sector.

Inadequate Investment: The mining sector has not attracted major investments despite liberalization of this sector for private and foreign investments. Apart from right policy initiatives, challenges associated with land acquisition, onsite infrastructure development and transportation systems are acting as deterrent to investment in this sector.

Another fallout is the insufficient knowledge-base about mining resources, mainly due to inadequate funds for exploration activities. In addition, there is an urgent need to update and revamp the Indian mining sector in the overall context of the changing nature of the world mining industry, especially with regard to the regulatory regime that are being adopted in other parts of the world.

Limited Entry of Private Sector & FDI:

Entry of private players and FDI has been limited and is subjected to a number of restrictions. For example, private sector players are allowed to invest only in captive coal mining and cannot sell any production to third parties. As a result, foreign direct investment (FDI) in Indian mining and metals industry has remained insignificant. This has left the mining sector seriously untapped.

Insufficient Budget for Exploration Activities:

The vast pool of mineral resources in the country is still very much untapped due to inadequate exploration initiatives. It is estimated that in the last 50 years, the total amount spent by Geological Survey of India on mineral search is about Rs. 500 crore only, and of this, as much as Rs. 350 crore has been spent on coal exploration; thus highlighting the lack of exploration initiatives with respect to the other minerals that India has in abundance.

Environmental Issues:

Mining activities involve various phases such as exploration and development, extraction, processing, transportation and trans-shipment. Each of these phases involves specific activities that can adversely affect environment. The impact of mining activities on pollution of air, water, land, soil quality, vegetation including forest eco systems, and on human health and habitation has become a matter of serious concern. Some of the negative impacts on the landscape and the human environment can effectively be permanent. The expenses associated with mitigating such challenges are significant.

Social Challenges:

Social unrest happens in the absence of responsible mining activities. In many parts of the country, mining activity is often undertaken without the consent of the local people. Responsible mining practices should include paying due regard to cultural circumstances of the local people and loss of access to common resources.

Inadequate Database on Mineral Concessions:

Industry sources feel that there is inadequate information about areas available for different types of mineral concessions in India. Such inadequacy in information-base also acts as a deterrent for potential investors.

Other Challenges:

Another challenge includes the lack of level playing field, especially in sectors with PSU dominance. Delays and difficulties in allotment of mining leases and land acquisition have acted as a huge impediment for the entry of private players. Bureaucratic delays, discretionary interpretation, vested interest, bias and subjective practices have kept the private players at bay.

Other challenges include inflexible labor laws and high cost implementation of mining operations. Administered pricing mechanism that is practiced in India often results in distortions in pricing and unpredictable returns.

3. Andhra Pradesh: A Mining Destination

Minerals form a major resource and contributor to the economic growth for the state of Andhra Pradesh. The State is renowned as the mineral store house of the south and has established itself as a prime mineral producer in the country. It is the second largest storehouse of mineral resource in the country with about 42 industrial mineral deposits and vast resources of building materials. The State has vast explored resources of coal, limestone, bauxite, barites, mica, beach sands, granite, limestone slabs etc., and good resources of oil and natural gas, manganese, asbestos, iron ore, ball clay, fireclay gold, diamond, graphite, dolomite, quartz, tungsten, steatite, feldspar, silica sand, Uranium, beach sands minerals. etc. It is also endowed with the internationally known black, pink, blue and multicolored varieties of granites.

3.1 Current Status

Almost all minerals are produced in the state and the principal minerals include coal, natural gas (utilized), iron ore, limestone, petroleum (crude) and barites which together account for about 47.19% of total value of mineral production, of which Coal alone contributed 32.73% to the total value of mineral production. The State is also a leading producer of minerals such as chrysotile asbestos, mica, feldspar, vermiculite, quartz, laterite, silica sand and dolomite. It currently accounts for 94% barytes, 63% ball clay, 61% corundum, 40% diamond, 39% calcite, 28% mica, 26% garnet, 23% ilmenite, 20% limestone and 15% dolomite resources of the country.

The total value of mineral production in the state for the year 2009-10 stood at Rs. 19258.15 crore, an increase of 1.62% from the previous year. The sector itself has contributed about Rs.1970.79 crores as revenue to the State Government in year 2009-10. The State stands first in generating mineral revenue to the Government. Andhra Pradesh has immense mineral value and offers various opportunities to the mining sector.

3.2 Potential for Future Ventures

Andhra Pradesh has the potential of being India's cement and granite powerhouse and is already a dominant producer of coal in South India. It produces about 100 to 110 million tons of industrial minerals and 200 million cubic meters of dimensional stones and building material every year and stands first in Barytes and Limestone production in the country. The growth in mineral production in the state is being driven by an increased local consumption from various industries that are involved in mineral-based products.

The State Government has identified specific minerals to drive future growth of the sector and is offering opportunities for exploration projects in most lucrative fields like Diamonds, Gold, Beach Sands, Base Metals, Limestone, Granite etc. The State Government had already granted reconnaissance permits over an area 56400 sq.kms for exploration of various minerals.

Diamonds: Diamonds are found in many areas covering about 5.00 million hectares in nine districts with an average incidence of 3 to 4 carats per 100 tons of source material. The Government has already granted reconnaissance permits for aeromagnetic surveys over 3.00 million hectares in the State.

Gold: Gold bearing areas fall in 11 districts of the State with an average incidence of 3 to 5 grams/tonne of source material. The Government has granted reconnaissance permits for exploration.

Beach Sands: Found all along the east coast right from Srikakulam in the north to Nellore district in the south constituting 20 percent of ilmenite, rutile and monazite and with a proven reserve of 32 million tonnes in some areas of Visakhapatnam districts.

Bauxite: Huge reserves of around 700 million tons of metal grade bauxite deposits are proven in Visakhapatnam and East Godavari districts.

Barytes: The single largest deposit in the world is located at Mangampet in Cuddapah district with a reserve of over 67 million tons.

Granite: The world-renowned black galaxy granite, Srikakulam blue, Warangal and Khammam black, Tan Brown of Karimnagar, Tiger Skin of Chittoor etc. occur in plentiful quantities. Granite worth about Rs.3000 million (US \$ 60 million) is being exported. There are significant opportunities for making novel products with polished granite, which have a good demand in the international market.

Ceramics: Andhra Pradesh is the largest source of various clays, feldspar, quartz, and silica sand rich in rare earths like titanites, zirconites etc. The conventional ceramic industry in the State provides a strong base for development of advanced ceramics like electro and mechano ceramics with private sector investment.

Coal: Andhra Pradesh, being the only producer of coal in the entire South India, produces around 30 million tons annually. The estimated reserves are 13,021 million tons.

Limestone: The State contains 34 per cent of the country's limestone reserves with estimated reserves of 30,400 million tons. Exploitation of limestone for cement manufacturing can form a strong base for the establishment of cement plants to cater to the needs of the construction industry. The accelerated demand in the housing and infrastructure sectors in the country indicate a need for establishing modern cement plants in the State.

Oil and Natural Gas: Rich reserves of oil and Natural Gas occur over 4.5 million hectares in Krishna-Godavari basin. There is vast scope for increasing the production by intensive exploration and development of infrastructure to meet the growing demands in the domestic and industrial sector. The production Krishna-Godavari basin areas of the State have emerged as new promising areas for hydrocarbons-specially natural gas.

3.3 Policy Support & Incentives

After delegation of powers to the State Directorates of Mines and Geology by the Government of India, the Andhra Pradesh Government has established a *Mine Plan Cell* to scrutinize and approve the mine plans received from private investors. The State Government has focused considerably on creating an inventory of mineral resources, through key policy amendments and strategies, in tune with the National Mineral Policy for accelerating the growth and the overall development of the mining sector. The main aim of State Mineral Policy is to serve as a guiding force to translate the State's mineral potential into reality, ensuring environmental sustainability and social responsibility.

Government is constantly encouraging new entrepreneurs to ground Mining and Mineral Projects through effective implementation of Government policies and quick disposal of Mineral Concession Applications. This progressive strategy of the Government has led to growth in the number of new leases, mineral production, mineral value and the establishment of mineral-based industries.

Applications for the disposal of Mineral Concessions have been given utmost importance and often cleared in a pre-fixed time frame of 3 months. State's Department of Mines takes the initiative of getting clearances from Revenue Department to ease the process mineral concessions. The Department has disposed 8547 Mineral Concession applications in the year 2008-09 and 10140 in the year 2009-10, 3791 in the year 2010-11 upto September 2010.

To keep a check on the growth of illegal mining in the State, the Government has created a Task Force and instituted specific rules to prevent illegal mining, transportation and storage of minerals. As part of this drive, amendments were made to Andhra Pradesh Water, Land and Trees Act, 2002, prohibiting sand mining in overexploited areas to ensure environmental sustainability.

4. Critical Factors Influencing the Competitiveness of Indian Mining Industry

4.1 Conducive Policy Framework

Mining is a three-stage operation, involving regional exploration, detailed exploration, and actual mining. Generally mining projects have long gestation period requiring large investments in exploration and other development activities before commercial production can begin, and are thus considered as a high risk venture for a prospective miner. Therefore having favorable policies and regulations will be beneficial for the overall growth and sustainability of the sector.

Government of India had approved the new National Mineral Policy, 2008 to streamline and simplify the procedures for granting of mineral concessions and developing a sustainable framework for optimum utilization of the country's natural mineral resources for the industrial growth in the country and at the same time improving the life of people living in the mining areas which are generally located in the backward and tribal regions of the country. The Government is offering a wide range of concessions to investors in India, engaged in mining activity. The main concessions include:

Direct Taxes:

- Mining entities in specified backward areas are eligible for a complete tax holiday for a period of 5 years from commencement of production and a partial tax holiday thereafter.
- Environment protection equipment, pollution control equipment, energy saving equipment and certain other equipment eligible for 100% depreciation.
- One fifth of the expenditure on prospecting or extracting or production of certain minerals during 5 years ending with the first year of commercial production is allowed as a deduction from the total income.
- Export profits are eligible for the concessions under the Income Tax Act.

Indirect Taxes:

- Minerals in their finished form exempt from excise duty.
- Low customs duty on capital equipment used for minerals; on nickel, tin, pig iron, unwrought aluminum.
- Capital goods imported for mining under EPCG scheme qualifies for concessional customs duty subject to certain export obligations.

Financial support for Mining:

- Innovative financing schemes like metal loans, mezzanine financing, etc. designed for foreign firms and JV companies.

Large Area Prospecting:

- To boost exploration and detailed prospecting of high value and scarce minerals, the area for prospecting has been increased from 25 sq.km to 5,000 sq.km for a single license, and 10,000 sq.km for aerial prospecting.

Institutional Framework:

- The Ministry of Mines regulates and promotes the activities of mining in the country and is responsible for:
 - Surveys and exploration of all the minerals, other than coal, natural gas, petroleum and atomic minerals.
 - Mining and metallurgy of non-ferrous metals like aluminum, copper, zinc, lead, gold, and nickel.
 - Providing administration for prospecting and mining laws.
- The Mines and Minerals Development and Regulation Act (MMDR) and the Mines Act which constitute the basic laws governing the mining sector are promulgated by the Central Govt. The relevant rules in force under the MMDR Act are the Mineral Concessional Rules, 1960, outlining the procedures and conditions for obtaining a prospecting license or a mining lease, and the Mineral Conservation and Development Rules, 1988 that lay down the guidelines for ensuring mining on a scientific basis and without environment degradation. All the major minerals come under the purview of the Central Government. Minor minerals are separately notified and come under the purview of State Governments, who have formulated Mineral Concessional Rules for this purpose.
- In the federal structure, the State Government is the owner of minerals in their respective territorial jurisdiction. In offshore areas, exclusive economic zone and the continental shelf, the rights are vested in the Central Govt.
- High quality geological databases have been generated by national agencies like the Geological Survey of India, Mineral Exploration Corporation, National Remote Sensing Agency, National Geophysical Research Institute and Indian Bureau of Mines. This database is accessible on a commercial basis and makes investment in mining exploration in India a low-risk investment proposition. In addition to the above, there exists a Federation of Mining Industries (FIMI) which is an association of all those engaged in the business of mining. FIMI from time to time suggests to the Govt. desired changes in the prevailing mining policy that would facilitate improved activities in the sector.

4.2 Development of Supporting Infrastructure

Unlike any other industrial project, a mining project has to be located at the place where the ore body lies and hence supporting infrastructure is critical. Typically it's the mine operator who first identifies the ore body, then locates the site where the mine is to be developed, and then builds the infrastructure needed to set up and operate the mine and evacuate the ore. In other words, the mine does not go to the infrastructure, the infrastructure has to come to the mine. The infrastructure needs of the mining sector can be classified into two categories. First, infrastructure needed to develop and operate a mine; and second, infrastructure needed to evacuate the mineral bearing ore to the processing site or port either as raw ore or as a value added product after the raw ore has been processed at or near the pit mouth.

A major part of the large-scale sector production is under captive mining, which have their own dynamics in terms of technology used and ore extracted as these are driven by the requirements of specific downstream units rather than by the economics of demand, supply, and prices in the industry as a whole. However, both in quantitative terms as well as in percentage terms, the share of the SME sector dominates across the board in the main minerals. If we leave aside captive mining, then in terms of production, area covered, and the number of leases, the SME sector far outweighs the large-scale sector.

India's rather antiquated exploration technology has thrown up a number of small deposits and these deposits are picked up by SME sector operators. The infrastructure problems of the SME sector in India are also unique to the Indian situation and require location-specific solutions. This is mainly due to the scale of their operation which does not permit miners to put up their own infrastructure. Therefore, SME sector mines usually tend to come up where some form of public infrastructure already exists. Since existing roads and railways are already overburdened, the needs of mining are difficult to satisfy and have to be met at the expense of other users. Where more than one SME sector operation comes up the existing infrastructure is put under strain. Mineral extraction activity could in such circumstances damage the infrastructure through excessive use, depriving other users for whom the infrastructure was created in the first place. It is necessary, therefore, that in infrastructure projects in areas where SME sector mining is significant the requirements of the miners are factored into the design of the projects. Stronger infrastructure is needed to withstand the load imposed on public utilities by the mines in the area. Presence of specialized infrastructure catering to the mining sector will decrease the unit cost of transportation by allowing higher volumes to be transported at one shot. By comparison, transportation by railways in Brazil costs about US\$ 3–4 per ton while the cost in India is Rs 800 per ton (about US\$ 18 per ton). Indian roadways at best can accommodate dumpers of 40–50 ton capacities, as compared to roads in Brazil and Australia which are designed for dumpers of upto 200 tons.

4.3 Financing Mining Projects

The industry is made up of very large, well-capitalized companies as well as medium and small companies; public companies which operate for profit and state-owned companies which are not always profitable. Some companies operate rich ore bodies while others have marginal operations. Regardless of the size and structure all mining companies require vast amounts of capital.

Natural resources companies have been evolving their financing needs and are moving from primarily equity-based financing (which obviously has a diluting effect for shareholders) to debt-based financing, in particular, via project financing. Successful project financing of mining and natural resources projects requires a number of specific issues to be considered.

The ability of a mining project to attract finance is often dependent on where it lies in the development cycle. The closer it is to the exploration stage the more likely it is that it will have to be funded with equity-the likelihood of it securing debt will increase the further it moves through the cycle towards development.

Equity is the most common type of capital for mining projects and no project is fully funded by debt finance regardless of how economically robust the project might be. In majority of cases the projects have a debt: equity ratio in the range of 30:70 to 60:40. Equity is usually sourced from private investors or through stock exchange listings and rights issues, or generated within the business.

Venture capital is an essentially equity that is provided in the form of a speculative investment. It is not normally intended to be permanent capital but injected into a company for a definitive period during which the investor would be looking for a substantial move in the share price before exiting the investment.

Quasi-equity is debt that is structured in such a way that it appears to be equity, and usually takes the form of convertible debt that can be converted to ordinary equity should its value increase due to movements in the share price. Quasi-equity is normally

subordinated to senior debt (in return for the option of converting it into equity), and has the effect of reducing the level of gearing as it is reflected as equity.

Generally the risk profile of a potential project is at its peak in the early stages and decreases with progression through the development phases. The risks at the early stages, usually up to the point where a pre-feasibility study ('PFS') has been completed, are normally beyond what typical commercial banks would be willing to expose themselves to. Selected banks however, have the appetite for this level of risk and where the PFS indicates a very strong project, they are prepared to provide funding for completion of the Bankable Feasibility Study ('BFS'). This is normally with the intention of securing the right to arrange the finance for the development of the project.

Development Phase	Type of Funding	Funding Sources
Prospecting	Equity	Shareholders
Initial Exploration	Equity	Shareholders
Advanced Exploration	Equity	Shareholders
	Venture Capital	Specialized Resource Funds
Pre-Feasibility Study	Equity	Shareholders
	Venture Capital	Specialized Resource Funds
	Quasi-Equity	Select Financial Institutions
Bankable Feasibility Study	Equity	Specialized Resource Funds
	Venture Capital	Select Financial Institutions
	Quasi-Equity	Select Financial Institutions
	Debt with Recourse	Commercial Banks
Construction	Equity	Shareholders
	Debt with Limited Recourse	Select Financial Institutions
Post-Commissioning	Equity	Shareholders
	Debt with no Recourse	Select Financial Institutions

Risks common to the mining industry can be characterized as:

Direct Risk - As countries tighten their environmental regulations and public concern about the mining industry grows, pressures increase on companies to minimize their environmental impacts and pay greater heed to local social issues. This may increase companies' capital and operating costs in order to comply with increased environmental regulations and social expectations. This can have an impact on cash flow and profitability, a borrower's ability to meet loan repayments and the value of the entire operation. It is therefore, important to thoroughly assess environmental performance as part of the normal credit appraisal process.

Indirect Risk - Legislation differs from country to country but many adopt the 'polluter pays' principle to pollution incidents. Financiers are increasingly concerned to avoid being placed in positions where they might be considered directly responsible for the polluting actions of their clients, in this case mining companies. Otherwise, in the case of a pollution incident, financial entities may find that not only have they lost the value of their original involvement in a particular project, but they may find themselves being forced to meet what may prove to be substantial clean-up costs or even further liabilities.

Reputational Risk - Financial institutions are under increasing scrutiny concerning their involvement in a number of sectors, from governments, regulators, NGOs, the public and the media. Failure to give careful consideration to environmental impacts from projects financed, invested in or insured can result in negative publicity for both the respective company and the financial institution.

There are many other factors which influence an investor's decision to finance a mining project which include an analysis of the current state of the industry (supply, demand and price factors), the profile of the company (cost profile, operating efficiency, technology, labor factors, access to raw materials, reserve replacement strategy, contingency and emergency planning, safety and environmental record, management) and the state where the project will be located (political risk). All these aspects are important as mining projects can experience various difficulties throughout its development cycle.

4.4 Land Acquisition & Compensation to the Affected Communities

As per the National Planning Commission estimates, about 50 million people have been displaced since 1950 on account of various development projects, of which more than 40% are tribal. Such displacement leads to problems of unemployment, loss of access to traditional sources of livelihood and debt bondage etc. This has led to growing conflicts between the local communities, especially tribals, and the companies that push for development projects in tribal areas and the government machinery. Though land acquisition has been the main reason for this conflict, there are various other reasons such as inadequate rehabilitation and resettlement measures, and a perceived state protection of the interests of the companies and industries.

Generally when agricultural land is acquired, compensation for the land is paid to those who can prove their rights/claims over the land. However in case of forest land only compensation for green loss through afforestation and a premium for diversion of forest land under the net present value (NPV) are paid to the Government by the project developers. No compensation is provided to those who are dependent on the forest for their livelihood.

Globally land acquisition process follows a negotiation-based approach, where the profiting party and the affected party negotiate on the quantum of compensation to be provided. The compensation could be in the form of substituting for lost land, providing sources of employment and monetary offerings. A negotiation-based approach is ideal and justifiable only if it is advantageous to the local community and a productive outcome cannot be obtained through alternative courses of action such as litigation and political action.

Following is an attempt to discuss the various models of providing monetary benefits to the affected community. It may be achieved by structuring financial payments to Indigenous groups taking into account the mode and quantum of payments.

Selection of a particular compensation model will depend on a range of factors including the priorities and objectives of the local community and mining company, the nature of the project, the stage at which the agreement is concluded, profitability of the project and the nature of commodity involved. Functional outcomes can only arise with both the parties involved being fully aware of the advantages and limitations of a particular model. Conflicts arising between the parties should be duly addressed by the Government and ensure agreement terms are abided upon

Table 2: Financial Models for Compensating Affected Communities

Compensation Models	Mining Company	Local Community
1. Single Upfront Payment	<ul style="list-style-type: none"> ■ Single payment made at the start of the project ■ Greater certainty on amount to be paid Increases the capital requirement for the project at the beginning 	<ul style="list-style-type: none"> ■ Greater certainty on receivables ■ No need for administrative setup for ensuring future payments May be a trade-off since not linked to profitability of mine and recourse
2. Fixed Annual Payments	<ul style="list-style-type: none"> ■ Payments are made on an annual basis at an agreed amount for a specific year 	<ul style="list-style-type: none"> ■ Receive annual payments at a agreed amount, which could be identical or fixed for some years

Compensation Models	Mining Company	Local Community
	<ul style="list-style-type: none"> Beneficial than single payment as the costs are spread over the life of the project Detrimental in case there is a sudden fall in output or commodity prices 	<ul style="list-style-type: none"> Predictable payment every year until the mining project is decommissioned No impact of change in output, operating costs and commodity prices Will receive payments during the project development periods <p>If unit royalties are not linked to Consumer Price Index, over time the value of unit royalties may come down as most mining project run for decades</p>
3. Royalties Based on Value of Mineral Output	<ul style="list-style-type: none"> Payments made depending on a pre-decided percentage of the value of mineral output Royalty rate decided based on the financial projections of the project Detrimental when the value of mineral resource remains same and the operating costs increase 	<ul style="list-style-type: none"> Receive royalties depending on a fixed percentage of the value of minerals extracted Beneficial when the output & commodity prices increase, likewise detrimental when output/prices decrease Possibility of revision of royalty rates when the output/prices drastically decreases over a period Will not receive any payments during the project development period
4. Profit Based Royalties	<ul style="list-style-type: none"> Payments depend on “pre-tax” or “post-tax” profits Beneficial over other models since the payments decrease with decreasing profits 	<ul style="list-style-type: none"> Royalties depend on the amount of profits made by the mining project Benefit from rising output and commodity prices, and cost efficient operations May be detrimental when output or prices decrease, higher operating costs & rising interest rates Will not receive any payments during the project development
5. Equity Participation or Shareholding	<ul style="list-style-type: none"> Equity in the project company is given free of charge or on a concessional basis Equity provision removes possibility of guaranteed payments Ensures greater support from the community as they own a share of the project Conflict of interest arises since the local community is both affected and profited by the project, leading to higher costs & delays 	<ul style="list-style-type: none"> Local community receives a share in the project holding company Greater say on the activities of the project Receives a share of dividends paid by the company Capital gains when the equity is divested <p>High Risk approach since there will no guarantee on consistent dividends and increase in share price</p>

4.5 Long-Term Sustainability of Projects

Mining projects across the world have already led to varied degrees of environmental resource degradation and social impacts including displacement of local communities. In particular the Indian mining sector is plagued by several environmental and health/safety related issues, and has attracted severe criticism for its practices.

Ministry of Mines has introduced India-specific Sustainable Development Framework (SDF) principles to address the issues leading to environmental and social problems. The framework revolves around the following eight principles:

1. **Incorporation of Environmental & Social Sensitivities for Leasing Decision** - This principle integrates sustainable development concepts at the earliest phase of the mining life cycle. Areas with mineral resources are to be categorized based on an environmental and social analysis taking a risk based approach. This will ensure the investors have due knowledge on risk profile of the areas, higher costs and uncertainties of receiving approvals etc before the bidding process. It will allow the Government to balance environmental and social interests with that of mining priorities by devising additional obligations in concession lease agreement.
2. **Strategic Assessment in Key Mining Regions** - Majority of the mining activities are in based in clusters. By developing a Regional Mineral Development Plan at regular intervals, the regional and cumulative impact of the mining activities can be monitored. Thus the creation of an institutional structure to own and implement such plans in key mining regions and taking critical decisions on mining, new leases, allocation of resources, and even possible moratorium on mining shall ensure more sustainable planning and development of the regions.
3. **Managing Impacts at the Mine Level** - An assessment of the key environmental, social, health and safety issues and further developing a management framework at the mine level lead to continual improvement of standards. Disclosure of environmental and social parameters to external stakeholders at every stage of the project life cycle will ensure the improvements or degradation is monitored.
4. **Addressing Land, Resettlement and Other Social Impacts** - There has to be a comprehensive assessment of the social impacts and human displacements at household, community and mining region level caused by mining projects. The principle seeks a management commitment to address those impacts through mitigation measures.
5. **Community Engagement, Benefit Sharing & Contribution to Socio-economic Development** - This principle encourages regular engagement with the local community and the sharing of project benefits with the affective communities. The profit sharing principal has already been provisioned in the MMDR Act. The end motive is to mitigate the impact on local communities and, improve livelihoods and living conditions in the neighborhood areas/communities.
6. **Mine Closure & Post-Closure** - Mining companies must prepare, manage and progressively work on a process for eventual mine closure. This process should cover all relevant aspects and impacts of closure in an integrated and multi-disciplinary way. An auditable document should be created to fully scope the estimated costs of closure, and adequately provision to cover national, regional and local legal and regulatory requirements for closure, including the costs of servicing all commitment made to the stakeholders post-closure.
7. **Ethical Functioning & Responsible Business Practices** - This principle promotes the need for ethical business practices and a strong sense of corporate responsibility among mining companies.
8. **Assurance & Reporting** - This principle encourages mining sector stakeholders to assess their performance against the SDF and demonstrate continual improvement over the life of the project.

SDF principles provide guidance to the mining companies on improving performance with respect to environmental and social responsibilities. More and more companies are already adopting practices and technologies which are healthy for the environment and ensure safety norms. The future course for the mining companies should take in account,

- Resource conservation and management by scientific and rational utilization, minimal waste in extraction, finding substitutes of the minerals widely used at present, proper & judicious recycling of used metals and scraps and discovery of new deposits
- Adoption of environment friendly technologies
- Efficient use of energy
- Afforestation and preservation of biological diversity

5. CII-YES BANK 10 Point Road Map

CII-YES BANK 10 point road map to encourage investment in and development of the mining sector across the country is as follows:

i. Progress Policy Framework:

It is desired by the Industry that the policies for mining will enable:

- Maximum area permissible for prospecting license and mining lease to be increased,
- Provision for seamless transition to be added,
- Provision for transfer of concessions on premium basis to be added,
- Provision for enforcing the timelines in grant of concessions.

It is also suggested to set up a National Mineral Royalty Commission, consisting of all the related stakeholders, to continuously review the rates of royalty, dead rent, cess, and percentage of profit sharing. There should be a 'use or lose' component in the mining policy for leases awarded for metal ores, in order to prevent hoarding and ensure best competitive use. The guiding principle behind the mining policy should be the express intent of improving investor sentiment as well as prioritizing sustainable development.

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ii. Fiscal Incentives:

Appropriate fiscal concessions may encourage investment flows into the Indian mineral sector. In India, under the New Exploration Licensing Policy, the oil sector gets 100% deduction on depreciation cost of exploration equipment within the first year and 50% on certain capital machinery during the production stage. The oil sector can also claim 20% of their profit as expenses for bettering the environment (called as site restoration fund). Such measures may also be extended to other minerals to encourage investment.

Improving the quality of infrastructure would also help attract investment from the private sector as well as foreign investment.

iii. Single Window Approach:

The existing procedures for obtaining reconnaissance permit through prospective license to mining lease are time-consuming and cumbersome. There is need for simplification of processes and reduction in number of approvals at the State level for Mining Leases. There is need to streamline and expedite environmental approvals and clearances as well. A Single Window approach for approval can be framed in order to reduce procedural complexities, time-delays and encourage investment in the mining sector.

IV. Stimulating Investments

The Indian mining industry with substantial coal, iron ore, limestone, and other mineral reserves would need extensive scaling up to support the country's Infrastructure targets. Extension of certain investor-friendly steps would certainly make these projects more bankable and in turn help the industry raise financing. Extending the infrastructure status to the mining sector is one such step. Projects in mining, especially Greenfield, require long term financing leading to ALM pressure on banking balance sheets. Formulation of a take-out financing scheme on the lines of the IIFCL scheme addressing such challenges would be another such step. Lastly, streamlining offshore lending mechanisms would help the domestic banking sector provide financing to Indian developers for both, domestic and international mining projects.

There is a crucial need to develop infrastructural facilities like roads, railways, ports, water and power in mineral bearing areas to ensure continuous supply of minerals.

V. Technology Upgradation:

Adequately trained manpower at all levels is necessary for the development of miners and mineral-based industries. India offers a huge pool of human resources with expertise in geology and mining. However, majority of the personnel available in India are required to get requisite exposure on international practices. There is a need for continuous upgradation of technological skills. The existing manpower development programme should also be suitably reoriented with the objective of meeting the

requirements of both employees as well as the industry. Currently the Mining Industry directly employs approximately 0.9 million people and the growth in production over the next decade will lead to a substantial increase in the direct and indirect employment.

VI. Infrastructure Development:

The infrastructure requirement for the Indian mining industry is not met fully due to insufficient capital funds for investments. In addition, to orienting the policies to attract investments for creation of mining infrastructure, the Government may have to encourage formation of joint ventures and alliances for shared infrastructure such as dedicated rail lines and power transmission networks. Further, an appropriate institutional framework is also required for planning and promotion of mining related infrastructure. Government could look at exploring PPP (Public Private Partnership) options towards developing the infrastructure.

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VII. Strengthening Human Resources:

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VIII. Increasing Competitiveness:

The Indian mineral sector needs to improve the productivity in order to compete effectively in international markets, in terms of quality and productivity. Competitiveness could be enhanced through efficiency in operations and prudent cost-cutting measures, through technology infusion.

IX. Environment Friendly Approach:

Extraction and development of minerals are closely interlinked with other natural resources like land, water, air and forest. It is necessary to take a comprehensive view to facilitate the choice or order of land-use keeping in view the needs of development as well as needs of protecting the forests, environment and ecology. Both aspects have to be properly coordinated to facilitate and ensure a sustainable development of mineral resources in harmony with the environment.

X. Social Considerations:

Role of gram Sabhas and Panchayats in the grant process and approval of mining plan and mine closure plan need to be redressed. Due attention must be given to the rehabilitation of the project affected people to avoid further delay of commencement of mining operations and also involve them to become part of the process. Here is where the importance of social equity as a possible model also emerges.

During the land procurement processes along with other factors, the cultural circumstances and also the living standards of the local population should be taken into consideration for any due compensation. Some other aspects that also could be looked for compensating the local communities include preferential procurement policies towards local suppliers / distributors, preferential employment opportunities, skill development and community development programmes. Such steps will act as confidence building measures and will be conducive for the overall project.



Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the growth of industry in India, partnering industry and government alike through advisory and consultative processes.

CII is a non-government, not-for-profit, industry led and industry managed organisation, playing a proactive role in India's development process. Founded over 116 years ago, it is India's premier business association, with a direct membership of over 8100 organisations from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 90,000 companies from around 400 national and regional sectoral associations.

CII catalyses change by working closely with government on policy issues, enhancing efficiency, competitiveness and expanding business opportunities for industry through a range of specialised services and global linkages. It also provides a platform for sectoral consensus building and networking. Major emphasis is laid on projecting a positive image of business, assisting industry to identify and execute corporate citizenship programmes. Partnerships with over 120 NGOs across the country carry forward our initiatives in integrated and inclusive development, which include health, education, livelihood, diversity management, skill development and water, to name a few.

CII has taken up the agenda of "Business for Livelihood" for the year 2011-12. This converges the fundamental themes of spreading growth to disadvantaged sections of society, building skills for meeting emerging economic compulsions, and fostering a climate of good governance. In line with this, CII is placing increased focus on Affirmative Action, Skills Development and Governance during the year.

With 64 offices and 7 Centres of Excellence in India, and 7 overseas offices in Australia, China, France, Singapore, South Africa, UK, and USA, as well as institutional partnerships with 223 counterpart organisations in 90 countries, CII serves as a reference point for Indian industry and the international business community.



YES BANK is a state-of-the-art high quality, customer centric, service driven, private Indian Bank catering to the "Future Businesses of India", and is an outcome of the professional & entrepreneurial commitment of its Founder, Managing Director & CEO, Rana Kapoor. As the Professionals' Bank of India, YES BANK has exemplified 'creating and sharing value' for all its stakeholders, and has created a differentiated Banking Paradigm. Since inception, YES BANK has tried to play a catalytic role in bridging the infrastructure and knowledge gap in various Sunrise sectors of the economy.

In a short span of 6 years, YES BANK has fructified into a "Full Service Commercial Bank" that has steadily built its business lines across the country, and is well equipped to offer a range of products and services to corporate and retail customers. YES BANK offers a full-range of client-focused corporate banking services, including working capital finance, specialized corporate finance, trade and transactional services, treasury risk management services, investment banking solutions and liquidity management solutions among others to a highly focused client base. The Bank also has a widespread branch network of 255 branches, with over 250 ATMs and 2 National Operating Centres in Mumbai and Gurgaon.

Confederation of Indian Industry

H.No. 1-11-252/9, Plot no. 7, Regal House,
Motilal Nehru Nagar, Begumpet, Hyderabad - 500 016
Tel: +9140 27765964/66/67 Fax: +9140 27766116
E-Mail: cii.hyderabad@cii.in Website: www.cii.in