Income and Employment Generation through Mining Industry in India

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May 2021

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Abstract

India is well endowed with natural resources, particularly minerals, which serve as raw material for many industries, paving a path for rapid industrialization and infrastructural development. This, in turn, will facilitate the economy's ascent to a path of sustained growth and a five trillion dollar economy. Mining is an important economic activity in India. India is one of the largest exporters of iron ore, chromite, bauxite, mica and manganese, and it is ranked fifth among the mineral-producing countries in terms of volume of production. The mining sector contributes nearly 2.4 per cent to India's GDP. While there has been private sector participation in mining, the government through its various public-sector companies continues to be the largest participant in the domestic mining industry.

Much of India's potential mineral resources are yet to be fully explored. Earlier, government policies and legislation had largely focused on regulation of mines and minerals rather than on exploration and development. Taking cognisance of the stagnation of the mineral industry, various reforms have been initiated by the Indian government allowing for greater private sector participation in mineral exploration, mine development and maintenance. The present study throws a light on mineral production, value and share of states in value of mineral production, contribution of mining to the Indian GDP and average daily labour employed in manganese and iron ore sectors in India.

Key words: Mining, Manganese and Iron ore, Production, Labour employed and GDP.

1. Introduction:

Many of us are familiar with the word 'mineral', but few are aware what precisely constitutes a mineral. Opinions differ from man to man, regarding the nature of the substance to which the name 'mineral' is applied. In the technical sense, the mineral is a substance having a definite chemical composition and atomic structures and formed by inorganic processes of nature. In a popular sense, the term 'mineral is applied to any substance that is extracted from the earth by mining and as such includes not only metals, ores, coal and

petroleum, but also like stones, slabs, roofing slates and road metal extracted by quarrying, which we commonly call rocks or stones.

The mining industry is involved in the extraction of precious minerals and other geological materials. The extracted materials are transformed into a mineralized form that serves an economic benefit to the prospector or miner. Typical activities in the mining industry include metals production, metals investing, and metals trading.

Since independence, there has been a pronounced growth in the mineral production both in terms of quantity and value. India produces as many as 95 minerals, which includes 4 fuel, 10 metallic, 23 non-metallic, 3 atomic and 55 minor minerals. The total value of mineral production (excluding atomic & fuel minerals) during 2019-20 has been estimated at Rs.1,23,588 crore, which shows a decrease of about 3% over that of the previous year. During 2019-20, estimated value for metallic minerals is Rs. 60,822 crore or 49.21% of the total value and non-metallic minerals including minor minerals is Rs. 62,766 crore or 50.79% of the total value.

2. Mineral Production

The total value of mineral production (excluding atomic & fuel minerals) during 2018-19 has been estimated at 1, 24,020 crore, which shows an increase of about 10.11% over that of the previous year. During 2018-19, estimated value for metallic minerals is Rs.61,009 crore or 49.19% of the total value and non-metallic minerals including minor minerals is Rs.63,011 crore or 50.81% of the total value.

Mineral production in India has also surged, achieving a CAGR of 5.72 per cent between 2013-14 and 2017-18E to reach US$ 17.62 billion in 2017-18. The number of operative mines (excluding atomic minerals, petroleum (crude), natural gas (utilized) and minor minerals) in India have increased to an estimated 1,531 in 2017-18 from 1,508 in 2016-17.

3. Value of Mineral Production by States in India

The value of mineral production in India covering metallic, non- metallic and minor minerals touched the level of Rs. 1,12,632 crore in 2017-18 from last 7 decades since 1947. During 2017-18, production of principal minerals like coal, lignite, petroleum (crude), bauxite, chromite, copper ore & concentrates, iron ore, lead & zinc concentrates, manganese

ore, silver, diamond, limestone, phosphorite, sillimanite etc. has gone up whereas it declined in case of gold, kyanite etc. as compared with that of 1947.

The index of mineral production (base 2011-12=100) has increased from 102.5 in 2016-17 to 104.9 in 2017-18 showing an increase of 2.3% as compared to the previous year. The value of mineral production in different states in India is summarized in the table 1.

Table - 1
Value of Mineral Production by States in India
(Rs Crore)

State	2008-09	2017-18
India	**174133**	**112632**
Andhra Pradesh	16498	10465
Assam	8702	78
Bihar	134	4274
Chhattisgarh	13270	9818
Gujarat	12608	6452
Jharkhand	10811	2111
Karnataka	6696	9501
Kerala	954	2262
Madhya Pradesh	10850	3238
Maharashtra	6173	5401
Meghalaya	1318	286
Odisha	17728	20177
Rajasthan	6909	20887
Tamil Nadu	4070	1004
Telangana	*	8282
Uttar Pradesh	3634	5674
West Bengal	3432	146
Off-Shore	44297	--
Others	5718	2576

Source: Indian Mineral Industry at a Glance, 2020.

* State came into existence with effect from 2nd June 2014

Table –1 states the value of mineral production by states. State-wise analysis revealed that during 2017-18, the value of mineral production (excluding fuel & atomic minerals) have shown a mixed trend as compared to that in the 2017-18. The States which have indicated major increase in the value of mineral production are Bihar, Karnataka, Kerala, Odisha, Rajasthan and Uttar Pradesh. However, rest of the principal mineral producing States recorded decrease in value of mineral production (excluding fuel & atomic minerals) in 2008-09 as well as in 2017-18.

4. Share of States in Value of Mineral Production

During 2018-19, Mineral production was reported from 32 States/Union Territories (actual reporting of MCDR from 22 states and estimation of minor minerals for all 32 States/Union Territories) of which the bulk of value of mineral production (excluding fuel and atomic minerals) of about 90.78% was confined to 10 States. Odisha is in leading position, in terms of estimated value of mineral production in the country and had the share of 23.66% in the national output. Next in order was Rajasthan with a share of 17.27% followed by Andhra Pradesh (8.62%), Chhattisgarh (8.49%), Karnataka (8.37%), Telangana (6.73%), Gujarat (5.20%) in the total value of mineral production. The contribution of States/Regions in the value of mineral production during 2018-19 estimated is pictorially shown in the table 2.

Table - 2
Share of States in Value of Mineral Production 2018-19
(Excluding Atomic & Fuel Minerals)

Name of the State	% of Share
Odisha	24
Rajasthan	17
Andhra Pradesh	9
Chhattisgarh	9
Karnataka	8
Telanga	7
Uttar Pradesh	5
Gujrat	5
Maharashtra	4
Bihar	3
Remaining States	9

Source: Government of India, Ministry of Mines, Annual Report - 2018-19.

5. Value of Mineral Production by Sector wise

The Ministry of Mines (MoM), Government of India is responsible for the entire minerals and mining sector in the country that includes legislation, administration, policy formulation etc. in respect of all mines and minerals other than coal, natural gas and petroleum, but including offshore minerals. In India, the minerals are classified as minor minerals and non-minor (i.e. major minerals). The policy and legislation relating to minor minerals is entirely delegated to the state governments while policy and legislation relating to the major minerals is dealt by the MoM. All the mineral legislations in the country conform to the provisions of the MMDR Act, 1957. MoM through its attached office, Geological Survey of India (GSI) facilitates exploration, geological mapping and mineral resource assessment in the country. Indian Bureau of Mines (IBM), a subordinate office of the MoM is mainly responsible for regulation of mining in the country. The Ministry also

administers the Offshore Areas Mineral (Development and Regulation) Act, 2002 and rules made there under. Mineral concessions in India are granted to Indian nationals or entities incorporated in India only. The details of value of mineral production by public sector and private sector from 2008-09 to 2017-18 is summarised in the table 3.

Table - 3
Value of Mineral Production by Sector wise from 2008-09 to 2017-18
(Rs. Crore)

Year	Public Sector	Private Sector	Total
2008-09	115240	58893	174133
2009-10	121794	70321	192115
2010-11	141000	126032	267032
2011-12	152452	131697	284149
2012-13	156695	123311	280006
2013-14	167886	109474	277360
2014-15*#$*	106446	86800	194665
2015-16*$$*	13357	81831	95188
2016-17*$$*	15119	86664	101783
2017-18*$$*	19155	93476	112632

Source: IBM Annual Report 2018-19
#: Excludes the data of 31 minerals for February and March 2015, declared as Minor Minerals vide Notification dated 10th February 2015
$: Excludes the value of Petroleum (crude) & Natural Gas (utilised)
$$: Excludes the value of fuel minerals

Table 3 reveals that mineral production trend in the public sector was moving upward from 2008-09 to 2013-14, from 2014-15 onwards it was moving downward, while in the private sector also mineral production moving upward from 2008-09 to 2011-12 then onwards it was moving downward. Total mineral production trend has also shown a mixed trend, from 2008-09 to 2011-12 moving upward and then onwards starting declining.

6. Mineral Production in India from 1947 to 2017-18

The value of mineral production in India covering metallic, non-metallic and minor minerals touched the level of Rs. 1,12,632 crore in 2017-18 from last 7 decades since 1947. During 2017-18, production of principal minerals like coal, lignite, petroleum (crude), bauxite, chromite, copper ore & concentrates, iron ore, lead & zinc concentrates, manganese ore, silver, diamond, limestone, phosphorite, sillimanite etc. has gone up whereas it declined in case of gold, kyanite etc. as compared with that of 1947. The index of mineral production

(base 2011-12=100) has increased from 102.5 in 2016-17 to 104.9 in 2017-18 showing an increase of 2.3% as compared to the previous year.

In 2017-18, the value of production of metallic minerals was Rs. 50,440 crore or about 86% while that of non-metallic minerals it was Rs. 8,197 crore or 14% of the total value of MCDR minerals. Of the total value of MCDR minerals in India during 2017-18, Public Sector accounted for around 33% whereas Private Sector contributed 67% of the total value. The total number of reporting mines in 2017-18 (excluding atomic, fuel and minor minerals) was 1,430. Of these, 638 mines belonged to metallic minerals and 792 to non-metallic minerals. The detail of the same is highlighted in the table 4.

Table - 4
Decennial Growth in the Value of Mineral Production 1947 to 2017-18
(Rs. in Crore)

Year	Fuels	Metallic Minerals	Non-Metallic and Minor Minerals	Total
1947	45	7	6	58
1957	85	30	12	127
1967	260	47	63	370
1977	1076	192	211	1479
1987	10539	731	951	12221
1997-98	36498	3284	4411	44193
2007-08	102119	29182	28357	159658
2017-18$	N.A.	50440	62192	112632

Source: IBM Annual Reports.
$: Excludes the value of fuel minerals for 2017-18

7. Contribution of Mining to the Indian GDP.

The Mining industry in India is a major economic activity which contributes significantly to the economy of India. The GDP contribution of the mining industry varies from 2.2% to 2.5% only but going by the GDP of the total industrial sector it contributes around 10% to 11%. Even mining done on small scale contributes 6% to the entire cost of mineral production. Indian mining industry provides job opportunities to around 700,000 individuals. The details of total GDP and GDP from Mining & Quarrying is stated in table 5.

Table – 5

Gross Domestic Product (GDP) at Current Prices

(Rs Crore)

Year	Total GDP	Mining & Quarrying	Percentage
2008-09	5303566	139828	2.6
2009-10	6108903	159304	2.6
2010-11	7248860	204866	2.8
2011-12	8391691	222716	2.7
2012-13	9252051	284771	3.1
Gross Value Added (GVA) at Current Prices			**(Rs Crore)**
Year	**Total GVA**	**Mining & Quarrying**	**Percentage**
2013-14 (NS)	10380813	295978	2.9
2014-15(NS)	11481794	314177	2.7
2015-16(NS)	12566646	301230	2.4
2016-17(NS)	13841591	332947	2.4
2017-18(PE)	15182317	374689	2.5

Source: Ministry of mines, mineral and mining industry in India January, 2020"
(NS): New series
(PE): Provisional estimates

8. Contribution and Rank of India in World Production of Principal Minerals & Metals.

India's ranking in 2017 in world production was 3rd in aluminium, steel (crude/liquid) & zinc (slab); 4th in chromite, iron ore, and lead (refined); 5th in bauxite, 6th in copper (refined), 7th in manganese ore, 14th in magnesite and 16th in apatite & rock phosphate. The statistics on indigenous and world production of principal minerals and metals are detailed in Table 6.

Table - 6
Contribution and Rank of India in World Production of Principal Minerals & Metals, 2017

Commodity	Unit of quantity	Production		Contribution (Percentage)	India's rank in order of quantum of production
		World	India (2017)		
Metallic Minerals					
Bauxite	'000 tonne	303800	22313	7.34	5th
Chromite	'000 tonne	37500	3481	9.28	4th
Iron ore	Million tonne	3332	201	6.03	4th
Manganese ore	'000 tonne	51600	2589	5.02	7th
Industrial Minerals					
Magnesite	'000 tonne	28700	195	0.68	14th
Apatite & rock phosphate	'000 tonne	253000	1534	0.61	16th
Metals					
Aluminium (Primary)	'000 tonne	60100	3401	5.65	4th
Copper (refined)	'000 tonne	23600	830	3.52	6th
Steel (crude/liquid)	Million tonne	1689	102.34	6.06	3rd

Lead (refined)	'000 tonne	11300	565	5.00	4th
Zinc (slab)	'000 tonne	13700	791	5.77	3rd

Source: World mineral production data compiled from World Mineral Production, 2012-2017; British Geological Survey.

Note: (i) Data in respect of World Mineral Production is on calendar year basis; however the data on India's production is based on financial year.

(ii) Due to non availability of production data of minor mineral, they have not been included in the Table.

9. Production of Manganese Ore and Average Daily Labour Employed in Manganese sector in India

Manganese is an important mineral which is used for making iron and steel and it acts as a basic raw material for manufacturing its alloy. Nearly 6 kilograms of manganese is required for manufacturing one tonne of steel. It is also used for the manufacture of bleaching powder, insecticides, paints, batteries and china-clay.

India is the world's fifth largest producer of manganese ore after Brazil, Gabon, South Africa and Australia. Production of manganese ore in India remains more or less static, with slight variations from year to year. Maharashtra, Madhya Pradesh, Odisha, Andhra Pradesh and Karnataka are the major manganese ore producing states in India.

Table - 7
Production of Manganese Ore from 2008-09 to 2017-18

Year	No. of Mines	Quantity ('000 tonne)	Value (Rs Crore)	Average Daily Labour Employed
2008-09	149	2789	1774	13796
2009-10	142	2492	1191	13806
2010-11	149	3056	1468	13682
2011-12	145	2412	1178	14258
2012-13	172	2342	1284	15550
2013-14	163	2626	1518	16659
2014-15	161	2369	1366	15504
2015-16	146	2167	855	12990
2016-17	153	2395	1625	12505
2017-18	143	2589	1972	12444

Source: Indian Mineral Industry at a Glance,2020.

Table -7 reveals that the production of manganese ore showed fluctuating trend during the decade and touched the highest level of 3.1 million tonnes in 2010-11 and was at 2.6 million tonnes in 2017-18 with an increase of about 8% as compared to the previous year. Madhya Pradesh is the leading manganese ore producing State accounted for 32% of the total production in 2017-18. Next in the order of production were Maharashtra (28%) and Odisha (20%). The average daily employment of labour in manganese ore mines was 12,444 in 2017-18 as against 12,505 in the previous year.

10. Production of Iron Ore in India from 2008-09 to 2017-18

India is one of the leading producers of iron ore in the world. Among the consuming industries, Cement Industry is the second major consumer of iron ore after Iron & Steel Industry (including Sponge Iron Industry).In order to conserve iron ore resources of the country for long-term domestic value addition, export duty on iron ore for both lumps and fines varieties of 58% Fe content and above (except pellets) is at 30% ad valorem.

The Ministry of Steel under Government of India has recently introduced the new National Steel Policy, 2017 and with the roll out of the National Steel Policy, 2017 and the DMI & SP policy, it is envisaged that the industry can be steered with appropriate policy support in creating an environment for promoting domestic steel and thereby ensuring a scenario where production meets the anticipated pace of growth in consumption. Thus, the Indian Steel Sector is all set to achieve its vision thereby setting a global benchmark in terms of quality, standards and technology. It is anticipated that crude steel capacity of 300 million tonnes will be required by 2030-31. However, achieving crude steel capacity up to 300 million tonnes will require extensive mobilisation of natural resources, finances, manpower and infrastructure including land. To address the concerns regarding availability of raw material (Iron ore) intensive & deeper exploration would have to be promoted for augmentation of resource base. Eco-friendly viable underground mining techniques for optimal utilisation of magnetite ore deposits locked in Western Ghats would also have to be explored in conjunction with mining research institutes. The Government has already promulgated the Mines and Minerals (Development and Regulation) Amendment Act, 2015 and therein has laid great emphasis on time bound mine development with increased stress on mineral exploration and sustainable mining operations.

The Act has brought clarity on mine allocation process (through auction) and procedures for mining lease renewal. The Act, further, provides for reservation of any particular mine for a particular end use and put conditions permitting auction among such eligible end users. The details of Production of Iron Ore in India from 2008-09 to 2017-18 is presented in table 8.

Table – 8
Production of Iron Ore in India from 2008-09 to 2017-18

Year	No. of Mines	Quantity (Lakh tonnes)	Value (Rs Crore)	Labour Employed (Average Daily)
2008-09	328	2130	28544	42702
2009-10	320	2186	26462	43557

2010-11	336	2072	39614	46147
2011-12	309	1686	38357	46673
2012-13	310	1366	32824	42645
2013-14	322	1522	31649	39127
2014-15	320	1293	27664	39243
2015-16	330	1581	22321	42065
2016-17	318	1946	25229	45383
2017-18	294	2010	34263	44949

Source: Indian Mineral Industry at a Glance 2017-18

Table 8 reveals that there is a fluctuating trend in the number of mines, the quantity of ore production and average daily labour employed. The variation trend may be influenced by ore demand at the national and international market. As far as a number of mines fluctuation is concerned, these depend on subject to forest and environment clearance from the authorities.

Conclusion:

Mining Industry represents one of man's earliest activities and with time, the use of minerals has increased both in volume and variety to meet a wide range of demands of society. The result is that present-day society, especially in emerging economies like India is crucially dependent on the minerals industry for sustained economic progress that will alleviate poverty and improve the quality of life. In these circumstances, sustainable mineral development boils down to bring about a balance between economic, social and environmental well-being now and for the future. Achieving a dynamic balance between supply and demand for minerals, good governance and environmental management, economic and social stability and intra-generational and inter-generational equity is the challenge that India faces today for the development of its mineral sector. So, the role of authorities who are responsible for strict implementation of the law is very important and they should act in such a way to produce maximum quantity without violating the environment and regulatory laws.

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