Indian Minerals Yearbook 2012

(Part- I : General Reviews)

51st Edition

INDIAN MINERAL INDUSTRY & NATIOINAL ECONOMY

(FINAL RELEASE)

GOVERNMENT OF INDIA
MINISTRY OF MINES
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NATIONAL ECONOMY

The Indian economy achieved a growth rate of 8.6% and 9.3% respectively in 2009-10 and 2010-11 despite the slowdown induced by the global financial crisis in 2008-09. However, with the economy exhibiting inflationary tendencies, the Reserve Bank of India (RBI) started raising policy rates in March 2010. High rates as well as policy constraints adversely impacted corporate and infrastucture investment, and in the subsequent two years viz, 2011-12 and 2012-13, the growth rate slowed down to 6.2% and 5.0%, respectively. The slowdown, especially in 2012-13, has been across the board, with no sector of economy unaffected.

Gross Domestic Product (GDP) is a key indicator by which a nation's economic performance is gauged. Economic policies bring about pronounced changes in the industrial climate, foreign trade, domestic and international taxation policies, monetary exchange rates, etc., that have over reaching effects on the overall growth of an economy. As per advance estimates in India's Economic Survey 2012-13, GDP growth rate at factor cost (at constant 2004-05 prices) touched 5.0% in 2012-13 as against 8.6% in 2009-10, 9.3% in 2010-11 and 6.2% in 2011-12.

Economic parameters as per advance estimates published in Economic Survey 2012-13 reveal that the GDP in 2012-13 at current market prices and at factor cost at constant 2004-05 prices was ₹100,28,118 crore and ₹5,03,476 crore, respectively.As per the Advance Estimates released by the Central Statistics Office (CSO), the rate of growth in terms of GDP at market prices (at 2004-05 prices) is expected to be 3.3% for 2012-13 as against 6.3% in 2011-12. The growth rate declined significantly on account of the reduction in investment rate and lower growth of exports vis-a-vis that of imports.

After recovering to a growth of 9.3% in 2010-11, growth of value added in industrial sector, comprising manufacturing, mining, electricity and construction sectors slowed to 3.5% in 2012-13. The manufacturing sector, the most dominant sector within industry also witnessed a decline in growth to 2.7% in 2011-12 and 1.9% in 2012-13 compared to 11.3% and 9.7% in 2009-10 and 2010-11, respectively. The growth in electricity sector in 2012-13 has also moderated. The growth of the mining sector in 2012-13 is estimated at 0.4%, showing an improvement from a negative growth of 0.63% recorded in 2011-12. The moderation in industrial growth, particularly in the manufacturing sector, is largely attributed to sluggish growth of investment, squeezed margins of the corporate sector, deceleration in the growth rate of credit flows and the fragile global economic recovery.

After achieving double-digit growth continuously for five years and narrowly missing double digits in the sixth year (between 2005-06 and 2010-11), the gowth rate of the services sector declined to 8.2% in 2011-12 and 6.6% in 2012-13. The slowdown in the growth rate of services contributed significantly to slowdown in the overal growth of the economy. While some slowdown could be attributed to the lower growth in agriculture and industrial activities, given the backward and forward linkages with services, lower demand from the rest of the world could also have played a part.

The eight core infrastructure industries registered a growth of 3.3% during April-December 2012 as compared to 4.8% during the same period of the previous year. The decline in growth in the current year so far is mainly on account of negative growth witnessed in the production of coal, natural gas and fertilizers.

During the Twelfth Five Year Plan, the total investment in the infrastructure sector estimated at ₹56.3 lakh crore will be nearly double that made during the Eleventh Five Year Plan. This increase in investment will be feasible primarily because of enlarged private sector

participation that is envisaged. Their share in infrastructure investment increased from 22% in the Tenth Five Year Plan to 38% in the Eleventh Plan and is expected to be about 48% during the Twelfth Five Year Plan. The status report of major central-sector infrastructure projects costing ₹'150 crore and above for the month of September 2012 shows that out of the 566 projects, five were ahead of schedule, 226 on schedule and 258 had been delayed with respect to their latest scheduled date of completion. Among the infrastructure services, growth in freight traffic by railways has been comparatively higher so far, while the civil aviation sector and cargo handled at major ports have witnessed negative growth. In the road sector, the National Highways Authority of India (NHAI) achieved 17.3% growth during the current financial year upto November 2012. Electricity generation by power utilities during 2012-13 was targeted to go up by 6.05% to 930 billion units. The growth in power generation during April to December, 2012 was 4.55% as compared to about 9.33% during April to December, 2011.

India's merchandise trade increased exponentially in the last decade from US$ 95.1 billion in 2000-01 to US$ 620.9 billion in 2010-11 and further to US$ 793.8 billion in 2011-12. India's share in global exports and imports also increased from 0.7% and 0.8% respectively in 2000 to 1.7% and 2.5% in 2011 as per the WTO report. Its ranking in the leading exporters and importers improved from 31 and 26 in 2000 to 19 and 12 respectively in 2011. While India's total merchandise trade as a percentage of the gross domestic product (GDP) increased from 28.2% in 2004-05 to 43.2% in 2011-12 as per provisional estimates. India's merchandise exports as a percentage of GDP increased from 11.8% to 16.5% during the same period.

India's exports, which had surpassed pre-crisis levels within a year in 2010-11 with a record 40.5% growth, continued growing even in 2011-12, but were finally affected by the global slowdown in 2012-13 with exports declining even more at (-) 4.9% in the first ten months from the (-) 3.5% recorded during the crisis-ridden year of 2009-10. After recovering in 2010-11 from the previous year's fall India's merchandise imports increased further to US$ 489.2 billion with a growth of 32.3% in 2011-12. This was due to the increase in growth of petroleum, oil, and lubricant (POL) imports by 46.2% and non-POL imports by 26.7%. POL imports registered a high growth mainly due to increase in import price of the Indian crude oil import basket by 31.5% in 2011-12 as against 22% in 2010-11.

Trade deficit (on customs basis) reached a peak of US$ 184.6 billion in 2011-12 from US$ 118.6 billion in 2010-11 with the highest growth of 55.6% since 1950-51. Moderate export growth and high import growth, particularly in POL imports due to high prices and high gold and silver imports, led to the highest-ever trade deficit in India since 1950-51, contributing to a high current account deficit (CAD) of 4.2% of GDP.

The trade deficit of US $ 167.2 billion for 2012-13 (April-January) was 7.9% higher than the US $ 154.9 billion in 2011-12 (April-January). While POL imports grew by 46.2% in 2011-12, POL export growth was relatively lower at 34% due to lower growth in the quantum of POL exports by 3.8% resulting in net POL imports increasing to US $ 99.3 billion in 2011-12. In 2012-13 (April-November), though POL import growth moderated to 11.7%, POL export growth was negative at (-) 7.3% which was also due to the decline in the volume of POL exports by (-) 0.9%. As a result, the share of net POL imports in total imports increased to 23.5% in 2012-13 (April-November) as compared to 20.3% in 2011-12 (whole year).

Foreign Direct Investment (FDI), being a non-debt capital flow, is a leading source of external financing, especially for the developing economies. It is expected to bring not only capital and technical know-how but also increase the competitiveness of the economy. Overall, it supplements domestic investment, much required for sustaining the high growth rate. Since 2000, significant changes have been made in the FDI policy regime by the government to ensure that India becomes an increasingly attractive and investor-friendly destination. During April-November 2012-13, FDI inflow was US$ 24.65 billion. FDI equity inflows were US$ 15.85 billion showing a decline of 43% as compared to the corresponding period of the previous year. Cumulative FDI inflow from April 2000 to November 2012 stood at US$ 277.86 billion.

MINING INDUSTRY

Mineral production in the country has slightly decreased. The index of mineral production (base 2004-05=100) for all minerals (excluding atomic minerals) with revised base year stood at 128.45 points in 2011-12 as against 131.06 points in 2010-11 registering a decrease of 2%.

Index for metallic minerals and crude petroleum & natural gas declined by 15.4% and 2.3% respectively over 2010-11, whereas index for coal & lignite and non-metallic minerals was increased by 1.7% and 5.4%, respectively.

The total value of mineral production (including minor minerals but excluding atomic minerals) showed an increase of about 2.5% in 2011-12 at ₹ 25,5677crore as against ₹249,405 crore in 2010-11. This was due to overall rise in the production of coal, lignite, petroleum (crude), bauxite, lead concentrate, ball clay, felspar, diamond, graphite, limestone, phosphorite, silica sand, wollastonite, etc. as also due to higher average value recorded by chromite, copper concentrate, gold and bauxite (Table-1).

In metallic ore, production increased in respect of lead concentrate (9%) and bauxite (1%). However, drop in production was observed in case of manganese ore (23%), iron ore (19%), chromite (13%), gold (9%) and copper concentrate (5%).

Among the important non-metallic minerals, rise in production in 2011-12 was observed in gypsum (35%), phosphorite/rock phosphate (11%), talc/soapstone/steatite (6%) and limestone (4%), while substantial fall in production was noticed in the case of magnesite (8%), dolomite (7%). The production of kaolin remained almost same in 2011-12 as in the previous year.

Table – 1 : Indian Mineral Industry : Value of Production*
2009-10 to 2011-12

(In ₹ million)

Sector	2009-10 (R)	2010-11 (R)	2011-12 (P)	% change between		Sectoral contribution to the total value in %	
				2009-10 and 2010-11	2010-11 and 2011-12	2010-11	2011-12
Total : All Sectors	**1921084**	**2494055**	**2556772**	**+29.82**	**+2.52**	**100.0**	**100.0**
Fuels	1336584	1685813	1754975	+26.13	+4.10	67.59	68.64
(a) Solid fuel	550938	663518	755096	+20.43	+13.80	26.60	29.53
(b) Liquid & gaseous fuels	785646	1022295	999879	+30.12	-2.30	40.99	39.10
Metallic minerals	317338	476388	469016	+50.12	-1.54	19.10	18.34
Non-metallic minerals	46661	53983	54910	+15.69	+1.72	2.16	2.15
Minor minerals**	220501	277871	277871	+26.02	–	11.14	10.87

Figures rounded off individually.
** Excluding the minerals declared as prescribed substances under Atomic Energy Act, 1962.*
*** Earlier year's figure has been taken as estimate for 2011-12 because of non-receipt of data.*

The value distribution of mineral production in 2011-12 showed that fuels acounted for about 69%, metallic minerals about 18%, non-metallic minerals about 2% and minor minerals about 11%. In the production value of metallic minerals, iron ore accounted for about 81%, chromite 6%, lead (conc.) and zinc (conc.) together 5%, manganese ore & silver 3% each, coper(conc.) primary gold and bauxite 1% each. Value of tin concentrates production was nominal.

Amongst the non-metallic minerals, about 97% value was shared by 13 minerals namely, limestone (67%), phosphorite/rock phosphate (12%), barytes, dolomite & garnet (3% each), gypsum (2%) and kaolin, talc/ soapstone/steatite, magnesite, marl, ball clay, sillimanite & silica sand (about 1% each). The remaining 3% value was contributed by other non-metallic minerals. The production in respect of emerald, corundum (ruby and sapphire), garnet (gem) and pyrites was not reported.

India produced as many as 89 minerals which included 4 fuel minerals, 11 metallic minerals, 52 non-metallic (industrial minerals) including ilmenite, rutile and zircon which were atomic minerals earlier and 22 minor minerals (building and other materials) in 2011-12.

Indian Mining Industry is characterised by a large number of small operational mines. The total number of working mines, (excluding atomic minerals, minor minerals, crude petroleum and natural gas) in the country was 3236 in 2011-12 as against 3119 in 2010-11. Among them, 573 mines belonged to coal and lignite, 633 mines to metallic minerals and 2,030 mines to non-metallic minerals (Table-2). There were 769 mines in public sector and the remaining 2467 mines in private sector.

The public sector continued to play a dominant role in mineral production in 2011-12 accounting for 59% or ₹ 1,50,199 crore in the total value. Small mines, which were mostly in the private sector, continued to be operated manually either as proprietary or partnership ventures. The minerals which were wholly mined/ recovered by the public/joint sector during 2011-12 were copper ore, diamond, fluorite (conc. and graded), phosphorite/rock phosphate, rock salt, selenite and sulphur. By and large, almost the entire production of lignite, gold (primary), barytes, gypsum and sand (others) was from public sector. In 2011-12, the public sector accounted for sizeable 91% production of coal, 82% of tin (conc.), 74% of petroleum (crude), 69% of kyanite and 65% of magnesite.

In 2011-12, the mining and quarrying sector accounted for about 2.4% of the total GDP. The contribution of Mining and Quarrying sector in the total GDP in 2011-12 was ₹ 2,01,076 crore indicating an increase of 15% over that in the preceding year. This was mainly due to rise in the value of coal, lignite, petroleum (crude), chromite, bauxite, lead conc., ball clay, diamond, felspar, graphite, limestone, silica sand, wollastonite, phosphorite/rock phosphate in 2011-12.

Table – 2 : Number of Operating Mines 2010-11 and 2011-12

Sector	2010-11 (R)	2011-12 (P)
All Minerals*	**3119**	**3236**
Public sector	776	769
Private sector	2343	2467
Coal (including lignite)	573	573
Metallic minerals	719	633
Non-metallic minerals	1827	2030

** Excluding atomic minerals, petroleum (crude), natural gas (utilised) and minor minerals.*

The contribution of minerals covered under MCDR, 1988 (which include metallic and non-metallic minerals but exclude petroleum, natural gas, coal lignite, sand for stowing, atomic minerals and minor minerals) in GDP of mining and quarrying sector, during 2011-12 was 22% of which metallic minerals contributes 20% and non-metallic minerals 2%. Among metallic minerals, iron ore accounted for 17% while chromite, lead & zinc concentrates combined accounted for about 1% each in 2011-12. Among the non-metallic minerals, the share of limestone was about 1% while the remaining 1% was jointly contributed by the remaning non-metallic minerals.

In 2011-12, production of minerals covered under MCDR, 1988 was reported from 20 States. Accrual to GDP from Mining & Quarrying sector by minerals covered under MCDR, 1988 was accounted for mainly by Odisha (38%), Chhattisgarh (21%), Goa (14%), Rajasthan (9%), Karnataka (7%), Jharkhand (3%), Andhra Pradesh & Madhya Pradesh (2% each) and Maharashtra, Tamil Nadu & Gujarat (1% each).

The average daily employment in mining sector in 2011-12 was estimated at 5,33,243 persons. The public sector accounted for 4,18,525 persons (78%) and the private sector the remaining 1,14,718 persons (22%) .

India's ranking in 2011 in world production was 2nd in barytes and talc/steatite/ pyrophyllite; 3rd in chromite, coal & lignite and zinc; 4th in iron ore, kyanite/sillimanite and steel (crude); 6th in manganese ore & bauxite ; 8th in aluminium; 10th in refined copper; and 11th in magnesite. The statistics on indigenous and world production of principal minerals and metals are given in Table-3.

Table – 3 : Contribution and Rank of India in World Production of Principal Minerals & Metals, 2011

Commodity	Unit of quantity	Production		Contribution (Percentage)	India's rank in order of quantum of production
		World	India*		
Mineral Fuels					
Coal & lignite	Million tonnes	7739	582	7.5	3rd
Petroleum (crude)	Million tonnes	3980	38	1.0	24th
Metallic Minerals					
Bauxite	'000 tonnes	248000	12877	5.2	6th
Chromite	'000 tonnes	26300	3764	14.3	3rd
Iron ore	Million tonnes	3012	167	5.5	4th
Manganese ore	'000 tonnes	47300	2349	5.0	6th

(Contd.)

Table – 3 : (Concld.)

Commodity	Unit of quantity	Production		Contribution (Percentage)	India's rank in order of quantum of production
		World	India*		
Industrial Minerals					
Barytes	'000 tonnes	9000	1723	19.1	2nd
Kyanite, andalusite & sillimanite	'000 tonnes	460(e)**	62	13.5	4th
Magnesite	'000 tonnes	23100	217	1.0	11th
Apatite & rock phosphate	'000 tonnes	203000	2330	1.1	14th
Talc/steatite/ pyrophyllite	'000 tonnes	7800	1198	15.4	2nd
Mica (crude)	tonne	307000	1807	0.6	15th
Metals					
Aluminium	'000 tonnes	45200	1654	3.7	8th
Copper (refined)	'000 tonnes	19500	504	2.6	10th
Steel (crude/liquid)	Million tonnes	1516	73.8@	4.8	4th
Lead (refined)	'000 tonnes	10400	92	0.9	18th
Zinc (slab)	'000 tonnes	13000	783	6.0	3rd

Source: *World mineral production data compiled from World Mineral Production, 2007-2011; British Geological Survey.*

* *Figures relate to 2011-12*

** *Mineral Commodity Summary, 2012, USGS.*

@ *Ministry of Steel, Annual Report, 2011-12.*

MINERAL-RELATED POLICIES

The significant developments relating to National Mineral Policy and other mineral-related policies that took place in 2011-12 are given below:

The Mines and Minerals (Development and Regulation) Bill, 2011

To reflect the objectives and reasons emanating from the new National Mineral Policy (NMP), 2008, the Mines and Minerals (Development & Regulation) Bill, 2011 was prepared by Ministry of Mines after several rounds of consultation and workshops with all stakeholders to replace the existing Mines & Minerals (Development & Regulation) Act, 1957. The Bill has been introduced in Lok Sabha on12th December, 2011 after approval of the Cabinet and referred to the Parliamentary Standing Committee on Coal & Steel on 5th January, 2012. After recommendations of the Standing Committee in the form of 36th report of Lok Sabha Secretariat, it has been presented in Lok Sabha and Rajya Sabha on 7.5.2013.

The Bill seeks a complete and holistic reform in the mining sector, with provisions to address issues relating to sustainable mining and local area development, especially those of the habitat population impacted by mining operations. The Bill also aims to ensure transparency, equity, elimination of discretions, effective redressal and regulatory mechanisms along with incentives encouraging good mining practices, which will also lead to technology absorption and exploitation of deep-seated minerals.

The Bill also provides for establishment of a National Mining Regulatory Authority, State Mining Regulatory Authority, National Mining Tribunal and State Mining Tribunals to exercise jurisdiction, powers and authority conferred on them under the proposed legislation.

The notable feature of the Bill is to empower the Central Government to institutionalise a statutory mechanism for ensuring sustainable mining with adequate concerns for environment and socio-economic issues in the mining areas, through a National Sustainable Development Framework.

Mining Tenement System

The MTS has been envisaged by the Ministry to automate the various processes associated with the mineral concession regime. This would not only give an impetus to the decision-making process but is also expected to bring transparency and efficiency. The MTS will not only enable online filing of applications but it will also help identify online, the areas for various types of mineral concessions. This would involve integration of web-based technology services with Geographical Information System (GIS), so that information could be delivered spatially in the form of maps. IBM has been nominated by the Ministry as the Nodal Implementing Agency for the project.

The project for preparation of DPR has been formulated and the consultant for DPR preparation was appointed in May, 2011. The inception report covering As-is-study of the Ministry of Mines and IBM has been completed and approved by the Ministry of Mines.The Detailed Project Report (DPR) of MTS had been approved by the Core Committee in its meeting held on 31.10.2012. M/s Ernst & Young Pvt. Ltd had been requested to prepare Expression of Interest (EOI) and Request for Proposal (RFP) as per approved DPR. SFC notes on the subject has been approved; RFP document is finalised. Online Bids are invited from eligible bidders for selection of an implementation agency for design, development, maintenance and operation of MTS for IBM.

Sustainable Development Framework for Mining Sector (SDF)

As per the recommendations of a High Level Committee headed by Shri Anwarul Hoda, a Sustainable Development Framework specially tailored to the Indian context was developed taking into consideration the work being done in International Council of Mining and Metals (ICMM) and International Union for the Conservation of Nature and Natural Resources (IUCN). The SDF was based on the following eight principles.

- Incorporating Environment and Social sensitivities in decision on leases.
- Strategic assessment in Key Mining regions.
- Managing Impacts at the Mine Level through sound management systems.
- Addressing land, resettlement and other social impacts.
- Community Engagement and other Social impacts.
- Community Engagement, Benefit sharing and contribution to socio-economic development.
- Mines Closure and Post Closure.
- Assurance and Reporting.

Final Sustainable Development Framework for mining sector for the Ministry has been prepared by ERM India Private Limited for all concerned stake holders in mining sector (non coal, non fuel, non atomic minerals, not covering off shore mining).

Allocation of coal block

The Ministry of Coal has initiated the process of allocation of Coal Blocks under the amended provisions of Section 11A of MMDR Act and Rules framed thereunder. In the first round the Government proposes to allocate coal blocks to the Government Companies/Undertakings(Central and State) for specific end-use (power) and coal mining.

Accordingly, on 1st January, 2013, it has been decided to offer 17 coal blocks with combined geological reserves of 8.5 billion tonnes (14 coal blocks with reserves of 8.2 billion tonnes for end-use i.e. for power and 3 coal blocks for mining) to different Government Companies/Undertaking

(Central and State). Earlier, Ministry of Coal had already placed the pre-determined evaluation criteria for specified end-use and coal mining along with the details to be furnished by the applicant, by the Government Companies/Undertakings on 27th December, 2012. The applications had to be submitted within thirty days (i.e. to be submitted up to 30th January, 2013) in the Ministry of Coal.

Coordination-cum-Empowered Committee

The Ministry of Mines has set up Coordination-cum-Empowered Committee in order to monitor and minimise the delays in grant of various approvals by the Ministries/Departments concerned in the Central Government for grant of mineral concessions. Further, the Ministry has reconstituted the CEC as 'Coordination-cum-Empowered Committee on Mineral Development and Regulation" on 20th December, 2011. The Terms of Reference (TOR) have also been broadened, so as to bring within its ambit other important matters, viz, Sustainable Development Framework, Coordination/review of steps for prevention of illegal mining, issues arising out of the National Mineral Policy and legislation governing mineral development, etc.

Results Framework Document (RFD)

Central Government has adopted a Results Framework System to set goals and quantitatively monitor performances on an outcome basis. During the year 2012-13 the Ministry of Mines achieved a composite score of 56.38% and IBM achieved a composite score of 77.96%.

Justice M.B. Shah Commission of Inquiry for illegal Mining of Iron Ore and Manganese Ore

Central Government has appointed a Commission of Inquiry comprising of Justice M.B. Shah, Retd. Judge of the Supreme Court of India, vide Notification S.O. 2817 dated 22 November, 2010 to inquire into the large-scale illegal mining of iron ore and manganese ore. The first sitting of the Commission was held on the 17th January, 2011 and the Commission has submitted its report on illegal mining on the State of Goa to the Government on 5th March, 2012 and 25th April, 2012.

The Commission is collecting and compiling information on mining from seven important mineral producing States, which is quite voluminous. The States will take more time for supply of such information to the Commission, requiring additional time for completion of its report. Therefore, the Central Government has extended the term of the Justice Shri M.B. Shah Commission of Inquiry for a period of one year beyond the 17th July, 2012 up to the 16th July, 2013 vide notification SO 1738 (E) dated 3rd August, 2012 and subsequently upto 16th Oct, 2013 to finalise its report vide notification SO 2205(E) dated 19th July, 2013.

Landslide studies

As per Ministry of Mines notification no. 11/6/2012-M.I. dated 20th September, 2012, the Geological Survey of India (GSI) has been designated as the Nodel Agency for carrying out landslide studies. The National Disaster Managment Guildelines of National Disaster Managment Authority (NDMA): Under the heading of Management of Landslides and Snow Avalanches, the guidelines recommends that a high level scientific and Technical Advisory Committee be constituted under the chair of Secretary, Ministry of Mines, in consultation with NDMA. The Committee will serve as a think tank to nurse the landslide sector with fresh ideas and stimulus carrying cutting -edge technology.

Study Group on Revision of Rate of Royalty and Dead Rent

In order to review the royalty rates and dead rent, the Ministry of Mines has constituted a Study Group on revision of rates of royalty and dead rent for minerals (other than coal, lignite and sand for stowing) and to make appropriate recommendations to the Government on 13th September 2011. It was reconstituted on 4th February, 2013, with Special Secretary (Mines) as Chairperson. Apart from other terms of reference, the Study Group has also been mandated to recommend revision of rates and in case, if necessary, give an additional conditional recommendation on what should be the royalty rate and the mechanism for computation of royalty rates after taking into account the liabilities on the lease holder as envisaged in the draft MMDR Bill, 2011, in the event the Parliament approves the new draft Bill.

Other terms of reference of the Study Group are: to consider the feasibility of allowing incentivised royalty rates for base metals, noble metals, REE and precious stones to encourage exploration; to suggest incentivised royalty rates on ad valorem basis for beneficiated or concentrated ore; to consider and recommend policies relevant to mineral development and administration of royalty regime; and to suggest appropriate revision in the existing rates of dead rent given in the Third Schedule to the Mines and Minerals (Development and Regulation) Act, 1957.

The Study Group has prepared a draft recommendations which were circulated to the members of Study Group on 16.5.2012 for their comments.

The Ministry of Mines has decided vide its letter No. 3/3/2011-MVI dated 4th Feburary, 2013 to extend the tenure of the Study Group for submission of the report up to 31.3.2013. Subsequently, it has been decided by letter of even no. dated 10th April, 2013 of Ministry of Mines to extend the tenure of the Study Group for submission of the report up to 31.6.2013.The Study Group submitted its report on 28.6.2013 which is under consideration of Government.

International Co-operation

During 2012-13, Ministry of Mines signed Memoranda of Understanding with Province of Canada and Republic of Peru and Quebec to enhance the bilateral co-operation in the field of Geology and Mineral Resources.

New Exploration Licencing Policy (NELP)

The New Exploration Licencing Policy (NELP) provides an international class fiscal and contract framework for exploration and production of hydrocarbons. The government may offer as many as 68 blocks or areas for exploration of oil and gas in the tenth round of NELP for the year 2013-14. Of the blocks being considered for offering in NELP-X, 25 are deep water, 20 shallow water and 23 onland blocks. NELP-X is likely to be held on new terms wherein a bidder shall be asked to quote the amount of oil or gas output it is willing to offer to the government from the first day of production.

The Government has in previous nine rounds awarded 254 blocks for exploration of oil and gas. Of the 34 areas offered in NELP-IX in 2010, bids were received for 33 blocks at the close of bidding on March 28, 2011. The award of exploration blocks under NELP -IX was likely to be finalised.

Foreign Trade Policy

The basic customs duty on coating material for manufacture of electrical steel, ammonium metavanadate (used in manufacture of ferro-vanadium) plant and machinery imported for setting up or substantial expansion of iron ore pellets/beneficiation plants, CVD on steam coal, pre forms of precious and semi-precious stones, stainless steel wire cloth strip wash coat (for use in manufacture of catalytic converters and their parts) was reduced while that on non-alloy steel and flat-rolled products (HR and CR), standard gold bar and platinum bars, non-standard gold, gold ores/concentrates and dore bars for refining were increased. Nickel oxide/hydroxide, nickel ore/ concentrates, natural gas/liquefied natural gas (imported for power generation), etc. have been fully exempted from basic customs duty. Full exemption from export duty is also provided to galvanised steel sheets. Basic customs duty has been imposed on cut and polished coloured gemstones. Customs duty is being levied on export of unprocessed & upgraded illmenite and bauxite (natural calcined and not calcined).

Royalty on Coal and Lignite

The Government has constituted a Study Group on 4.2.2010 for revision of royalty rates for coal & lignite. Taking into consideration the submissions made by all stakeholders, the interests of the coal producing States, the consumers and the national economy as a whole, the Study Group recommended switching over to a full-fledged ad valorem regime of royalty for coal and lignite.

Vide Gazette of India Notification G.S.R. 349. (E), dated the 10th May, 2012 by the Ministry of Coal, the royalty rate of Coal including Lignite were revised and applicable for a minimum period

of three years from 10.05.2012. The rate of royalty on coal shall be @ 14% (Fourteen percent) ad valorem on price of coal, as reflected in the invoice, excluding taxes, levies and other charges while that of lignite shall be @ 6% (Six percent) ad-valorem on transfer price of lignite, as ratified by the Central Electricity Regulatory Commission (CERC) and for lignite sold to other consumers, the royalty shall be @ 6% (Six percent) ad valorem on the price of lignite as reflected in the invoice, excluding taxes, levies and other charges. This is applicable in all the States and Union territories, except the State of West Bengal. For the West Bengal, the rate of royalty has been published separately in the said notification.

Other Policies

The Policy for issue of import licences of Rough Marble and Travertine Blocks for the financial year 2012-13 has been notified vide Notification No. 12 (RE-2012)/2009-2014 S.O. 1953(E) dated 22nd August, 2012 by Ministry of Commerce & Industry, Department of Commerce.

As per Gazette of India, Ministry of Commerce & Industry, Department of Commerce Notification No. 20 (RE-2012)/2009-2014, S.O. 2423(E), Dated: 9th October, 2012, the Central Government made amendments in Schedule-I (Imports) to the ITC (HS) Classifications of Export and Import Items of the Foreign Trade Policy, 2009-14 regarding Policy for allocation of quota for import of Rough Marble Blocks for Indian companies investing abroad in marble mining, for the year 2012-13.

Amendments in Handbook of Procedure (HBP) of the Foreign Trade Policy, 2009-14 (including Appendices and ANFs) have been made vide Public Notice No. 18 (RE-2012) / 2009-14, dated 28th September, 2012 by Ministry of Commerce & Industry, Department of Commerce.

LEGISLATION

MMDR Act, 1957

To replace the existing Mines and Minerals (Development and Regulation) Act, 1957, the Mines and Minerals (Development and Regulation) Bill, 2011 has been prepared by the Ministry of Mines .The Cabinet has approved the bill and it has been introduced in Lok Sabha on 12th December, 2011, and the same has been referred to standing Committe on Coal and Steel on 5th January, 2012.The recommendations of the Standing Committee has been presented to Lok Sabha and laid in Rajya Sabha on 7.5.2013.

MCR, 1960

Ministry of Mines vide Notification No. G.S.R. 593 (E), dated 26.7.2012 had made amendment in MCR, 1960 by which definition of "illegal mining" is inserted after rule 2(ii). Similarly, rule 3A and rule 4A is inserted after rule 26 (3)and rule 27(4) respectively, in MCR, 1960.

The Mineral Conservation and Development Rules, 1988 (MCDR)

Rule 45 of MCDR 1988 was amended on 9th February, 2011, to facilitate end-to-end national-scale accounting of all minerals produced in the country from the pit head to its end-use, reducing the scope for illegal mining, royalty evasion, etc. Rule 45 of the MCDR,1988 provides for the mining companies to provide periodic reports on the extraction and disposal of the mined material. The above said amended Rule now makes it mandatory for all miners, traders, stockists, exporters and end-users of minerals to register and report on the production, trade and utilisation of minerals to the State Government(s) and Indian Bureau of Mines.

EXPLORATION & DEVELOPMENT

GSI, AMD, DGMs of various States, public sector companies like NMDC, MECL, MOIL, etc. continued their efforts for surveying, mapping and exploration of new deposits and reassessment of old deposits/mines during 2011-12. In oil sector, ONGC, OIL and a few joint venture and private companies were engaged in exploration of onshore and offshore areas in 2011-12. Exploration conducted by various organisations during 2011-12 is highlighted below:

Geological Survey of India (GSI)

The GSI is vested with the responsibility of maintaining broad-based and uniform national

approach to data generation in respect of mineral resources. With the near exhaustion of resources to the proximity of surface, it has become imperative to have multidisciplinary approach to mineral exploration which comprises large-scale and detailed geological mapping aided by interpretative analysis of aerogeophysical and remotely sensed data, ground geophysical survey, geochemical prospecting and surface and subsurface exploration through pitting, trenching and drilling. During 2011-12, about 1880 sq km large-scale mapping, 45.10 sq km detailed mapping and 63097 m drilling were carried out in comparison to 2,425 sq km large-scale mapping, 32.21 sq km detailed mapping and 57,961 m drilling carried out in the previous year. Out of the total mappable areas of 3.146 million sq km of the country, 3.094 million sq km has been covered so far by systematic mapping bringing the total coverage to 98.34%. Additional resources were estimated for coal, gold, base metal, iron ore and manganese ore. The highlights of the resources assessed are given below in brief :

During 2011-12, GSI estimated about 5,611 million tonnes of coal resources in various coalfields of Andhra Pradesh, Chhattisgarh, Madhya Pradesh, Odisha and West Bengal; about 1.15 million tonnes (at 20% Mn cut off) and 0.608 million tonnes (at 10-20% Mn) of inferred manganese ore resources (333) in Damurda (South) block, Keonjhar district, Odisha; about 13.67 million tonnes lignite in Rajasthan; about 1.69 million tonnes (wt av. grade of HM is 3.68%) of heavy mineral resources and 279.625 tonnes of tentative resources of phosphorite (av. grade 16.44% P_2O_5 with 5% P_2O_5 cut off) in Jhabua district, MP have been estimated.

GSI continued its offshore geo-scientific studies both in Exclusive Economic Zone (EEZ) and Territorial Waters (TW) along the East and West Coasts of India. During 2011-12, a total of 17 cruises were undertaken using three vessels; six cruises aboard R.S. Samundra Manthan within EEZ, seven cruises aboard R.V. Samundra Kaustubh within the TW off the East Coast and four cruises aboard R.V. Samundra Shaudhikama within the TW off the West Coast. Surveys in the near shore zones were carried out using hired small mechanised boats.

GSI pursued its airborne geophysical surveys for generating database employing magnetic and gamma ray spectrometric techniques.The airborne survey operations over Chandrapur-Brahmapuri area were started in December 2011 and continued till 16.01.2012. Airborne data along a total of 41,391 km out of total assigned target of 17,990 km was acquired only at average height of 150 m.

MECL

During 2011-12, MECL established about 2,296 million tonnes of coal resources; about 1043 million tonnes of lignite resources; about 4.23 million tonnes of iron ore resources and about 1.26 milion tonnes of rock-phosphate resources.

State Directorates of Geology and Mining

DGM, Chhattisgarh, established about 14 million tonnes coal in Raigarh district; 3.25 lakh tonnes of bauxite in Kabirdham district and 4 lakh tonnes bauxite (metal grade) in Surguja district; about 5.109 million tonnes of iron ore reserves (35-45%Fe); about 69 million tonnes of cement-grade and 34.98 million tonnes of cement grade (blendable & beneficiable) limestone resources in Raipur and Bastar districts; about 28 lakh cu m black granite in Bastar and Kanker districts.

DMG, Rajasthan, estimated about 15 million tonnes gypsum resources in Bikaner district; about 0.57 million tonnes lignite in Kenya ki Basti, Bikaner district; about 1.683 million tonnes of limestone, about 76.8 million tonnes geological resources of limestone, about 3.43 million tonnes marginal cement gade of limestone, about 48 million tonnes cement grade and 10 million tonnes chemical grade limestone in Jhalawar, Jodhpur & Pali, Kota and Nagaur districts; about 35,250 tonnes of silica sand and red ochre in Dausa district; about 5.33 million tonnes of sandstone resources in Dhaulpur district; a bout 0.09 million tonnes of colloidal silica sand resources (inferred) in Karauli district.

Oil and Natural Gas Corporation Ltd (ONGC)

ONGC continued its operations for exploration of oil and gas and acquired a total of 13,606 GLK/ LK of 2D and 9,820 sq km of 3D seismic data during 2011-12. A total of 135 exploratory wells with cumulative metreage of 3,76,290 m and 280 development wells with cumulative metreage of 5,58,690 were drilled. ONGC established 24 new hydrocarbon discoveries in 2011-12 in Assam, Assam Arakan basin, Western offshore, Frontier basin, AAFB-Cacher basin, Andaman offshore basin, Mahanadi offshore, Cambay basin, Saurashtra offshore, Kachchh offshore, Mumbai offshore, Krishna-Godavari offshore and Cauvery onland basin. The ultimate reserve accretion of oil & oil equivalent gas (O+OEG) in 2011-12 in domestic assets of ONGC was 84.13 million tonnes. The total ultimate reserve of O+OEG as on 31.3.2011 was 2679.04 million tonnes.

Oil India Ltd (OIL)

OIL continued its operations for exploration of crude oil and natural gas in 2011-12 and acquired a total of about 1440 GLK of 2D and 1838 sq km 3D seismic data. Exploration resulted in significant discoveries of oil/gas within Tipam and Barail Formation, Lakadong & Therria and Langpar Formation, Kopili Formation, Girujan formation.

Indian Bureau of Mines (IBM)

IBM as a facilitator to mineral industry (a) provided technical consultancy services in feasibility study, environmental impact assessment, environmental management plan, etc.; (b) carried out mining research on need-based aspects of mining; (c) conducted mineral beneficiation studies, including mineralogical testing and chemical analysis; and (d) prepared mineral maps. Besides, preparation of National Inventory of mineral resources is IBM's designated responsibility. The National Mineral Inventory (NMI) is brought out by IBM on a quinquennial basis. UNFC system has been adopted by IBM for resource classification. Updating of NMI of mineral resources in respect of 70 minerals based on UNFC system, as on 1.4.2010, has been completed in March, 2012.

IBM is entrusted with preparation of multimineral maps. About 60 multimineral maps with forest outlays on 1:50,000 scale were prepared in respect of Jammu & Kashmir, Himachal Pradesh, Haryana, West Bengal, NER States, Kerala and Goa during 2011-12 in collaboration with Forest Survey of India. IBM has also conducted 65 ore dressing investigations, 49,139 chemical analysis, 2408 mineralogical studies and one in-plant studies during the year.

Other Agencies

GMDC estimated a total of 139.56 million tonnes of lignite resources in Bhavanagar and Kachchh districts, Gujarat; about 4 million tonnes manganese ore resources in Panchmahals and Vadodara districts.

Hindustan Zinc Ltd (HZL) has estimated about 27.1 million tonnes of lead and zinc ore resources in Rajpura Dariba, Rajsamand district.

Exploration by HGML has established 12.21 million tonnes gold ore reserves (2.50 - 5.26 g/t Au) in Hutti and Hira-Buddini and Uti ML areas in Raichur district of Karnataka.

Singareni Collieries Company Ltd (SCCL) proved 390.24 million tonnes of coal reserves in Godavari Valley Coalfield, Andhra Pradesh, during 2011-12.

NALCO estimated 15 million tonnes of bauxite resources in Panchpatmali mines, Koraput district, Odisha.

Rajasthan State Mines & Minerals Ltd have established 1.12 million tonnes geological resources of rock phosphate.

Reliance Industries Ltd (RIL)

During the year as a part of re-assessment of its portfolio together with BP, RIL has considered 5 blocks as relinquished in its books and initiated the formal process of relinquishing these blocks. In addition to the above, RIL also relinquished 5 additional blocks. Consequently RIL's domestic oil & gas portfolio consists of 17 exploration blocks excluding KG-D6, CBM, Panna Mukta and Tapti.

Coal Bed Methane

A total of 33 CBM blocks have been awarded in various states under four rounds of CBM bidding held so far. The total area awarded hitherto for CBM exploration is about 17,200 sq km. Total prognosticated CBM resource for awarded 33 CBM blocks, is about 63.85 trillion Cu ft (TCF) of which so far, 8.92 TCF has been established as Gas in Place (GIP). Field Development Plan has already been approved for four blocks and is under review for another one block.

RESEARCH & DEVELOPMENT

The Science and Technology (S&T) programmes of the Ministry of Mines, Government of India, cover the disciplines of Geology, Exploration, Mining and Environment, Bioleaching, Beneficiation, Rock Mechanics, Ground Control and Non-ferrous Metallurgy. During 2011-12, a total of nine new projects have been approved by the Standing Scientific Advisory Group (SSAG) of the Ministry of Mines.

The highlights of the work carried out by various research organisations and industries relating to mineral beneficiation and mining & environment during 2011-12 are furnished below:

IRON ORE

1.1 Iron Ore

Beneficiation studies on iron ore sample from SBK Mines, Bellary for M/s Swastik Steels (Hospet) Private Limited (IBM): The as received sample assayed 50.30% Fe(T), 0.53% FeO, 12.85% SiO_2, 8.03% Al_2O_3, 6.02% LOI. By adopting various techniques viz, crushing, screening, tabling and magnetic separation, an iron ore concentrate assaying 63.71% Fe(T), 2.58% SiO_2, 2.31% Al_2O_3 with recovery of 61.1% Fe(T)(Wt% yield of 48.6) could be obtained.

Upgradation of a Low grade Iron Ore from Bellary Hospet, Karnataka for M/s V.S. Lad and Sons (Anil), Sandur (IBM): The as received sample assayed 56.16% Fe (T), 9.10% SiO_2, 4.29% Al_2O_3, 5.07% LOI. By adopting gravity operation and magnetic separation, a composite concentrate assaying 64.22% Fe (T), 3.43% SiO_2, 1.80% Al_2O_3, 2.58% LOI with 64.3% Fe (T) recovery (wt% yield 57.3) was obtained.

Upgradation of dumped Iron Ore from GMIL, Bangaluru (IBM):The as received sample assayed 42.65% Fe (T), 10.65% SiO_2, 13.72% Al_2O_3, 11.77% LOI. Various beneficiation techniques were adopted for upgradation and observed that an usable iron concentrate with +61% Fe content and low value of SiO_2 + Al_2O_3 content could be obtained both by gravity as well as low intensity magnetic separation. However, the iron recovery was low from 25 to 30%.

Upgradation of Iron Ore sample from M/s P.S.L. Holding Pvt. Ltd (IBM): The as received sample assayed 50.25% Fe(T), 11.07% FeO, 62.14% Fe_2O_3, 2.26% Al_2O_3 and 7.98% SiO_2. An iron ore concentrate assaying 67.51% Fe(T), 0.92% Al_2O_3 and 0.40% SiO_2 with 89.1% Fe recovery (Wt% yield 65.3%) could be achieved by subjecting the sample to wet low intensity magnetic separation followed by gravity separation at minus 100 mesh size. The bulk density of the sample was found to be 2.53 tonnes per meter cube. The beneficiation studies indicate that sample is amenable to beneficiation.

Upgradation of a sub-grade iron ore fines from Chitradurga, Karnataka for M/s Gem Laboratories Pvt. Ltd, Bangaluru (IBM): The as received sample assayed 56.74% Fe, 6.97% SiO_2, 5.97% Al_2O_3, 0.38% TiO_2, 0.17% Alkali, 0.07% P_2O_5 and 5.40% LOI. Both generic conventional process and the non-conventional no grind process consisting of screening, dry rare earth high force high intensity magnetic separation of screen over size grinding of non-magneic and screen undersize fractions to -48 mesh followed by desliming and tabling yielded a composite concentrate assaying 64.54% Fe, 2.21% SiO_2, 2.71% Al_2O_3, 0.35% TiO_2 and 3.17% LOI with 55.2% Fe recovery (wt% yield 49.1%). This concentrate meets the party's specification required for pellet grade.

An Iron Ore sample from M/s P.S.L. Holding Private Ltd, Thakhuro Ke Dhani, Jaipur Distt., Rajasthan (IBM): The sample as received assayed 50.25% Fe(T), 11.07% FeO, 62.14% Fe_2O_3, 2.26% Al_2O_3, 7.98% SiO_2,1.58% P and 0.05% S. Wet low intensity magnetic separation followed by gravity concentrate and refining the gravity concentrate by wet low intensity magnetic separation at -100 mesh yielded a composite

magnetic concentrate assaying 69.91% Fe(T), 1.07% SiO_2, 0.68% Al_2O_3, 0.13% P with 75.9% Fe(T) recovery (wt% yield 54.1). This concentrate meets the specification required for the steel industry. Further, when non-magnetic products is subjected to flotation, a phosphate concentrate assaying 18.46% P_2O_5, 2.58% Fe(T), 1.13% SiO_2 and 0.68% Al_2O_3 with a P_2O_5 recovery of 73.4% (wt% yield 27.7) could be obtained. This phosphate concentrate is found to be suitable for direct application to soil and for pig iron industry. In addition, above 15% by weight of mica (-100 + 200 mesh) can also be recovered from the non-magnetic tails sample. Thus, the phosphate concentrate and mica as side products recovered from non-magnetic tails may be conserved and utilised for industrial application.

Low grade iron ore samples and dumped fines were collected from Gua and Meghtaburu mines of SAIL (NML): The dumped fines samples collected from Gua Mines analysed 59.86% Fe/ 4.19% Al_2O_3/4.05% SiO_2. The flow sheet developed indicates that obtaining a sinter fines product of 63% Fe with 39% yield and a pellet fines of 65% Fe with 33% yield is possible by combination of jigging, spiraling and magnetic separation.

Limestone

Upgradation of Low grade Limestone sample from Prism Cement (Limestone Mines) Ltd, Satna, M.P(IBM): The as received sample assayed 36.65% CaO, 2.23% MgO, 20.66% SiO_2, 1.69% Fe_2O_3, 4.34% Al_2O_3, 32.12% LOI. By adopting flotation route a concentrate assaying 45.03% CaO, 2.12% MgO, 1.06% Fe_2O_3, 9.86% SiO_2, 2.49% Al_2O_3 and 38.1% LOI with 90.1% CaO recovery (wt% yield 73.4) could be obtained.

Production of a Limestone concentrate for cement industry on a sample sent by M/s Birla Cement Works, Chittorgarh, Rajasthan (IBM): The as received sample assayed 41.42% CaO, 1.80% MgO, 18.04% SiO_2, 1.39% Fe_2O_3, 32.95% LOI with 73.93% total Carbonates. Flotation at 94% -200 mesh grind produced a limestone concentrate assaying 47.24% CaO, 9.68% SiO_2, 37.98% LOI, 84.36% $CaCO_3$ (TC) with 83.1% CaO recovery (wt% yield 73.6).

Beneficiation studies on two Limestone samples namely Dolomitic and Silicious to obtain a suitable concentrate for utilisation in Cement Industry from Bhagabhalag Limestone Mines of Jaypee Himachal Cement Plant **(IBM):** The siliceous Limestone sample assayed 35.12% CaO, 0.91% MgO , 26.75% SiO_2, 2.11% Fe_2O_3, 3.0% Al_2O_3 and 29.85% LOI. By adopting flotation technique, a second cleaner concentrate assaying 45.60% CaO, 12.71% SiO_2 and 36.84% LOI with a CaO recovery of 82.4% (wt% yield 65.5) could be obtained. This concentrate meets the requirement of cement industry. The other dolomitic Limestone sample assayed 30.12% CaO, 10.37% MgO, 19.90% SiO_2,1.13% Fe_2O_3, 0.93% Al_2O_3 and 35.90% LOI. By adopting flotation technique, a concentrate assaying 34.17% CaO, 10.55% MgO, 9.74% SiO_2 and 40.64% LOI with 84.9% CaO recovery (wt% yield 73.9) could be obtained, which is not suitable for cement industry.

However, this above concentrate may find utilisation in cement making after blending with other high grade concentrate obtained after beneficiation of siliceous limestone sample in the ratio of 40 : 60. The composite limestone concentrate would assay 43.05% CaO, 11.59% SiO_2, 2.83% MgO and 37.81% LOI with a CaO recovery of 80.8% (wt% yield 62.4). This concentrate may find utility in cement industry.

Rock Phosphate

Upgradation of below threshold value of Rock Phosphate sample from M/s MECL for industrial application (IBM): The sample assayed 2.13% P_2O_5, 7.84% CaO, 1.76% MgO, 3.05% Fe_2O_3, 3.47% Al_2O_3, 74.04% SiO_2, 79.47% A.I. and 5.95% LOI. By adopting flotation route, a phosphate concentrate assaying 15.72% P_2O_5 and 18.99% A.I. with P_2O_5 recovery of 66.6% (Wt% yield 8.8) could be obtained. By subjecting the above concentrate to WHIMS and further leaching the non-mag concentrate with 8% dilute acid, a phosphate concentrate assaying 20.05% P_2O_5, 38.14% CaO, 0.36% MgO, 20.18% SiO_2, 21.58% A.I. with P_2O_5 recovery of 62.8% (Wt% yield 6.5) could be obtained. The investigation revealed that phosphate sample assaying 2.1% P_2O_5 which is lesser than the threshold value of minerals for implementation (<5% P_2O_5) can be beneficiable up to 18-20% P_2O_5 with P_2O_5 recovery of 63-67% (Wt% yield: 6.5-7.5).

Silica Sand

***Beneficiation studies on a silica sand sample from Allahabad for M/s Mangalore Minerals (Pvt.) Ltd, Mangalore (IBM)*:** The as received sample assayed 98.48% SiO_2, 0.23% Fe_2O_3, 0.53% Al_2O_3, 0.044% TiO_2, 0.02% K_2O and 0.40% LOI. Various routes i.e, screening, attrition scrubbing and magnetic separation were adopted to achieve the desired grade and the following composite concentrates could be obtained: (i)-30+150 mesh composite concentrate assaying 99.41% SiO_2, 0.059% Fe_2O_3, 0.093% Al_2O_3, 0.01% TiO_2 and 0.024 % LOI with wt% yield 93.9. (ii)Alternative route by grinding the -10+30 mesh sample to all -30 mesh and screening over 150 mesh followed by attrition scrubbing and magnetic separation, a non-magnetic concentrate assaying 99.46% SiO_2, 0.036% Fe_2O_3, 0.090% Al_2O_3 with wt% yield 76.1 was obtained.

Others

In addition to the above, significant R&D work was carried out by NML on iron ore, chromite and clay.

Mining & Environment

National Institute of Rock Mechanics (NIRM)

National Institute of Rock Mechanics (NIRM) is a premier research centre in the field of applied and basic Rock Mechanics & Rock Engineering.

It provides specialised technical services to several industrial sectors like mining – coal & non-coal; civil-hydroelectric & tunneling projects, nuclear power projects, underground storage cavern projects and to other construction industries within India and abroad, stressing upon the need to achieve improved production and productivity, with utmost safety and economy.

Indian Bureau of Mines (IBM)

During the year 2011-12, Indian Bureau of Mines carried out eight studies for environment quality monitoring and six for ground vibration due to blasting in mines.

The study on environmental quality monitoring at Copila Gaichem Paul (Shigao) Iron Ore Mines and Saniem Iron Ore Mines of M/s Fomento Industries (P) Ltd, Goa has been carried out for all the four seasons for 2009 -10 to monitor environmental parameters.

Ground Vibration studies to assess the impact of blasting at Metamangrur Stone Quarry, Umred Tehsil, District Nagpur, Maharashtra (lease area 6.80 ha), Venkatesh Stone Quarry (2.76 ha) at Panchgaon in Umred Tehsil, District Nagpur, Shri Warad Stone Quarry (1.33 ha) near Tip Top Convent, Survey Nagar, Nagpur, and Panchgaon Stone Quarry (2.40 ha) in Umred Tehsil, District Nagpur were carried out to study the impact of blast induced ground vibrations on the nearby structures, human settlement and to suggest control measures to minimise the adverse impact of the same.

INFRASTRUCTURE

One of the major requirements for sustainable and inclusive economic growth is an extensive and efficient infrastructure network. It is critical for the effective functioning of the economy and industry.

Infrastructure has direct bearing on sustainability of growth and overall development and enable generation of considerable background and forward linkages. The prospects of country's socio-economic development depend crucially on the performance of infrastructure, such as, power, roads, railways, ports, irrigation and telecommunications.

The Twelfth Five Year Plan lays special emphasis on development of the infrastructure sector including energy; as the availability of quality infrastructure is important not only for sustaining high growth but also ensuring that the growth is inclusive.

Unbundling of inrastructure projects, public private partnerships (PPP), and more transparent regulatory mehanisms have induced private investors to increase their participation in infrstructure sectors. Their share in infrastructure investment increased from 22% in the Tenth Five Year Plan to 38% in the Eleventh Plan and is expected to be about 48% during the Twelfth Five Year Plan.

The status report or major central-sector projects costing Rs.150 crore and above for the month of September 2012 shows that out of the 566 projects, five were ahead of schedule, 226 on schedule and 258 had been delayed with respect to their latest scheduled date of completion. The remaining projects do not have fixed dates of commissioning. Sector-wise, in the coal sector 21 projects were delayed out of 51, in the petroleum sector 37 out of 71, in the power sector 45 out of 98, in the railways 40 out of 127 and in the road sector 86 out of the total 146 projects. The overall cost over run amounted to 16.8% of the original cost and till September 2012 only 45.5% of the anticipated cost of the projects had been incurred.

Among the infrastructure services, growth in freight traffic by railways has been comparatively higher so far, while the civil aviation sector and cargo handled at major ports have witnessed negative growth. In the road sector, the National Highways Authority of India (NHAI) achieved 17.3% growth during the financial year up to November 2012.

Coal

Coal production at about 540 million tonnes in 2011-12 was higher by 1.4% from that of 533 million tonnes in 2010-11. In 2011-12, out of the total production of coal, 9.6% (51.7 million tonnes) was of coking coal and the remaining 90.4% (488.2 million tonnes) was of non-coking coal. Of the 535 million tonnes despatches of raw coal in 2011-12, about 75% despatches were to electricity sector, 3% to sponge iron industry, 3% to the steel industry and 2.4% to cement industry.

Electricity

Electricity generation by power utilities during 2012-13 was targeted to go up by 6.05% to 930 billion units. The growth in power generation during April to December 2012 was 4.55% as compared to about 9.33% during April to December, 2011.

The Eleventh Five Year Plan initially envisaged a capacity addition of 78,000 MW, of which 19.9% capacity was hydro, 75.8 % thermal and the rest nuclear. At the time of the Mid Term Appraisal of the Eleventh Plan, the target was revised to 62,374 MW with the thermal, hydro and nuclear segments contributing 50,757 MW, 8,237 MW and 3,380 MW, respectively. A capacity addition of 54,964 MW has been achieved during the Eleventh Plan. The capacity addition during the Twelfth Plan period is estimated at 88,537 MW comprising 26,182 MW in the central sector, 15,530 MW in the state sector and 46,825 MW in the private sector, respectively. The capacity addition target for the year 2012-13 was set at 17,956 MW. As against it , a capacity of 9,854 MW has been added till 31 December 2012.

The Ministry of Power launched an initiative for development of coal-based super critical Ultra Mega Power Projects (UMPP) of about 4000 MW capacity each. Four UMPPs viz, Sasan in Madhya Pradesh, Mundra in Gujarat, Krishnapatnam in Andhra Pradesh and Tilaiya in Jharkhand have already been transferred to the identified developers and are at different stages of implementation. Three units of Mundra UMPP each of 800 MW have been commissioned in March, July and October 2012. The fourth and fifth units are expected to achieve commercial operation in May and September 2013. Other awarded UMPPs are expected to come up in the Twelfth Plan (except the last unit of the Tilaiya UMPP, which is likely to come up in the Thirteenth Plan).

Transport

Railways

Indian Railways consist of an extensive network spread over 63,221 route km (Rkm) comprising broad guage (46,807 Rkm), metre guage (13,290 Rkm) and narrow guage (3,124 Rkm). During 2012 (April-November), the total revenue-earning freight traffic moved by Indian Railways grew at 4.7% to 647.1 million tonnes as compared to 618.05 million tonnes in 2011 (April - November). The moderate growth in freight traffic may be attributed not only to the overall slowdown in the economy but also to other factors like a ban on iron ore exports from Karnataka and reduced imports of fertilizers.

Ports

India's coastline of 7,517 km, spread on the western and eastern shelves of the mainland and also along the islands is studded with 13 major ports and about 200 non-major ports. Approximately, 95% of the India's trade by volume and 70% by value moved through Maritime Transport. Twelve major ports of the country handle about 75% traffic.

Cargo handling capacity at major ports was 690 million tpy in 2011-12 as compared to 670 million tpy in 2010-11. Traffic handled by major ports was 560 million tonnes in 2011-12 as compared to 570 million tonnes in 2010-11. Traffic handled at major ports relating to minerals/mineral products during 2011-12 was: POL - 179 million tonnes, iron ore - 60.1 million tonnes, coal - 78.8 million tonnes and fertilizer & raw materials - 20.4 million tonnes.

Roads

India has more than 3.34 million km road network making it one of the largest in the world, comprising 66,754 km National Highways, 128,000 km State Highways, 470,000 km major district roads and about 2,650,000 km other district and rural roads. National Highways are the prime arterial routes throughout the country and cater to about 40% road transport traffic although they comprise only 2% of

the total road length. About 24% of the total length of National Highways (NHs) is single lane/ intermediate lane, about 51% is two lane standard, and the balance 25% is four lane standard or more. In 2012-13, the achievement under various phases of the NHDP up to December, 2012 has been about 1,605 km and projects have been awarded for a total length of about 878 km.

The government approved the Road Requirement Plan (RRP) for development of 1,126 km NHs and 4,351 km state roads (total 5,477 km) to two-lane at a cost of ₹ 7,300 crore in 34 LWE-affected districts in the states of Andhra Pradesh, Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, and Uttar Pradesh. Detailed estimates for 5,419 km length have been sanctioned at an estimated cost of ₹ 7,699 crore out of which works on 5,049 km length costing ₹ 6,853 crore have been awarded. Development in 1960 km length has been completed up to December 2012 and cumulative expenditure incurred so far is ₹ 2,494 crore. The development of roads under the programme is scheduled to be completed by March 2015. RRP-II covering a length of 5,624 km at an estimated cost of Rs.9,400 crore is under consideration of the government.

PERFORMANCE OF SELECTED MINERAL-BASED INDUSTRIES

Steel

Production of finished steel (including C.R. sheets) in 2011-12 at 73.41 million tonnes was higher by about 8.9% from 68.62 million tonnes achieved in 2010-11. The total production of pig iron was 5.7 million tonnes and 5.8 million tonnes in 2010-11 and 2011-12, respectively. Exports of finished steel (including C.R sheet)) was 4.09 million tonnes in 2011-12 as compared to 4.27 million tonnes reported in 2010-11. Also, 0.82 million tonnes and 0.81 million tonnes pig & cast iron, including spiegeleisen was exported in the corresponding periods.

Cement

Production of cement in 2011-12 estimated at 230 million tonnes (including mini cement plants) registered an increase of about 6.5% over the previous year's production of 216 million tonnes. Cement industry was going ahead with modernisation and upgradation of technology in particular to conserve energy. The country is self-sufficient in cement. India exports cement including white cement and clinker. The exports in 2010-11 and 2011-12, including clinker were about 3.5 million tonnes and 3.4 million tonnes, respectively.

Petroleum Oil and Refineries

Crude oil production in 2011-12 at 38.1 million tonnes was about 1.1% higher than 37.7 million tonnes produced in the previous year. The production for natural gas (utilised) was at 47559 million cubic metres (mcm) in 2011-12, 8.9% lower than 52,219 million cubic metres in 2010-11. The refinery crude throughput of 211.42 million tonnes in 2011-12 was 2.6% higher than 206 million tonnes processed in 2010-11. The total refining capacity in the country at around 213.07 million tpy as on 1.4.2012 was about 10.2% higher from that of the preceding year and it is expected that it will reach 218.37 tpy by the end of 2012-13. Production of petroleum products (including LPG production from natural gas) was 198.92 million tonnes in 2011-12 as compared to 192.53 million tonnes reported in 2010-11.

SELF-RELIANCE IN MINERALS & MINERAL-BASED PRODUCTS

India continued to be wholly or largely self-sufficient in minerals which constitute primary mineral raw materials that are supplied to industries, such as, iron & steel, ferro-alloys, aluminium, cement, various types of refractories, china clay-based ceramics, glass, chemicals like caustic soda, soda ash, calcium carbide, titania white pigment, etc. India is self-sufficient in bauxite, chromite, iron ore, ilmenite and rutile among metallic minerals; and almost all the industrial minerals with the exception of chrysotile asbestos, borax, fluorite, potash, rock phosphate and elemental sulphur. Despite high degree of self-sufficiency, some quantities of flaky and amorphous graphite of high fixed carbon, kaolin and ball clay for special applications, very low silica limestone, dead-burnt magnesite and sea water magnesia, battery-grade manganese dioxide, manganese ore, etc. were imported to meet the demand for either blending with locally available mineral raw materials and/or for manufacturing special qualities of mineral-based products. To meet the increasing demand of uncut diamonds, emerald and other precious & semi-precious stones by the domestic cutting and polishing industry, India is dependent on imports of raw uncut stones for their value-added re-exports. The degree of self-sufficiency in respect of various principal minerals and metals/ferro-alloys in 2011-12 is given in Table-4.

Table – 4 : Degree of Self-sufficiency in Principal Minerals & Metals, 2011-12(P)

Sl. No.	Commodity	Demand/Domestic consumption ('000 tonnes)	Supply/Domestic supply ('000 tonnes)	Order of self-sufficiency (%)
Minerals				
1	Asbestos (chrysotile)	104	++	++
2	Barytes	186	1723	100
3	Bauxite	11,888	12877	100
4	Chromite	2390	3764	100
5	Dolomite	6328	5417	86
6	Felspar	452	660	100
7	Fireclay	523	760	100
8	Fluorite	66	5	8
9	Gypsum	8121	6969[1/]	100
10	Ilmenite	190	751	100
11	Iron ore	110982	167289	100
12	Kyanite	4	4	100
13	Limestone & other calcareous minerals	238156	257013[2/]	100
14	Magnesite	216	218	100
15	Manganese ore	4006	2349	59
16	Rock phosphate (including apatite)	3955	2327	59
17	Rutile	25	17	68
18	Sillimanite	13	58	100
19	Silica minerals	1988	5036	100
20	Sulphur	1690	807[3/]	48
21	Talc/steatite/pyrophyllite	368	1198	100
Metals[4/]				
22	Aluminium	2256	1654	73
23	Copper (refined)	440	504	100
24	Lead (primary)	215	92	43
25	Zinc	598	783	100
Ferro-alloys[5/]				
26	Ferro-chrome	287	906	100
27	Ferro-manganese	125	447	100
28	Ferro-silicon	43	127	100

Note: *Even in cases where almost entire domestic demand is satisfied by domestic supplies, some quantities of certain special quality/types of minerals and metals/ferro-alloys are imported to meet the requirement in certain specific end-uses.*

1/ Includes mineral gypsum, by-product marine gypsum and estimated production of by-product phospho-gypsum, based on available information besides selenite.

2/ Excludes production of limestone as a minor mineral, calcite and chalk.

3/ Relates to recovery of by-product sulphur from petroleum refineries and sulphur equivalent of by-product sulphuric acid recovered from copper & zinc smelters consuming indigenous ores and concentrates.

4/ Apparent demand.

5/ Excludes production in small-scale sector.

FOREIGN TRADE

India's merchandise trade increased exponentially in the last decade from US$ 95.1 billion in 2000-01 to US$ 620.9 billion in 2010-11 and further to US$ 793.8 billion in 2011-12. India's share in global exports and imports also increased from 0.7% and 0.8% respectively in 2000 to 1.7% and 2.5% in 2011 as per the WTO. While India's total merchandise trade as a percentage of the gross domestic product (GDP) increased from 28.2% in 2004-05 to 43.2% in 2011-12 as per provisional estimates. India's merchandise exports as a percentage of GDP increased from 11.8% to 16.5% during the same period. India's exports, which had surpassed pre-crisis levels within a year in 2010-11 with a record 40.5% growth, continued growing even in 2011-12, but were finally affected by the global slowdown in 2012-13 with exports declining even more at -4.9% in the first ten months than the -3.5% recorded during the crisis-ridden year of 2009-10 (full year).

Exports

According to the data available, the total exports (including re-exports) of all merchandise in 2010-11 and 2011-12 were ₹11,42,922 crore and ₹14,65,959 crore, respectively. The ores and minerals group (including diamond, precious and semi-precious stones) earned foreign exchange worth ₹1,74,370 crore and ₹1,75,310 crore in 2010-11 and 2011-12 thereby posting an increase of about 0.54%. Contribution of cut diamonds in 2010-11 & 2011-12 was ₹1,34,064 crore and ₹1,33,881 crore while that of iron ore was ₹21,416 crore and ₹22,185 crore, respectively.

The principal ores and minerals exported from India in order of value contribution are diamond (mostly cut), iron ore, alumina, granite and zinc ores and concentrates. Rough diamonds imported into the country are cut and re-exported and these diamonds contributed 76.57% to the total exports of ores and minerals in 2011-12. Iron ore contributed 12.65%, followed by granite 3.64%. The individual share of remaining minerals was less than 1% in the total value of exports of ores and minerals from India in 2011-12.

The export of selected mineral-based products during 2010-11 and 2011-12 was valued at ₹ 2,00,286 crore and ₹ 2,89,436 crore, respectively. The exports of petroleum products, e.g., light distillates (naphtha and others), middle distillates and heavy ends, earned foreign exchange of ₹1,96,861 crore and ₹2,84,644 crore in 2010-11 and 2011-12, respectively, with 98% share in both the years in the export of selected mineral-based products.

India also exported metals and alloys valued at ₹94,052 crore and ₹1,02,500 crore during 2010-11 and 2011-12, respectively. Iron and steel with a share of about 59.2% in the total value of exports of metals and alloys followed by copper & alloys (including brass & bronze) 13.4%, ferro-alloys 8.2%, aluminium, alloys & scrap 7%, zinc & alloys (including scrap) 3.5%, pig & cast iron (including spiegeleisen) 2.7%. precious metals/ metal clad with precious metal 2% and gold (non-monetory & monetory) 1.9% were the principal metals/alloys exported from India in 2011-12.

Imports

The total imports of all merchandise in 2010-11 and 2011-12 were ₹16,83,467 crore and ₹23,45,463 crore, respectively. The value of imports of ores and minerals in 2011-12 increased by 41% to ₹9,44,430 crore from ₹6,69,010 crore in 2010-11. Petroleum (crude) continued to be the largest constituent item of mineral imports with a share of 68% in 2011-12. Its imports in 2011-12 at ₹6,43,688 crore rose by more than 53% over 2010-11. Next in descending order was diamond with a share of about 14%, followed by coal (excluding lignite) 8.3%,natural gas 3.5% and copper ore & concentrates 2.8%.

The import of selected mineral-based products during 2010-11 and 2011-12 was valued at ₹70,091 crore and ₹76,109 crore, respectively. The imports of petroleum products in 2011-12 rose by 4% in value over the preceding year to ₹54,166 crore and had a share of 71% in the value of import of selected mineral-based products during 2011-12.

The value of imports of metals and alloys at ₹4,18,310 crore showed an increase of 45.8% in 2011-12 from ₹2,86,835 crore in 2010-11. Share of gold imports was about 64.5% in terms of value, followed by iron & steel (19.5%), silver (5.9%), aluminium alloys & scrap (3.4%) and copper & alloys (3.0%).

VALUE-ADDED EXPORT TRADE

India's foreign trade includes exports of minerals, both in the raw form and semi-processed & processed forms like mineral-based primary manufactured products.

Minerals contributed significantly to India's exports trade in 2011-12 with a share of about 12%(i.e., ₹1,75,310 crore) in the total value of all merchandise. The contribution of minerals in exports in raw/unprocessed forms was about ₹32,179 crore and in semi-processed/processed forms was about ₹1,43,130 crore. The manufactured mineral-based products contributed about ₹3,90,027 crore in 2011-12 to the total value of exports of all merchandise. The value-added semi-processed/processed minerals figuring in India's foreign trade included cut and polished diamond/ emerald, etc., pulverised barytes, steatite, felspar (cut), garnet, calcined magnesite, magnesia (fused), magnesite (dead-burnt), magnesium oxide, slate (worked), processed mica and manufactured mica products, coke, cut and polished dimension stones, alumina, etc. The manufactured mineral-based commodities included metals and alloys and products thereof, cement, firebricks and other refractory materials, clay-bonded graphite crucibles and silicon carbide crucibles, manganese dioxide, asbestos-cement products, inorganic chemicals like lime and fluorine chemicals, refined borax and borates, elemental phosphorus and phosphoric acid, titanium dioxide, petroleum products, phosphatic and potash fertilizers, etc. Table-5 provides data on contribution of various value-added minerals and mineral-based products to India's exports during 2009-10 to 2011-12.

Table – 5 : Contribution of Value-added (Processed) Minerals & Mineral-based Products in India's Export* Trade, 2009-10 to 2011-12

Sl. No.	Commodity group	Value of exports (₹ million)			Contribution (percentage)		
		2009-10	2010-11	2011-12	2009-10	2010-11	2011-12
1.	All Merchandise	8455336	11429219	14659593	100.00	100.00	100.00
2.	Minerals	1278311	1743704	1753095	15.1	15.2	11.9
	2.1 Raw/Unprocessed form	54175	296189	321792	4.2	2.6	2.2
	2.2. Semi-processed/ processed forms (preliminary and intermediate stages of processing)	924136	1447515	1431303	10.9	12.7	9.8
3.	Manufactured Mineral-based Commodities (final stage of transformation)	2039239	2935184	3900278	24.1	24.7	26.6
	3.1 Metals/Alloys	579754	940524	1024998	6.8	8.2	7.0
	3.2 Others	1459485	1994660	2875280	17.3	17.4	19.6

Figures rounded off.
** Including re-exports.*