

Government of India Ministry of Mines



ANNUAL REPORT 2018-19



<https://mines.gov.in>





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Ministry of Mines

Website Addresses:

Ministry of Mines	: https://mines.gov.in
Geological Survey of India	: www.portal.gsi.gov.in
Indian Bureau of Mines	: www.ibm.nic.in
National Aluminium Company Limited	: www.nalcoindia.com
Hindustan Copper Limited	: www.hindustancopper.com
Mineral Exploration Corporation Limited	: www.meclindia.com
Jawaharlal Nehru Aluminium Research Development and Design Centre	: www.jnarddc.gov.in
National Institute of Rock Mechanics	: www.nirm.gov.in
National Institute of Miners' Health	: www.nimh.gov.in



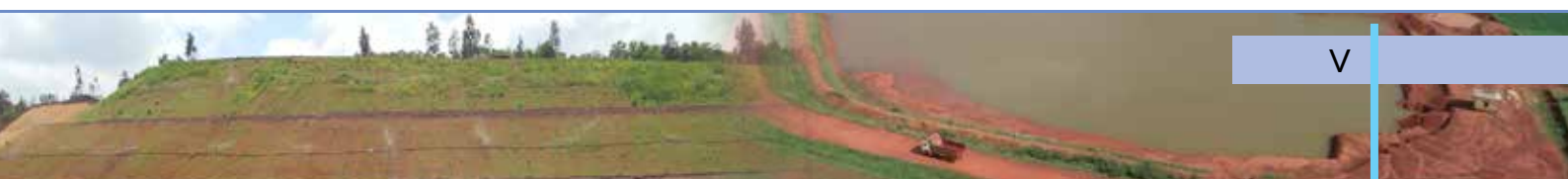
Abbreviations

ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
BALCO	Bharat Aluminium Company Limited
BGML	Bharat Gold Mines Limited
BISAG	Bhaskaracharya Institute for Space Applications and Geo-informatics
CBM	Coal Bed Methane
CCEC	Central Coordination-Cum-Empowered Committee
CCoM	Chief Controller of Mines
CGPB	Central Geological Programming Board
CHQ	Central Head Quarter
CII	Confederation of Indian Industry
CMPDIL	Central Mine Planning & Design Institute
CMR	Coal Mines Regulations
CoI	Commission & Inquiry
CoM	Controller of Mines
CPGRAMS	Centralised Public Grievance Redressal and Monitoring System
CPPP	Central Public Procurement Portal
CSO	Central Statistical Office
CSR	Corporate Social Responsibility
DCoM	Deputy Controller of Mines
DGCA	Directorate General of Civil Aviation
DGCI&S	Directorate General of Commercial Intelligence and Statistics
DGM	Directorate of Geology & Mining
DGMS	Directorate General of Mines Safety
DGR	Draft Geological Report
DMF	District Mineral Foundation
DRDO	Defence Research and Development Organisation
DRM	District Resources Maps
EC	Environmental Clearance

EEZ	Exclusive Economic Zone
EIA	Environment Impact Assessment
EPMA	Electron Probe Micro Analyser
EPS	Enterprises Procurement System
FC	Forest Clearance
FGR	Final Geological Report
FICCI	Federation of Indian Chamber of Commerce and Industry
FIMI	Federation of Indian Mineral Industries
FMCP	Final Mine Closure Plan
FS	Field Season
FSPMIS	Field Season Project Management Information System
GA	Geoscience Australia
GAIL	Gas Authority of India Limited
GCP	Gujarat Copper Project
GMS	Geological Map Series
GPM	Geophysical Mapping
GQM	Geological Quadrangle Maps
GSI	Geological Survey of India
GSITI	Geological Survey of India Training Institute
GTV	Geotechnical Vessel
HCL	Hindustan Copper Limited
HGSS	Heliborne Geophysical Survey System
HINDALCO	Hindustan Aluminium Company Limited
HoD	Head of the Department
HPC	High Power Committee
IBM	Indian Bureau of Mines
ICMM	International Council of Mining and Metals
ICT	Information and Communication Technology
IDCOL	Industrial Development Corporation of Odisha Limited
IGC	International Geological Congress



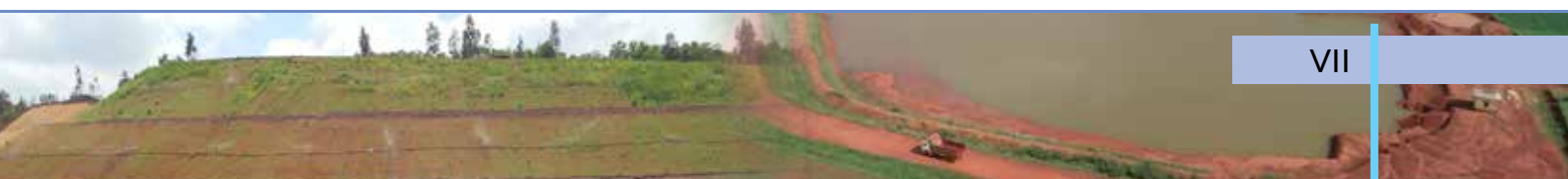
IGCP	International Geoscience Programme
IMYB	Indian Mineral Year Book
IES	Indian Economic Service
INSA	Indian National Science Academy
ISRO	Indian Space Research Organisation
ISTM	Institute of Secretariat Training and Management
IUCN	International Union for Conservation of Nature and Natural Resources
JNARDDC	Jawaharlal Nehru Aluminium Research Development and Design Centre
JWG	Joint Working Group
KCC	Khetri Copper Complex
LME	London Metal Exchange
LOI	Letter of Intent
MCAS	Mineral Concession and Approval System
MCDR	Mineral Conservation & Development Rules
MCP	Malanjkhand Copper Project
MCR	Mineral Concession Rules
MECL	Mineral Exploration Corporation Limited
MECON	Metallurgical & Engineering Consultants (India) Limited
ML	Mining Lease
MMDR Act	Mines & Minerals (Development and Regulation) Act, 1957
MNRE	Ministry of New and Renewable Energy
MSMP	Monthly Statistics of Mineral Production
MoC	Ministry of Coal
MoEFCC	Ministry of Environment, Forest and Climate Change
MoES	Ministry of Earth Sciences
MOIL	Manganese Ore India Limited
MoM	Ministry of Mines
MoTA	Ministry of Tribal Affairs
MoU	Memorandum of Understanding
MSDE	Ministry of Skill Development and Entrepreneurship



MSS	Mining Surveillance System
MTS	Mining Tenement System
MSTC	Metal Scrap Trading Corporation Limited
NALCO	National Aluminium Company Limited
NAGMP	National Aerogeophysical Mapping Project
NCMT	National Centre for Mineral Targeting
NDSAP	National Data Sharing and Accessibility Policy
NER	North Eastern Region
NFTDC	Non-Ferrous Materials Technology Development Centre
NGCM	National Geochemical Mapping
NGIS	National Geo-Spatial Information System
NGDR	National Geoscience Data Repository
NIMH	National Institute of Miners' Health
NIRM	National Institute of Rock Mechanics
NLSM	National Landslide Susceptibility Mapping
NMEEE	National Mission for Enhanced Energy Efficiency
NMEP	National Mineral Exploration Policy
NMET	National Mineral Exploration Trust
NMI	National Mineral Inventory
NMP	National Mineral Policy
NPCIL	Nuclear Power Corporation of India Limited
NRSC	National Remote Sensing Centre
NSDC	National Skill Development Corporation
NSDI	National Spatial Data Infrastructure
OAMDR	Offshore Areas Mineral (Development & Regulations) Act, 2012
OCBIS	Online Core Business Integrated System
OGP	Obvious Geological Potential
OGRV	Oceanographic Research Vessel
OMC	Odisha Mining Corporation
ONGC	Oil & Natural Gas Corporation



PDAC	Prospectors and Developers' Association of Canada
PERC	Project Evaluation and Review Committee
PGE	Platinoid Group of Elements
PL	Prospecting Licence
PLCP	Pre-Legislative Consultation Policy
PMCP	Progressive Mine Closure Plan
PMKKKY	Pradhan Mantri Khanij Khsetra Kalyan Yojana
PRAGATI	Pro-Active Governance and Timely Implementation
PwDs	Persons with Disabilities
RA	Revision Application
RCoM	Regional Controller of Mines
REE	Rare Earth Elements
REY	Rare Earth Yttrium
RHQ	Regional Head Quarter
RMDS	Regional Mineral Development Studies
RP	Reconnaissance Permit
RQP	Recognised Qualified Persons
RSAS	Remote Sensing and Aerial Survey
RSMML	Rajasthan State Mines & Mineral Ltd.
RTI	Right to Information
SAC	Standing Audit Committee
SAIL	Steel Authority of India Ltd.
SBICAPS	SBI Capital Markets
SCEC	State Coordination-Cum-Empowered Committee
SCMS	Skill Council for the Mining Sector
SCPP	Standing Committee on Promotional Projects
SDF	Sustainable Development Framework
SEGEMAR	Servicio Geologico Minero Argentino
SGM	Systematic Geological Mapping
SGPB	State Geological Programming Board.



SMIORE	Sandur Manganese & Iron Ores
SoP	Standard Operating Procedure
SSAG	Standing Scientific Advisory Group
STM	Specialised Thematic Mapping
SU	State Unit
TAMRA	Transparency, Auction Monitoring and Resource Augmentation
TERI	The Energy and Resources Institute
TL	Thermo Luminescence
TOASS	Twin Otter Airborne Survey System
ToR	Terms of Reference
TW	Territorial Water
UCIL	Uranium Corporation of India Ltd.
UNFC	United Nations Framework Classification
VAL	Vedanta Aluminium Limited
VAQ	Visibility, Activity & Quality
WEGs	Wind Energy Generator
WOCS	Working Office-cum-Secretariat
WPI	Wholesale Price Index



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Ministry of Mines: An Overview

Ministry of Mines An Overview

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1.1 Vision

- (i) Minerals are a valuable natural resource being the vital raw material for the core sectors of the economy. Exploration, extraction and management of minerals have to be guided by national goals and perspectives, to be integrated into the overall strategy of the country's economic development. Endeavour shall be to promote domestic industry, reduce import dependency, and feed into Make in India initiative.
- (ii) Natural resources, including minerals, are a shared inheritance where the State is a trustee on behalf of the people and therefore it is imperative that allocation of mineral resources is done in a fair and transparent manner to ensure equitable distribution of mineral wealth to sub-serve the common good. Mining needs to be carried out in an environmentally sustainable manner keeping stakeholders' participation, and devolution of benefits to the mining affected persons with the overall objective of maintaining high level of trust between all stakeholders.
- (iii) It shall also be ensured that the regulatory environment is conducive to ease of doing business with simpler, transparent and time-bound procedures for obtaining clearances. Since mining contributes significantly to state revenues, there is a need for an efficient regulatory mechanism with high penetration of e-governance systems to prevent illegal mining and value leakages. Mining contributes significantly to employment generation, thus, there shall be a keen focus on gender sensitivity in the

mining sector at all levels. Endeavour shall be made to set up a unified authority at national level for mineral development and coordination to fulfill objectives of this policy.



Lighting of the Lamp by Shri Narendra Singh Tomer Hon'ble Minister of Mines during the inauguration of the National Workshop on DMF/PMKKKY held on 18th January, 2019 in New Delhi

Role and Organisation of the Ministry

Main Functions

1.2 Ministry of Mines is responsible for survey and exploration and mining of all minerals, other than natural gas, petroleum, atomic minerals and coal. In the case of atomic minerals and coal, activities of the Ministry are limited to regional exploration. The Ministry is responsible for the administration of the Mines and Minerals (Development and Regulation) Act, 1957, (67 of 1957) and rules made there under in respect of all mines and minerals other than coal, natural gas and petroleum. The Ministry also administers the Offshore Areas Mineral (Development and Regulation) Act, 2002 and rules made there under.

1.3 List of Subjects Allocated to the Ministry of Mines:

- (a) Legislation for regulation of mines and



Parliamentary Consultative Committee Meeting held on 21st January, 2019 at Gujarat

development of minerals within the territory of India, including mines and minerals underlying the ocean within the territorial waters or the continental shelf, or the exclusive economic zone and other maritime zones of India as may be specified, from time to time by or under any law made by Parliament.

- (b) Regulation of mines and development of minerals other than coal, lignite and sand for stowing and any other mineral declared as prescribed substances for the purpose of the Atomic Energy Act, 1962 (33 of 1962) under the control of the Union as declared by law, including questions concerning regulation and development of minerals in various States and the matters connected therewith or incidental thereto.
- (c) All other metals and minerals not specifically allotted to any other Ministry/Department, such as aluminium, zinc, copper, gold, diamonds, lead and nickel.
- (d) Planning, development and control of and assistance to all industries dealt with by the Ministry.
- (e) Administration and management of Geological Survey of India.
- (f) Administration and management of

Indian Bureau of Mines.

- (g) Metallurgical grade silicon.

Attached Office / Subordinate Office:

1.4 Geological Survey of India (Headquarters at Kolkata) is an attached office and Indian Bureau of Mines (Headquarters at Nagpur) is a subordinate office of the Ministry.

Public Sector Undertakings

1.5 There are three Public Sector Undertakings under the Ministry of Mines, namely:-



National Workshop on DMF/PMKKKY held on 18th January, 2019 at New Delhi

- National Aluminium Company Limited (NALCO), Bhubaneswar
- Hindustan Copper Limited (HCL), Kolkata
- Mineral Exploration Corporation Limited (MECL), Nagpur

Autonomous Bodies

1.6 There are three Research Institutions which are Autonomous Bodies of this Ministry:

- Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur;

- National Institute of Rock Mechanics (NIRM), Bengaluru, and;
- National Institute of Miners' Health (NIMH), Nagpur.

Organisational Structure

1.7 The Ministry of Mines was headed by Shri Narendra Singh Tomar as Minister of Mines and Shri Haribhai Parthibhai Chaudhary as Minister of State during the period of the report.

1.8 The Secretariat of Ministry of Mines is headed by the Secretary assisted by one Additional Secretary, three Joint Secretaries, one Joint Secretary & Financial Adviser (common for Ministry of Coal, and Ministry of Mines), one Economic Adviser and eight Directors / Deputy Secretaries; one Director, one Deputy Director and one Assistant Director of IES. Sanctioned strength and present incumbency of officers/officials in the Ministry of Mines is given at **Table 1.1**. Organisational structure of the Ministry of Mines is shown in **Annexure 1.1. (Page No. 185)**.



Automatic Water Sprinklers on Road

Contribution to GDP

1.9 The provisional estimates of Gross Value Added (at 2011-12 prices) accrued from mining and quarrying sector for 2018-19 is at ₹370,564 crore. Similarly, the provisional estimates of GVA (at current prices) for 2018-19 is at ₹410,151 crore. The mining and quarrying sector's contribution (at current price) to GVA accounted for about 2.38% for the year 2018-19.

Table 1.1
Information in r/o Secretariat Proper Employees as on 31st March, 2019

Group	Sanctioned Strength	Total Number of present incumbents (Including general)	Number of SC/ST/OBC/Minority Women out of present incumbents					VH/HH/OH out of present incumbents		
			SC	ST	OBC	Minority	Women	VH	HH	OH
Group-A Gazetted	35	32	03	02	04	02	07	-	-	-
Group-B Gazetted	37	28	04	03	03	01	09	-	-	-
Group-B										
Non- Gazetted	55	47	12	07	09	01	09	01	-	01
Group-C	88	48	11	01	02	01	03	-	-	01
Total	215	155	30	13	18	05	28	01	-	02

1.10 Major Highlights / Achievements of Ministry of Mines.

- Shri Anil Mukim joined the Ministry of Mines as OSD on 15th March, 2018 and assumed charge of Secretary on 1st April, 2018 consequent to the superannuation of Shri Arun Kumar.
- The Ministry of Mines organized the 3rd National Conclave on Mines & Minerals on 20th March, 2018 at New Delhi.
- A meeting between His Excellency Aziz Rabbah, Minister of Energy, Mines and Sustainable Development of Kingdom of Morocco, and Hon'ble Union Minister of Mines was held on 11th April 2018 during which MoU between India and Morocco on cooperation in the field of mining & minerals sector was signed.
- Officers of the Ministry who were nominated as nodal officers of different Districts in country for the Gram Swaraj Abhiyan visited their respective districts for ensuring 100% saturation coverage of the seven flagship programmes of the Government of India. Further, all senior officers of the Ministry participated in the Civil Services Day function held on 20th-21st April, 2018.
- Hon'ble President of India conferred the National Geoscience Awards for the year 2017 at Vigyan Bhawan, New Delhi on 16th May, 2018.
- The Ministry of Mines organized the 4th National Conclave on Mines & Minerals on 13th July 2018 at Indore, Madhya Pradesh. Hon'ble Union Minister of Mines, Hon'ble Chief Minister of Madhya Pradesh, Hon'ble Union Minister of States for Mines, Hon'ble State Mining Ministers, officials of Central Ministries, officials of the State Government, CEO's of mining industries, industry associations, academic institutions and others participated in the conclave and held meaningful discussions on various issues & opportunities in the mining sector to bring about higher growth and facilitate 'Ease of Doing Business'.



National Workshop on DMF/PMKKKY held on 18th January, 2019 at New Delhi

- Two Assistant Secretaries of IAS 2016 Batch, Ms. Bandana Pokhriyal (West Bengal) and Shri Gopi B. (Telangana) joined the Ministry of Mines on 2nd July, 2018 for a period of 3 months.
- A meeting between Sudanese delegation led by H. E. Dr. Awad Ahmed Mohammed Elgaz, Assistant to the President of the Republic of the Sudan and Shri Narendra Singh Tomar, Hon'ble Union Minister of Mines was held on 8th August 2018.
- Secretary (Mines) along with senior officers of the Ministry & heads of CPSUs appeared before the Parliamentary Standing Committee on Coal and Steel on 3rd October, 2018 for examination of the implementation of District Mineral Foundation (DMF), Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) and Corporate Social Responsibility by the PSUs under the Ministry of Mines.
- Secretary (Mines) led an Indian delegation to attend Expo-Mina Peru-2018, the largest mining event in Peru from 12th to 14th September, 2018.
- A meeting was convened by Hon'ble Minister of Mines Shri Narendra Singh Tomar with senior officers of the Ministry and representatives of NALCO, MECL and HCL on 19th September, 2018 to review the Roadmap / Action Plan of CPSEs to be presented before the Hon'ble Prime Minister as follow up of the recommendations emerging from CPSE Conclave held on 9th April, 2018.
- Swachhata Pakhwada was organized by the Ministry from 16th October, 2018 to 31st October, 2018.
- An Indian delegation led by Shri Anil Kumar Nayak, Joint Secretary (Mines) participated in the "Annual International Mining and Resources Conference (IMARC-2018)" held at Melbourne, Australia during 29th October to 1st November, 2018.
- A National Level Workshop on District Mineral Foundation (DMF)/ Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) was organized by Ministry of Mines on 18th January, 2019.
- The meeting of the Consultative Committee of Ministry of Mines was held on 21st to 22nd January, 2019 under the chairmanship of Hon'ble Minister of Mines, Shri Narendra Singh Tomar at Statue of Unity, Kevadiya Colony, District Narmada, Gujarat to review the performance of National Aluminium Company Limited (NALCO).
- Meeting of Standing Committee on Coal and Steel was held on 2.1.2019 to review the "Development of Leased out Iron Ore Mines and optimum Capacity utilization" in which the challenges faced by iron ore industry were discussed.
- The Union Cabinet approved the National Mineral Policy 2019 (NMP 2019) on 28th February, 2019.
- Ministry of Mines coordinated the participation of the Government of India in Mining INDABA -2019 the largest mining event of the African continent, held at Cape Town, South Africa during 4th to 7th February, 2019.
- The 11th meeting of the Executive Committee (EC) of National Mineral Exploration Trust (NMET) was held on 7th February, 2019 and approved 9 mineral exploration projects

- amounting ₹ 1,844.42 Lakh.
- The 58th Meeting of the Central Geological Programming Board (CGPB) was held on 15th February, 2019 at New Delhi wherein the annual program of GSI for ensuing FS 2019-20 was finalized.
 - Secretary (Mines) led an Indian delegation to participate in 'Prospectors & Developers Association of Canada (PDAC-2019) held during 3rd to 6th, March, 2019 at Toronto, Canada.
 - During the year 2018, 3 Coordination-cum-Empowered Committee (CCEC) meetings were held on 8th March, 2018 at New Delhi, 12th July, 2018 at Indore and 12th October, 2018 at Ahmedabad.



Railway Siding in mining area, Odisha

A photograph showing a crane lifting a bundle of metal pipes. The crane's arm is on the right, and the bundle of pipes is suspended by a hook and cables. The background is a bright blue sky with scattered white clouds. The pipes are stacked and their circular ends are visible.

**Minerals and Metals
in the Country**

Minerals and Metals in the Country

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National Mineral Scenario

2.1 The country is endowed with huge resources of many metallic and non-metallic minerals. Mining sector is an important segment of the Indian economy. 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 (including building stones and other materials).



Safety Zone Plantation between lease boundaries of 3 iron ore mines in Odisha



Systematic mining benches in an Iron ore mine in District Sundargarh, Odisha

Mineral Production

2.3 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 ₹ 61,009 crore or 49.19% of the total value and non-metallic minerals including minor minerals is ₹ 63,011 crore or 50.81% of the total value. Information on production and value of minerals from 2014-15 to 2018-19 is given in **Annexure 2.1. (Page No. 186)** The details of export and import of minerals during the period 2013-14 to 2017-18 is given in **Annexure 2.2 (Page No. 187)** and **Annexure 2.3 (Page No. 188)** respectively.

Index of Mineral Production

2.2 Ministry of Statistics and Programme Implementation has shifted the base year of index of mineral production from 2004-05 to 2011-12. Based on the overall trend so far the index of mineral production (base 2011-12=100) for the year 2018-19 is estimated to be 108.1 as compared to 104.9 of previous year showing a positive growth of 3%. The trend of index of mineral production and trend of value of mineral production is depicted in **Figure 2.1** and **Figure 2.2** respectively. The value of minerals produced by groups for the last five years is given in **Figure 2.3**

Figure 2.1

**Index of Mineral Production
(Base 2011-12=100)**

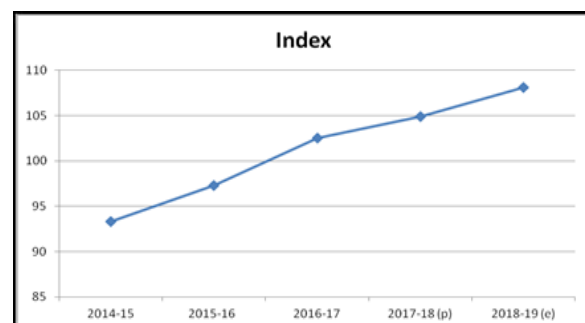


Figure 2.2
Trends in Value of Mineral Exports & Imports

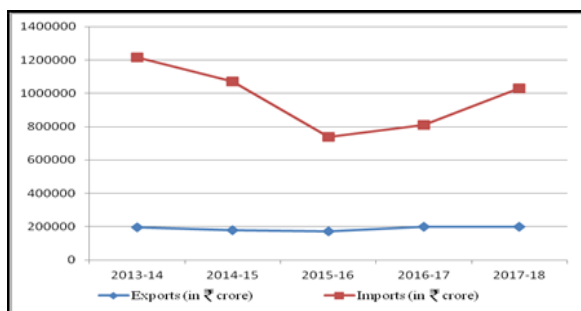
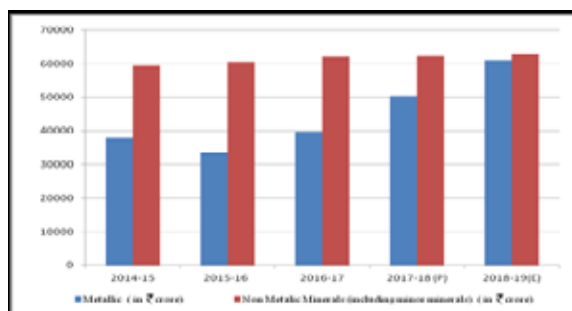


Figure 2.3
Value of Minerals Production (By groups)
(Excluding atomic & fuel minerals)



Price Trend

2.4 The Office of the Economic Advisor, Ministry of Commerce and Industry has shifted the base year from 2004-05 to 2011-12. The WPI for minerals (base 2011-12=100) stood at 139.3 in February 2019 and the corresponding index was 121.6 for February 2018.

2.5 The minerals included in the wholesale price index are bauxite, chromite, iron ore, copper conc., lead conc., garnet, zinc conc, manganese ore, limestone, phosphorite and sillamanite. The wholesale price index for metallic minerals was 126.2 in February 2019 as compared to 106.7 in February 2018 and that of other minerals was 185 in February 2019 as compared to 173.6 in February 2018.

Gross Value Added From Mining & Quarrying Sector

2.6 The provisional estimates of Gross Value Added (at 2011-12 prices) accrued from mining and quarrying sector for 2018-19 is at ₹ 370,564 crore. Similarly, the provisional estimates of GVA (at current prices) for 2018-19 is at ₹ 410,151 crore. The mining and quarrying sector's contribution (at current price) to GVA accounted for about 2.38% for the year 2018-19.

Mining

2.7 Indian mining industry is characterized by a large number of small operational mines. The number of mines which reported mineral production (excluding atomic, fuel and minor minerals) in India was 1405 in 2018-19 as against 1430 in the previous year. Out of 1405 reporting mines, most of the mines were reported in Madhya Pradesh followed by Gujarat, Karnataka, Odisha, Andhra Pradesh, Tamil Nadu, Chhattisgarh, Rajasthan, Goa, Maharashtra and Jharkhand.

The numbers of reporting mines are given in **Table 2.1**. Area-wise distribution of Mining Leases all over India pertaining to all minerals excluding fuel, atomic and minor minerals is given in **Table 2.2**.

Table 2.1
Number of Reporting Mines

Sector	2016-17	2017-18(P)	2018-19(E)
All Minerals*	1616	1430	1405
Metallic Minerals	685	638	625
Non-Metallic Minerals	931	792	780

*Excluding atomic, fuel and minor minerals.

Table 2.2
Area Wise Distribution of Mining Lease* As on 31/03/2017 (P) (All India)

Frequency Group (Area in Hect.)	Number of Mining Leases	Percentage of Total Leases	Area in Hects.	Percentage of Total Area
All Groups	4,382	100	3,66,010.88	100
0 to 10	2,035	57	15,565.44	4
10 to 20	508	12	7,485.70	2
20 to 50	648	15	21,318.33	6
50 to 100	533	12	40,182.43	11
100 to 200	252	6	35,538.42	9
200 to 500	224	5	72,181.90	20
Above 500	182	4	1,80,964.52	49

* Excluding fuel, atomic & minor minerals

2.8 The number of underground mines in operation mineral-wise (excluding fuel, atomic and minor minerals) is given in **Table 2.3**.

Table 2.3
Number of Underground Mines 2016-17 @ (By Principal Minerals)

Minerals	'A' Category	'B' Category	Total
Apatite	-	1	1
Chromite	6	-	6
Copper ore	5	-	5
Gold	4	1	5
Lead & Zinc	8	-	8
Manganese ore	9	7	16
Rock Salt	0	1	1
TOTAL	32	10	42

@ Excluding fuel, atomic & minor minerals

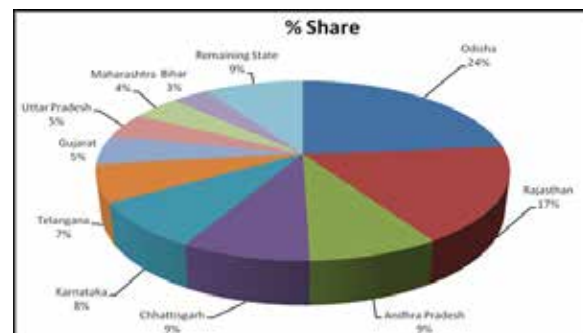
'A' Mechanized Mines: >150 labour in all or >75 labour in workings below ground.

'B' Other than 'A'

Mineral production

2.9 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 **Figure 2.4**.

Figure 2.4
Share of States in Value of Mineral Production 2018-19 (Estimated)
(Excluding Atomic & Fuel Minerals)



2.10 State-wise analysis revealed that during 2018-19, the value of mineral production (excluding fuel & atomic minerals) has shown a mixed trend as compared to that in the previous year. The states which have indicated major increase in the value of mineral production are Odisha (45.41%), Jharkhand (21.67%), Karnataka (9.23%), Madhya Pradesh

(8.96%), Assam (8.48%), Tamil Nadu (7.38%) etc. However, some of the principal mineral producing states recorded decrease in value of mineral production (excluding fuel & atomic minerals) and those include Goa (60.90%) and Jammu & Kashmir (2.66%).

2.11 The all India Reserves and Resources of various minerals as on 01.04.2005, as per UNFC System is given in **Annexure 2.4 (Page No. 189)**.

2.12 During 2017-18 (excluding atomic, fuel, and minor minerals), the private sector emerged to play a dominant role in mineral production accounting for 67.33% or ₹39,482 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 in 2017-18 were copper ore and concentrate, diamond, fluorite (graded), selenite, rock salt and Sulphur.

2.13 India's ranking in 2016 as compared to world production was 3rd in steel (crude), 4th in chromite, iron ore, aluminium (primary) & zinc (slab), 5th in bauxite and 6th in manganese ore and copper (refined). The statistics on indigenous and world production of principal minerals and metals are given in **Table 2.4**.

Table 2.4

Contribution and Rank of India in World Production of Principal Minerals & Metals, 2016

Commodity	Unit of quantity	Production		Contribution (Percentage)	India's rank in order of quantum of production
		World	India* (2016-17)		
Metallic Minerals					
Bauxite	'000 tonne	2,89,000	24,664	8.53	5th
Chromite	'000 tonne	34,800	3,727	10.71	4th
Iron ore	Million tonne	3,305	192	5.81	4th
Manganese ore	'000 tonne	51,200	2,393	4.67	6th
Industrial Minerals					
Magnesite	'000 tonne	29,800	299	1.00	10th
Apatite & rock phosphate	'000 tonne	2,76,000	1,181	0.43	17th
Metals					
Aluminium (Primary)	'000 tonne	58,800	2,896	4.92	4th
Copper (refined)	'000 tonne	23,400	787	3.36	6th
Steel (crude/liquid)	Million tonne	1,623	97.44	6.00	3rd
Lead (refined)	'000 tonne	11,300	142	1.25	14th
Zinc (slab)	'000 tonne	13,800	672	4.87	4th

Source: World mineral production data compiled from World Mineral Production, 2012-2016; 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.

* Figures relate to 2016-17.

Self-Reliance in Minerals & Mineral Based Products

2.14 India continued to be wholly or largely self-sufficient in minerals which constitute primary mineral raw materials that are supplied to industries, such as, thermal power generation, iron & steel, aluminium, cement, refractories, etc. India is, by and large, self sufficient in coal (with the exception of very low ash coking coal required by the steel plants), lignite, bauxite, chromite, iron, limestone, etc. India is deficient in kyanite, magnesite, sillimanite, rock phosphate, manganese ore, etc. which were imported to meet the demand. Despite high degree of self sufficiency, some

quantities of various minerals/ores are imported due to economic consideration or requirement of specific grade 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 in 2016-17 is furnished in **Table 2.5**.

Table 2.5
Degree of Self-sufficiency in Principal Minerals & Metals, 2016-17(P)

Sl. No.	Commodity	Apparent Demand* ('000 tonne)	Supply/Domestic supply ('000 tonne)	Order of self-sufficiency (%)
Minerals				
1	Bauxite	23769	24664	100
2	Chromite	3651	3727	100
3	Iron ore	193616	192081	99
4	Kyanite	3.85	3.25	84
5	Limestone	327166	313196 ^{1/}	96
6	Magnesite	433	299	69
7	Manganese ore	4300	2393	56
8	Rock phosphate (including apatite)	8686	1181	14
9	Sillimanite	78	68	87
Metals				
10	Aluminium	3100	2896	93
11	Copper (refined)	840 ^{2/}	787	94
12	Lead	272 ^{3/}	142	52
13	Zinc	686 ^{4/}	672	98

*: Apparent demand (production+ import-export).

Source: MCDR Returns & MSMP, March, 2017 for production data; DGCIS&S for export/import data.

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

(ii) 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/ Excludes production of limestone as a minor mineral, calcite & chalk and includes limeshell, limekankar and marl.

2/ Based on production of copper cathode and imports & exports of copper & alloys.

3/ Based on production of lead (primary), and imports & exports of lead & alloys.

4/ Based on production of zinc (ingots) and imports & exports of zinc & alloys.

Production Trends

Metallic Minerals

2.15 The value of metallic minerals in 2017-18 at ₹ 50,440 crore increased by 26.86% over the previous year. Among the principal metallic minerals, iron ore contributed ₹ 34,263 crore or 67.93%, zinc concentrate ₹ 4,980 or 9.87%, chromite ₹ 3,211 crore or 6.37%, silver ₹ 2,118 crore or 4.20%, while the remaining was contributed by manganese ore, bauxite, lead conc., copper (concentrate), gold and tin concentrates.

The Production of **bauxite** at 22,313 thousand tonne during 2017-18 registered a decrease of 10% as compared to the previous year. Odisha with 51% contribution was the leading producer of bauxite followed by Gujarat (14%), Jharkhand (12%), Chhattisgarh (11%) and Maharashtra (9%) and the remaining 3% of production was contributed by Madhya Pradesh and Goa. The share of public sector in the total production was 37% while remaining 63% was contributed by private sector. There were 152 reporting mines of Bauxite.

The production of **chromite** at 3481 th. tonne in 2017-18 decreased by 6.6% as



Stabilisation of Waste dump in an Iron Ore mine in District Keonjhar, Odisha



Effluent Treatment Plant in Chromite mine

compared to that in the previous year. Odisha reported almost entire production of chromite.

The production of **copper** ore in 2017-18 at 3679 th. tonne decreased by 4% as compared to that in the previous year. There were five reporting mines of copper ore in 2017-18. The production of copper concentrates at 142 th. tonne increased by 5% in 2017-18 as compared to that in the previous year.

The production of **gold** ore at 550 th. tonne in the year 2017-18 decreased by 6% as compared to that in the previous year. Almost entire production of gold ore and bullion was reported from Karnataka.

The production of **iron** ore consisting of lumps, fines and concentrates at 201 million tonne in 2017-18 increased by almost 3.0% as compared to 195 million tonne in the previous year. There were 294 reporting mines in 2017-18 as against 318 mines in the previous year. Odisha was the leading producer of iron ore accounting for 51% of total production followed by Chhattisgarh (17%), Karnataka (14%), Jharkhand (11%) and remaining (7%) production was reported from Andhra Pradesh, Goa, Madhya Pradesh, Maharashtra and Rajasthan.

The production of **lead & zinc** ores at 12.61 million tonne in 2017-18 increased by 6% as compared to that in the previous year. There were eight mines reporting production of lead and zinc ore in the current year. The production of lead concentrate increased by 14% and the production of zinc concentrate increased by 4% during the year. Rajasthan was the sole producing state of lead and zinc ores and concentrates.

The production of **manganese** ore at 2589 thousand tonne in 2017-18 has increased by 8% as compared to the previous year. There were 143 reporting mines of manganese ore in 2017-18. Madhya Pradesh continued to be the largest producer of Manganese Ore contributing 32% in the total output of the country.

Non-Metallic Minerals

2.16 The value of production of non-metallic minerals at ₹ 8,198 crore during 2017-18 increased by 2.10% as compared to the previous year. Limestone retained its leading position by contributing ₹7,441 crore or 90.77% of the total value of



Water Sprinkler arrangement on mine haul roads

non-metallic minerals in 2017-18. The other non-metallic minerals in the order of importance were phosphorite/rock phosphate (4.60%), and garnet (abrasive) (2.0%).

The production of **limestone** at 338.6 million tonne during 2017-18 increased by 7.6% as compared to that in the previous year.

The production of **magnesite** at 195 th. tonne during 2017-18 decreased by 35% as compared to that in the previous year. Tamil Nadu contributed 63% of the total production during 2017-18. The remaining was reported from Uttarakhand and Karnataka.

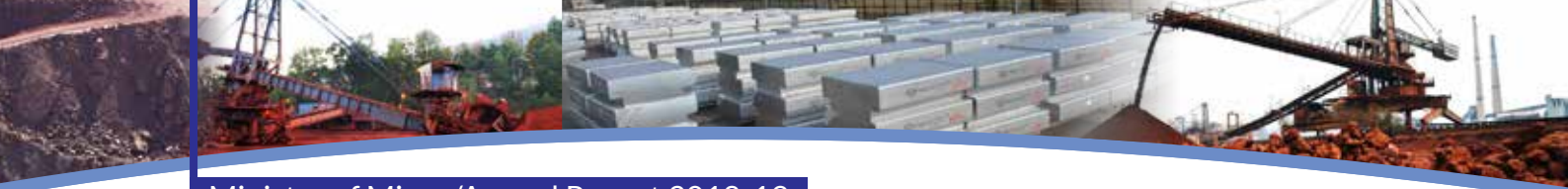
The production of **phosphorite** at 1534 thousand tonne in 2017-18 has increased by 36% as compared to that in the previous year. Rajasthan contributed 93% and the rest was accrued from Madhya Pradesh.

Minor Minerals

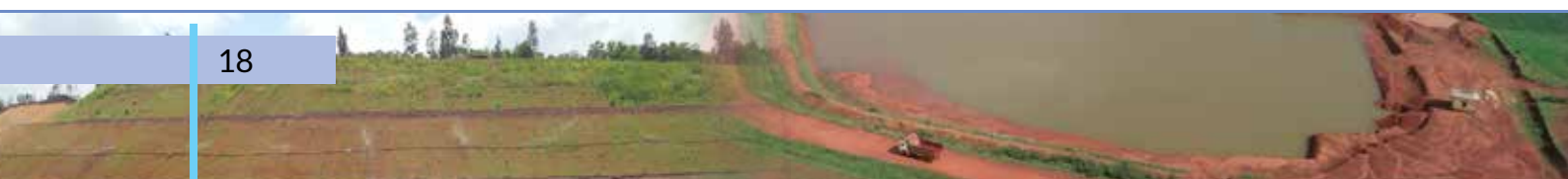
2.17 The value of production of minor minerals was estimated at ₹ 53994 crore in 2017-18. Rajasthan with a share of 18.28% in the value of minor minerals produced in the country occupied the top position. Andhra Pradesh was at second place with a share of 17.32% in the value of minor minerals. Next in the order was Telangana 14.34%, Gujarat 10.69%, Uttar Pradesh 10.40%, Bihar 7.91%, Maharashtra 7.73%, Kerala 4.12% and the contribution of remaining states and UTs was less than five percent each.

State-wise Mineral Scenario

2.18 Status of top mineral rich states of India is at **Annexure 2.5 (Page No. 194)**.



Aerial view of Chromite mine along with ETP





**Legislative Framework,
Mineral Policy and Implementation**

Legislative Framework, Mineral Policy and Implementation

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The Legislative Framework:

3.1 In the federal structure of India, the State Governments are the owners of minerals located within their respective boundaries. The Central Government is the owner of the minerals underlying the ocean within the territorial waters upto the Exclusive Economic Zone (EEZ) of India.

3.2 In this context, the entry at serial No. 23 of List II (State list) to the Constitution of India states,

‘Regulation of mines and mineral development subject to the provisions of List I with respect to regulation and development under the control of the Union.’

3.3 The entry at serial No. 54 of List I (Central list) to the Constitution of India states,

‘Regulation of mines and mineral development to the extent to which such regulation and development under the control of the Union is declared by Parliament by law to be expedient in the public interest.’

3.4 In pursuance to the entry at serial No. 54 of List I, the Central Government have framed Mines & Minerals (Development and Regulation) (MMDR) Act, 1957 as Central Act No. 67 of 1957.



Blasting at MCP

Acts under the administrative control of the Ministry of Mines:

3.5 The Mines and Minerals (Development and Regulation) (MMDR) Act, 1957: To provide for the development and regulation of mines and minerals resources and matter connected therewith.



Underground Mines at MCP

3.6 The Offshore Areas Mineral (Development and Regulation) Act, 2002: To provide for development and regulation of mineral resource in the “offshore areas” (which means the territorial waters, continental shelf, exclusive economic zone and other maritime zones of India under the Territorial Waters, Continental Shelf, Exclusive Economic Zone and Other Maritime Zones Act, 1976) and to provide for matters connected therewith or incidental thereto.

The Mines and Minerals (Development and Regulation) (MMDR) (Amendment) Act, 2015

3.7 MMDR Act, which governs the mineral sector, was overhauled by amendment in 2015, to bring in greater transparency, remove discretion and infuse greater ease of doing business.



Panoramic view of Systematic Mining at Redi Iron Ore Mine of M/s. Gogte Minerals in Sindhudurg district of Maharashtra State

3.8 Salient features of the amendment

- e-Auctions mandated for the grant of mineral concession to ensure transparent process of allotment of mineral blocks.
- Need of renewals and prior approvals removed for ease of doing business and removing discretions.
- Provided for establishment of District Mineral Foundation (DMF) for welfare of mining affected areas/people, through contribution from the mining lease holders established.
- Penal provisions made extremely stringent to deter illegal mining activities - Higher penalties up to ₹5 lacs per hectare of the area and jail term up to 5 years have been provided. Further, provision for constitution of special courts by the State Govt. for fast-track trial of cases of illegal mining.

3.9 All requisite subordinate Rules for implementation of amendment formulated and notified by 2017 -

- a) The Minerals (Evidence of Mineral Contents) Rules, 2015
- b) The Mineral (Auction) Rules, 2015
- c) The Mineral (Non-exclusive Reconnaissance Permits) Rules, 2015
- d) The National Mineral Exploration Trust Rules, 2015
- e) The Mineral (Mining by Government Company) Rules, 2015
- f) The Mines and Minerals (Contribution to District Mineral Foundation) Rules, 2015
- g) The Atomic Minerals Concession Rules, 2016
- h) The Mineral Concession (other than Atomic and Hydrocarbon Energy Minerals) Rules, 2016
- i) The Mineral Conservation & Development Rules, 2017
- j) For further refinement of the legislation to facilitate the Auction process, Mineral Auction Rules 2015 & Mineral Conservation &

Development Rules 2017 were amended in November, 2017 & March 2018 respectively.

- k) Atomic Minerals Concession Rules, 2016 has been amended in February, 2019.

3.10 Further, the Granite Conservation and Development Rules, 1999 and Marble Development and Conservation Rules, 2002 have also been framed under Section of 18 of the MMDR Act, 1957 for conservation and systematic development of granite and marble resources in the country, respectively.

National Mineral Policy; 2019:

3.11 National Mineral Policy 2019 has been approved by the Union Cabinet, chaired by the Hon'ble Prime Minister on 28 Feb 2019.

3.12 National Mineral Policy 2019 replaces the extant National Mineral Policy 2008 ("NMP 2008") which was announced in year 2008. The impetus to review NMP 2008 is by way of a direction from the Supreme Court vide its judgment dated 02.08.2017 in Writ Petition (Civil) No. 114/2014 titled Common Cause v/s Union of India & Others.



MCP open cast Mine view

3.13 Objective: The aim of National Mineral Policy 2019 is to have a more

effective, meaningful and implementable policy that brings in further transparency, better regulation and enforcement, balanced social and economic growth as well as sustainable mining practices.

3.14 Details: The National Mineral Policy 2019 includes provisions to boost mining sector viz.

- introduction of Right of First Refusal for RP/PL holders,
- encouraging the private sector to take up exploration,
- auctioning in virgin areas for composite RP-cum-PL-cum ML on revenue share basis,
- encouragement of merger and acquisition of mining entities and
- transfer of mining leases and creation of dedicated mineral corridors to boost private sector mining areas.
- The 2019 Policy proposes to grant industry status to mining activity to boost financing of mining by private sector and for acquisitions of mineral assets in other countries by private sector
- It also mentions that long term import export policy for minerals will help private sector in better planning and stability in business



MCP open cast Mine view



A rare occurrence of Chromitite showing pitted appearance occurring as a band within ultramafic schist in Sindhudurg District.

- The Policy also envisages to harmonize taxes, levies & royalty with world benchmarks to help private sector

3.15 The National Mineral Policy, 2019 focus on Make in India initiative and gender sensitivity in terms of the vision. In so far as the regulation in Minerals is concerned, E-Governance, IT enabled systems, awareness and Information campaigns have been incorporated. Regarding the role of state in mineral development online public portal with provision for generating triggers at higher level in the event of delay of clearances has been put in place. NMP 2019 aims to attract private investment through incentives while efforts would be made to maintain a database of mineral resources and tenements under mining tenement systems. The new policy focuses to use coastal waterways and inland shipping for evacuation and transportation of minerals and encourages dedicated mineral corridors to facilitate the transportation of minerals. The utilization of the district mineral fund for equitable development of project affected persons and areas is ensured. NMP 2019 proposes a long term export import policy for the mineral sector to provide stability and as an incentive for investing in large scale commercial mining activity.

3.16 The 2019 Policy also introduces the concept of Inter-Generational Equity that deals with the well-being not only of the present generation but also of the generations to come and also proposes to constitute an inter-ministerial body to institutionalize the mechanism for ensuring sustainable development in mining.

3.17 Benefits: The New National Mineral Policy will ensure more effective regulation. It will lead to sustainable mining sector development in future while addressing the issues of project affected persons especially those residing in tribal areas

3.18 Measures taken to control illegal mining:

- i) State Governments were asked to frame rules to control illegal mining as per Section 23 (c) of MMDR Act, 1957 (so far 20 States have framed Rules).
- ii) State Governments were requested to set up Task Forces at State and District levels to control illegal mining since the year 2005 (so far 22 States have reported to have set up Task Forces).
- iii) State Governments were advised to set up State Coordination-cum-Empowered Committee (SCEC) to coordinate efforts to control illegal mining by including representatives



Aluminium Ingots ready for despatch

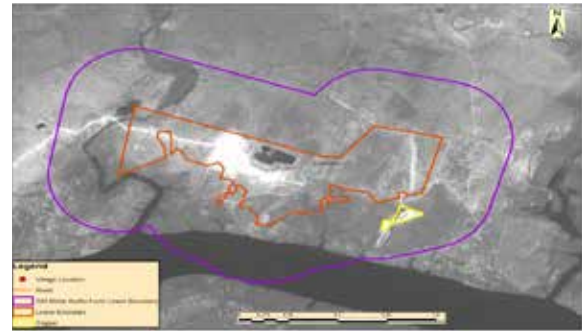
of Railways, Customs and Port authorities (13 State Governments have set up such committees).

- iv) All State Governments have been advised to adopt an Action Plan with specific measures to detect and control illegal mining including use of remote sensing, control on traffic, gather market intelligence, registration of end-users and setting up of special cells, etc.
- v) Railways have instituted a mechanism to allow transportation of iron ore only against permits issued rake-wise and verified by State Governments, apart from taking measures to fence and set up check posts at the railway sidings.
- vi) Customs Department has issued instructions to all its field units to share information on ore export with State Governments.
- vii) Ministry of Shipping has issued a direction to all major Ports to streamline the verification procedures for movement of consignment by road and rail to ports for export.

3.19 Separately, the Central Government through Indian Bureau of Mines (IBM) has constituted a Special Task Force for inspection of mines in endemic areas.

3.20 The Mineral Conservation and Development Rules, 2017 (MCDR) provides for measures to ensure scientific management of the mining process. Rule 45 of the MCDR provides for the mining companies to provide periodic reports on the extraction and disposal of the mined material. Rule 45 of MCDR also facilitates 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. The amended Rule 45 now makes it mandatory for all miners, traders, stockist, exporters and end-users of minerals to register and report on the production, trade and utilization of minerals to the



Representative System of triggers generated on satellite images in the vicinity of existing mining areas.

State Government(s) and Indian Bureau of Mines. Up to March 2019, total 3804 mining leases excluding 31 minor minerals have been registered online with IBM. IBM has suspended 108 mines for noncompliance and recommended 218 cases to State Governments for termination. Similarly, as regards to the status of registration of end users, traders, stockiest and exporters, at the end of March, 2019 total 3515 units of end-users, 5901 number of traders, 1762 number of stockist and 933 number of exporters have been registered. Indian Bureau of Mines has also requested the State Governments not to issue transit passes for movement of minerals to unregistered operators.

3.21 In order to bring a check on illegal mining, the MMDR Amendment Act, has made the penal provisions for illegal mining more stringent. Higher penalties and jail terms have been provided. A provision has also been made for constitution of Special Courts by State Governments for speedy trial of cases related to illegal mining.

Space Technology for checking illegal Mining

3.22 Indian Bureau of Mines (IBM), has entered into a MoU with National Remote Sensing Centre (NRSC), for a pilot project “Sudoor Drushti” to demonstrate the feasibility of using High Resolution Satellite Imagery and Digital Elevation Model (DEM) in monitoring mining activities / changes over selected group of mines.

- Regarding setting up of Remote Sensing Laboratories, NRSC has guided IBM in finalizing the technical specification of software, hardware and procurement procedures. IBM has procured all the necessary softwares and hardwares for the lab. The remote sensing labs have been established at Nagpur and other at Hyderabad and are fully operational.
- As a part of pilot project in Tandur area Andhra Pradesh, volume changes in a cluster of mines (6) studied for 2007-2015 period and observed that overall volume change is +10 to 11% only.
- Facilitate to monitor periodic changes of the mining areas within the mining lease boundary for a time period.

3.23 Mining Surveillance System (MSS)

- MSS Project, using Satellite Remote Sensing Technology together with Information Technology, has been developed and rolled out for major minerals in October 2016 for major minerals, to curb cases of illegal mining.

Mineral Concession System

3.24 The State Governments used to grant the mineral concessions [Reconnaissance Permit (RP), Prospecting License (PL) and

Mining Lease (ML)] under the provisions of the pre-amended Mines and Minerals (Development and Regulation) (MMDR) Act, 1957. Prior approval of the Central Government was required under Section 5 (1) of the Act for grant of RP, PL and ML in respect of Atomic and Metallic & Non- Metallic Minerals specified in Parts ‘B’ and ‘C’ of the First Schedule to the Act. Subsequent to the prior approval of the Central Government, mining leases are executed by the State Governments in favors of the applicant mining agencies after they obtain all statutory clearances and approvals as specified in the principal/ Lol as the case may be. The metallic minerals which figure in Part ‘C’ of the First Schedule to the Act in which prior approval were required are Asbestos, Bauxite, Chrome Ore, Copper ore, Gold, Iron ore, Lead, Manganese ore, Zinc and precious stones. The Central Government amended the existing MMDR Act and brought the amended Act into force w.e.f 12.1.2015. The State Government will continue to grant mineral concession but all these grants would be through auctions, thereby bringing in greater transparency and removing discretion. The tenure of the mineral concession has been increased from the existing 30 years to 50 years. Thereafter, the mining lease would be put up for auction (and not for renewal as followed in the earlier system).

3.25 Mineral Auctions

Auction Framework and Handholding Support

- The Government of India amended the Mines & Minerals (Development & Regulation) (MMDR) Act, the principal act which governs the mineral sector in India, with effect from 12th January,

2015, which brought major paradigm shifts in the mining regulations, including the grant of mineral concessions of major minerals through auctions to bring transparency and remove discretion.

- The necessary rules enabling the auction of mineral blocks under the MMDR Amendment Act, 2015, viz. Mineral (Evidence of Mineral Content) Rules & Mineral (Auction) Rules were notified soon after by the Ministry. The Ministry also formulated the 'Model' tender documents to facilitate the State Governments to expedite the auction process.
- In order to provide handholding support for the implementation of auctions of mining leases/PL-cum-MLs, the Ministry of Mines through its Institutions i.e. Geological Survey of India (GSI), Mineral Exploration Corporation Ltd. (MECL) and Indian Bureau of Mines (IBM) and Central Public Sector Enterprises such as SBI Capital Markets Ltd. (SBICAP), MECON Ltd. and MSTC Ltd. provided initial handholding support to the State Governments for Transaction Advisory Services, Differential Global

Positioning System (DGPS) Survey, Geological Report (GR) preparation and e-auction platform.

3.26 Auction Status

- 54 mineral blocks across 9 States, namely Rajasthan, Odisha, Madhya Pradesh, Chhattisgarh, Karnataka, Jharkhand, Andhra Pradesh, Gujarat and Maharashtra have been successfully auctioned till 2018-19.
- The estimated value of resources in the 54 successfully e-auctioned mineral blocks across the country is over ₹ 2,25,998 crore. The total estimated revenue to the State Governments over the lease period of these mines stands at ₹1,83,405 crore. The estimated additional contribution to the State Governments by way of auction premium is ₹ 1,43,389 crore over the lease period. Out of the cumulative statutory payments of ₹ 40,016 crore, the Royalty, the District Mineral Fund (DMF) and National Mineral Exploration Trust (NMET) contributions work out to be ₹ 35,729 crore, ₹ 3,573 crore and ₹ 715 crore respectively. Year-wise Auction Summary is given at **Table 3.1**.



GCP_Plant view

Table 3.1
Year-wise Auction Summary as on 31.03.2019

Year	2015-16	2016-17	2017-18	2018-19	Total
Number of blocks auctioned	6	15	14	19	54
Minerals	4 Limestone, 1 Iron Ore, 1 Gold	7 Iron Ore, 5 Limestone, 1 Manganese, 1 Diamond, 1 Gold	10 Limestone, 2 Iron Ore, 1 Gold, 1 Bauxite	9 Iron Ore, 5 Limestone, 3 Graphite, 1 Manganese, 1 Gold	54 Blocks (24 Limestone, 19 Iron Ore, 4 Gold, 2 Manganese, 3 Graphite, 1 Bauxite, 1 Diamond)
Estimated value of the resources (in cr)	29,817.72	63,372.56	90,136.20	42,672	2,25,998
Additional Contribution through Auction (in crore)	13,032.23	44,501.74	53,850.14	32,005	1,43,389
Royalty (in crore)	4,565.44	9,564.42	14,895.90	6,703.21	35,729
DMF (in crore)	456.54	956.44	1,489.59	670.32	3,5730
NMET (in crore)	91.31	191.29	297.92	134.06	715
Total of Royalty + DMF + NMET (Statutory Payments) (in crore)	5,113.30	10,712.15	16,683.41	7507.6	40,016
Total revenue to the Govt. over 50 years (in crore)	18,145.53	55,213.88	70,533.55	39,512.11	1,83,405

3.27 List of Mineral Blocks to be auctioned in 2019-20:

- 139 mineral blocks have been planned to be put on auction by the State Governments in 2019-20 (as per the information given by the State Governments), along with 46 working mine leases expiring in 2020.

State	Blocks in pipeline for 2019-20 *(excluding mines expiring in 2020)
Andhra Pradesh	17 Blocks (9 Limestone, 4 Manganese, 1 Iron Ore, 1 Copper, 1 Gold, 1 Lead)
Chhattisgarh	11 Blocks (7 Bauxite, 4 Limestone)
Gujarat	11 Limestone & Bauxite Blocks
Jharkhand	26 Blocks (11 Bauxite, 5 Graphite, 3 Manganese, 2 Limestone, 2 Emerald, 1 Copper, 1 Dolomite, 1 Limestone & Dolomite)
Karnataka	14 Blocks (8 Iron Ore, 6 Limestone)
Maharashtra	13 Blocks (6 bauxite, 2 copper, 1 Manganese, 1 Iron ore, 3 Limestone)
Odisha	39 Blocks (15 Iron Ore, 10 Manganese, 5 Bauxite, 4 Graphite, 3 Limestone, 1 Iron & Manganese, 1 Limestone & Dolomite)
Rajasthan	8 Blocks (7 Limestone, 1 Copper & Gold)
Total	139 Blocks

3.28 District Mineral Foundation (DMF) and Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY)

- DMF is meant to address the long standing demand of the local people in mining areas for inclusive growth. The funds for DMF will be met from additional contributions of 30 % of royalty by existing miners and 10% by miners granted mines after the MMDR Amendment w.e.f. 12.1.2015. The Annual budget of DMFs for major mineral States would be about 6,000 crore.
- The Government has formulated Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) to be implemented by the DMFs of the respective districts. It has been issued as a directive under Section 20A of the Act by the Central Government on 16.09.2015.
- The PMKKKY has mandated 60% of the funds to be utilized for High Priority Areas, such as Drinking water / Environment preservation and pollution control / Health care / Education / Skill development / Welfare of women, children, aged and disabled people / Sanitation and
- 40% of the funds to be utilized for Infrastructure - Roads & physical infrastructure / Irrigation / Watershed development. The projects implemented under PMKKKY will help create a congenial mining environment, ameliorate the condition of the affected persons and create a win-win situation for the stakeholders.

- ₹ 27,529.99 crore have been collected as on 31.03.2019.
- More than 1,35,000 projects have been sanctioned under PMKKKY.
- Funds worth more than ₹ 23,800 crore have been sanctioned for various projects.
- A national level portal <http://mitra.ibm.gov.in/pmkkky> has been launched where upto date information regarding fund collection and utilization is being displayed.
 - o District wise breakup of funds is displayed
 - o Data for fund collection and utilization is fed directly from the districts on the national level portal.
 - o Project details w.r.t the High Priority and Other priority sectors as specified in the PMKKKY guidelines are entered by the District Mineral Foundations.
 - o The dashboard displaying fund and project information is available to the public for view.

National Mineral Exploration Policy (NMEP)- 2016

3.29 India has a huge potential for mineral resources. However, till date the Government did not have a mineral exploration policy and initiatives taken so far by the Government could achieve only a limited success.

3.30 Investment flow for mineral exploration was insignificant, which was primarily being carried out by Government agencies viz. Geological Survey of India and Mineral Exploration Corporation

Limited with their limited resources. As per international best practices and successful models, government agencies generate and disseminate baseline geoscience data and private agencies carry out regional & detailed exploration.

3.31 Further, the MMDR Amendment Act-2015 had brought in significant changes in the legal framework related to mineral exploration, the most important feature being the grant of mining leases (ML) and prospecting license cum-mining lease (PL-cum-ML) only through auction process. This created the necessity of boosting exploration operations in the country so as to create a pool of auctionable blocks.

3.32 The Government comprehensively reviewed its exploration strategy and formulated the National Mineral Exploration Policy-2016, which was notified on 13th July, 2016.

3.33 NMEP aims towards accelerating mineral exploration in the country. The salient features of the NMEP are as follows:

- Attractive provisions for inviting private investment in mineral exploration through revenue sharing model. GSI has already identified 100 exploration blocks for mineral exploration for implementing such schemes. The block have been awarded to different notified mineral exploration agencies for implementation.
- GSI will make available pre-competitive baseline Geoscience data of international standard in a time bound manner. This data will be acquired as a public good for open dissemination free of charge. In this

regard GSI has placed all available baseline geoscience data in a geospatial platform “Bhukosh” for open access of the stakeholders as per extant rules of Data Sharing and Accessibility Policy 2019 since March 2019.

- GSI will undertake a National Aero geophysical Mapping project (NAGMP) for magnetic and spectrometric survey. Initially this will be done on the most potential areas of about 8 lakh sq km. of the country. GSI has launched the NAGMP in April, 2017 for acquiring the magnetic and spectro-magnetic survey data and data acquisition over an area of 1.80 lakh sq km have been achieved till March 2019.
- A National Geoscience Data Repository (NGDR) will be set up by GSI which will collate all geoscientific baseline data and mineral exploration information generated by diverse exploration agencies on a geospatial format. The establishment of NGDR is in progress and the Mineral Exploration Reporting Templates is being finalised for data sharing.
- Government proposes to establish a nonprofit autonomous institution, called National Centre of Mineral Targeting (NCMT) which will be a collaborative effort of government, industry and academic institutions.
- Govt. launched “Operation Khanij Khoj” to probe deep seated/concealed mineral deposits in the country.
- Upgradation of chemical and ore beneficiation laboratories of the Central Agencies and State Governments.

Revision Applications

3.34 Under Section 30 of the Mines and Minerals (Development and Regulation) Act, 1957 and Rule 35 of the Minerals (other than Atomic & Hydro Carbons Energy Minerals) Concession Rules, 2016 the Ministry of Mines exercises its Revisionary Powers in dealing with the Revision Applications filed by the applicants who are aggrieved by any order passed by the State Govt. or any other authority under Rule 35 and 36 of MCR 2016 detailed procedure for filing and disposal of Revision Application has been prescribed.

3.35 Disposal of Revision Applications has public interface. In order to ensure transparency in disposal of Revision cases, software i.e. ras. nic.in has been implemented for effective monitoring of the Revision Applications, received in the Ministry of Mines. This system keeps track of the various stages of the Revision Applications filed by the applicants till the final disposal of the applications. The system is web enabled and has link on the website of the Ministry of Mines. The salient features of the system are as under:-

- (i) Status of Revision Application is available on website.
- (ii) Final Orders are available on the website;
- (iii) Final Order numbers are generated by the system automatically;
- (iv) Hearing details etc. are available on the website;
- (v) Revision Application numbers are generated by the system automatically;

3.36 As far as possible, cases are being



Copper Cathodes

heard on a chronological order and their age of pendency.

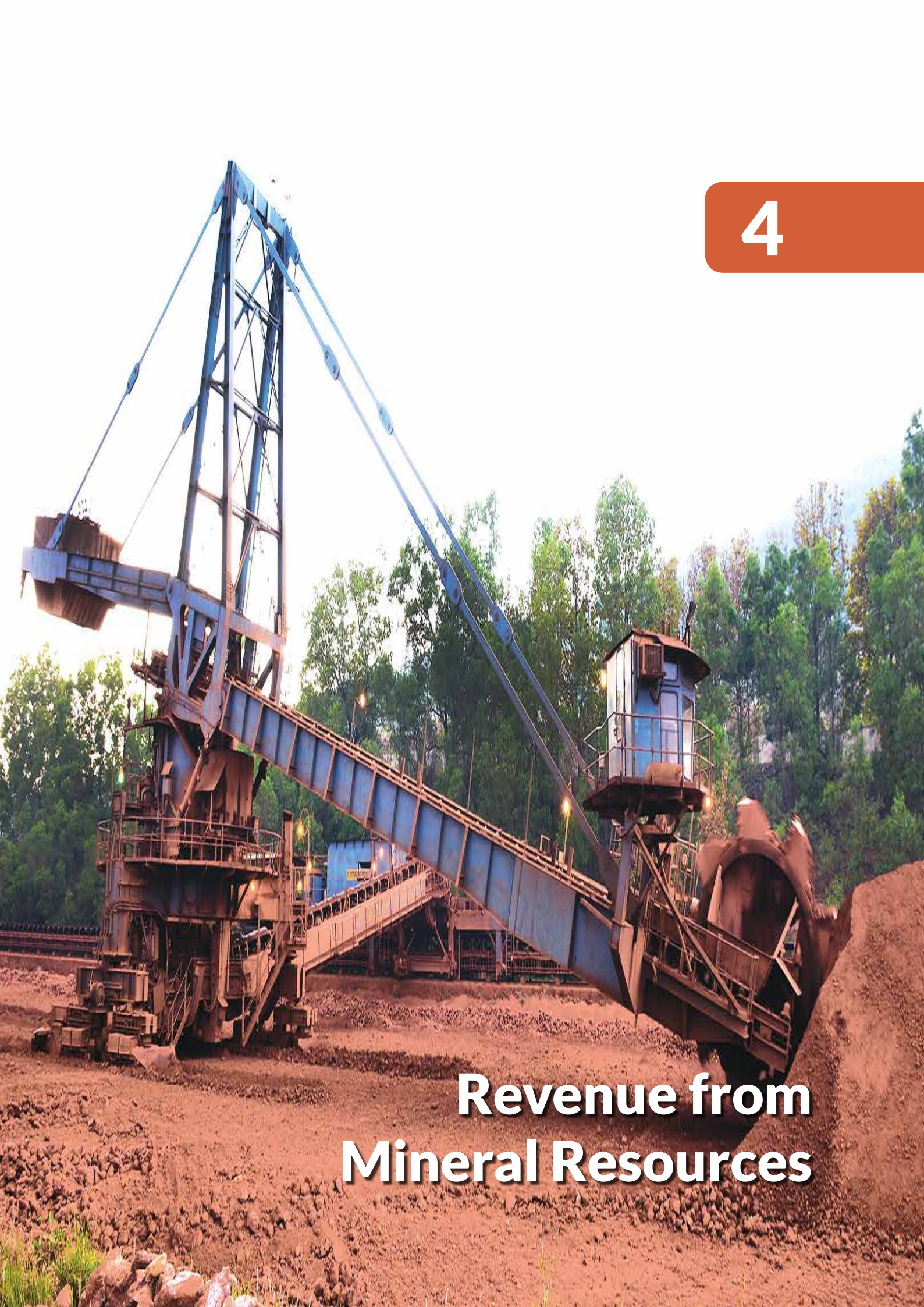
3.37 The website is accessible by public and the copy of Final Order & Hearing Notices can be downloaded from the Website.

3.38 During 1st January, 2018 to 31st March, 2019, 355 Revision Applications were disposed of by the Revisionary Authority in the Ministry of Mines.



GCP_Plant view





Revenue from Mineral Resources

Revenue from Mineral Resources

- Royalty - Legal provisions Page - 35
- Revision of rates of royalty and dead rent in respect of major minerals Page - 35
- Rates of royalty Page - 37

Royalty

Legal Provisions

4.1 Under the provisions of Section 9(3) of the MMDR Act, 1957, the Central Government may, by notification in the Official Gazette, amend the Second Schedule, so as to enhance or reduce the rate at which royalty shall be payable in respect of any minerals with effect from such date as may be specified in the Notification, provided that the Central Government shall not enhance the rate of royalty in respect of any minerals more than once during any period of three years. Similarly under Section 9A(2) of the Act, the Central Government may, by notification in the official Gazette, amend the Third Schedule so as to enhance or reduce the rate at which the dead rent shall be payable in respect of any area covered by mining lease and such enhancement or reduction shall take effect from such date as may be specified in the notification, provided that the Central Government shall not enhance the rate of the dead rent in respect of any such area more than once during any period of three years.

Revision of rates of royalty and dead rent in respect of major minerals (non-coal minerals)

4.2 In exercise of the powers conferred

under Section 9(3) of the MMDR Act, 1957, the Central Government has amended the Second Schedule (Rates of Royalty in respect of Second Schedule minerals) to the said Act, and notified/published vide notification No.G.S.R.630(E) dated 01.9.2014. Further, in exercise of the power conferred under Section 9A(2) of the above said Act, the Central Government has amended the Third Schedule (Rates of Dead Rent) of the said Act and published/notified vide notification No. G.S.R.631(E) dated 01.9.2014. Royalty accrual for 4 years for major minerals (other than coal, lignite and sand for stowing) from the various State Governments for the year 2013-14, 2014-15, 2015-16 and 2016-17 are in given at **Table 4.1**.

4.3 Existing royalty rates for some important industrial use minerals is given at **Table 4.2**.

4.4 A study group on revision of rates of royalty and dead rent for minerals (other than coal, lignite, sand for stowing and minor minerals) was constituted vide Ministry of Mines order no. 9/1/2018 –M.V dated 9th February, 2018. So far 3 study group meetings and sub group meetings at Nagpur and Hyderabad have been organized for interaction with all stake holders. Draft chapters of sub group reports are under preparation.



National Workshop on DMF/PMKKKY held on 18th January, 2019 at New Delhi

Table: 4.1
State wise Royalty accrual of Major Minerals
(Other than Coal, Lignite, Sand for Stowing and Minor Minerals) from 2014-15 to 2017-18
(Value ₹ in Lakh)

State	2014-15#	2015-16	2016-17	2017-18
Andhra Pradesh	29,082	21,331	33,647	54,507
Assam	139	298	528	464
Bihar	379	367	152	34
Chhattisgarh	1,53,352	1,07,376	1,11,533	1,64,459
Goa	230	4,288	31,475	23,961
Gujarat	31,931	35,559	27,044	25,519
Himachal Pradesh	9,274	7,523	7,082	13,175
J & K	1,123	1,335	946	1,540
Jharkhand	84,394	1,17,171	69,037	1,25,559
Karnataka	82,657	81,182	1,03,433	1,27,086
Kerala	655	785	645	851
Maharashtra	16,305	16,241	14,562	17,136
Meghalaya	2,036	2,998	4,470	5,592
Madhya Pradesh	37,320	39,266	37,792	45,881
Odisha	2,93,547	3,41,373	2,49,634	3,39,344
Rajasthan	1,81,412	1,87,323	2,36,612	2,62,656
Tamil Nadu	17,698	18,777	20,210	15,067
Telangana	17,661	19,015	20,126	22,953
Uttar Pradesh*	NA	NA	628	1,919
Uttarkhand	30	24	32	23
TOTAL	9,59,224	10,02,231	9,69,586	12,47,736

Source: Information received from respective State Governments.

* Based on information received from Regional Office, Jabalpur in respect of Sonbhadra District.

Does not include information in respect of 31 minerals declared as minor minerals vide Gazette Notification No. GSR423 (E) dated 10th February, 2015.

N.A.: Not Available

Table 4.2
Rates of Royalty

(Published vide notification GSR 630 (E) dated 01.09.2014 in Extra Ordinary Gazette of India)

1.	Bauxite and Laterite:	<p>(a) Metallurgical Grade: Zero point six zero per cent of London Metal Exchange Aluminium metal price chargeable on the contained aluminium metal in ore produced for those dispatched for use in alumina and aluminium metal extraction.</p> <p>(b) Non-Metallurgical Grade: Twenty five per cent of sale price on ad valorem basis for those dispatched for use other than alumina and aluminium metal extraction and for export.</p>
2.	Chromite:	Fifteen per cent of average sale price on ad valorem basis.
3.	Copper:	Four point six two per cent of London Metal Exchange Copper metal price chargeable on the contained copper metal in ore produced.
4.	Diamond:	Eleven point five per cent of average sale price on ad valorem basis.
5.	Gold: (i) Primary (ii) By-product gold	<p>Four per cent of London Bullion Market Association Price (commonly referred to as "London Price") chargeable on the contained gold metal in ore produced.</p> <p>Three point three per cent of London Bullion Market Association Price (commonly referred to as "London Price") chargeable on the by-product gold metal actually produced.</p>
6.	6. Iron ore : (lumps, fines & concentrates all grades)	Fifteen per cent of average sale price on ad valorem basis.
7.	7. Manganese Ore : (a) Ore of all grades (b) Concentrates	<p>Five per cent of average sale price on ad valorem basis.</p> <p>One point seven per cent of average sale price on ad valorem basis.</p>
8.	Nickel:	Zero point one two per cent of London Metal Exchange nickel metal price chargeable on contained nickel metal in ore produced.
9.	Silver: (i) By-product (ii) Primary Silver	<p>Seven per cent of London Metal Exchange Price chargeable on by-product silver metal actually produced.</p> <p>Five per cent of London Metal Exchange silver metal price chargeable on the contained silver metal in ore produced.</p>
10.	Zinc:	<p>(a) Nine point five per cent of London Metal Exchange zinc metal price on ad valorem basis chargeable on contained zinc metal in ore produced.</p> <p>(b) Ten per cent of London Metal Exchange zinc metal price on ad valorem basis chargeable on contained zinc metal in concentrate produced.</p>



Run-of-Mine Mucking at Nuasahi underground Mines





International Cooperation

International Cooperation

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- Memorandum of Understanding signed during the period Page - 41
- Meeting of the India-Russia Sub-Group on Mining Page - 41
- Joint Working Group Meeting between India and Peru: Page - 42
- Prospectors & Developers Associations of Canada (PDAC-2018 & 2019) Page - 43
- 25th World Mining Congress-2018 Page - 44
- The International Mining and Resources Conference-2018 (IMARC-2018) Page- 45

Objectives:

5.1 Development of Mining Sector is essential for a country's development in industrial sector. India is deficient in many important minerals and India also needs capacity building in geosciences, transfer of technology in mining sector as well as acquisition of mining assets abroad by public and private sector. To ensure the seamless supply of the minerals, Ministry of Mines is engaged to strengthen its cooperation in the area of geology and mineral resources with mineral rich countries. In order to achieve these objectives, International Co-operation Division has been engaged in collaboration with countries like Canada, Australia, Russia and African countries. India has been participating in various International Mining events by setting up India Pavillion, making presentations before the delegates about the recent reforms and opportunities in mining sector in India so as to attract foreign investment in Indian mining sector.

Memorandum of Understanding signed during the period

MoU with Morocco:

5.2 An MoU between Ministry of Mines Govt. of India and Ministry of Energy Mines and Sustainable Development of the Government of the Kingdom of Morocco was signed at New Delhi on 11th April, 2018 on cooperation in field of Mining & Geology for an initial period of five years during the visit of Hon'ble president of Morocco. Shri Narendra Singh Tomar, Hon'ble Union Minister of Mines signed the MoU on behalf of the Government of India to strengthen the cooperation between the two countries in the fields on geology and mining.

MoU with Zimbabwe:

5.3 An MoU between the Republic of India and the Republic of Zimbabwe was signed at Harare, Zimbabwe on 3rd November, 2018 on cooperation in field of Geology, Mining and Mineral Resources in presence of the Hon'ble Vice President of India during his visit to Zimbabwe. This MoU would envisage the facilitation and greater cooperation between the two countries in the area of mining sector.

Bilateral Meetings

Meeting of the India-Russia Sub-Group on Mining:

5.4 The 7th meeting of the India-Russia Sub-Group on mining-of the Working Group on Modernization and Industrial Cooperation under the India-Russia Inter Governmental Commission on Trade, Economic, Scientific, Technological and Cultural Cooperation was held in New Delhi on 28th August, 2018. Shri Anil Kumar Nayak, Joint Secretary, Ministry of Mines co-chaired the meeting from Indian side and Mr. Kornaukhov Egor Yurievich, Head, Division for Investment Activity



Signing of Protocol by Shri Anil Kumar Nayak, Joint Secretary, Ministry of Mines on behalf of India and Mr. Kornaukhov Egor Yurievich, Head, Division for Investment Activity and Economic Analysis of the Ministry of Industry and Trade of the Russian Federation.

and Economic Analysis of the Ministry of Industry and Trade of the Russian Federation co-chaired the meeting from Russian side. At the end of the meeting, a Protocol was signed identifying the cooperation programme between the two countries in mining and metallurgy sector.

Joint Working Group Meeting between India and Peru:

5.5 2nd meeting of Joint Working Group between India and Peru under the existing MoU was held on 13th September, 2018 in Lima, Peru. Secretary, (Mines) co-chaired the meeting on behalf of Govt. of India and Mr. Luis Miguel Inchauestegui Zevallos, Vice Minister of Mines, Ministry of Energy and Mines of the Republic of Peru co-chaired on behalf of Peruvian side. During the meeting, it was agreed that private sectors in mining of both countries should enhance interactions to take the cooperation in mining sector to the next level and Geological Survey of India and its counterpart in Peru (INGIMMET) should go for exchange of expertise and signing a MoU between them for further collaboration.



Secretary (Mines) co-chaired the 2nd meeting of JWG between India and Peru

Meeting of Joint Committee between India and Morocco:

5.6 First Joint Committee Meeting under the existing MoU on cooperation in the fields of mining and geology between India

and Morocco was held on 22nd February, 2019 at Dr Ambedkar International Centre, New Delhi. Shri Anil Kumar Nayak, Joint Secretary, Ministry of Mines co-chaired the meeting from India side. Mr. Abdelaali Lefdaoui, Head of Division of Mining Development in the Directorate of Mines and Hydrocarbons of the Ministry of Energy, Mines and Sustainable Development of the Government of the Kingdom of Morocco co-chaired the meeting from Moroccan side. On conclusion of the meeting, a Protocol / Minutes was signed identifying the specific area of cooperation in order to implement the objectives of the MoU.



Signing of MoU by Shri Anil Kumar Nayak, Joint Secretary, Ministry of Mines on behalf of India and Mr. Abdelaali Lefdaoui, Head of Division of Mining Development in the Directorate of Mines of the Government of the Kingdom of Morocco.

Participation in international mining events.

Mining Indaba-2018:

5.7 "Mining Indaba" is one of the world's largest mining conferences and largest mining event in the African continent and held annually at Cape Town, South Africa. It is often referred to as 'investing in African Mining projects / related activities'. Mining Indaba-2018 was held during 5th to 8th February, 2018. Shri Arun Kumar, the then Secretary, Ministry of

Mines led a 25 member Indian delegation comprising representatives from Ministry of Mines, Coal, Steel and its PSEs i.e HCL, NALCO, NMDC and State Governments of Karnataka, Odisha, Goa, Chattisgarh, Jharkhand and Tamilnadu participated in the event. A pavilion of the Government of India of the size of 9m x 2m was set up to showcase the India's capabilities and opportunities in mining sector as well as interests of India's mining industry in African countries. On the sidelines of the event, bilateral meetings were held between Indian delegation led by Secretary, Ministry of Mines and the delegations of Zambia, Namibia and the World Bank when discussions took place relating to mining sector and exchanged information about the reforms held in mining sector in African countries as well as in India.

4th to 7th March, 2018. A 5 member of Indian delegation led by Shri Narender Singh Tomar, Hon'ble, Minister of Mines participated in the event. An Indian pavilion was set up to display the India's reforms, interests and opportunities in mining sector. Hon'ble Minister of Mines also participated in Mining Ministers' meeting of 28 countries organised on the sidelines of the event. He separately, met during the event with Mr. Jimm Carr, the Hon'ble Minister of Natural Resources, Government of Canada and Mr. Wally Schumann, Minister of Industry, Tourism and Investment, Govt of North West Territory, Canada and discussed for the development of the Indian mining sector. India Day was also celebrated on 7th March, 2018.



Indian Delegation in front of Indian Pavilion



Inauguration of India Pavilion by Hon'ble Minister of Mines, Shri Narendra Singh Tomar.

Prospectors & Developers Associations of Canada (PDAC-2018 & 2019):

5.8 The Annual Convention of the Prospectors and Developers Association of Canada (PDAC) is the largest, important and prestigious mining exhibition and conference of the World held in Toronto, Canada. PDAC-2018 was held during

5.9 PDAC-2019 was held on March 3rd-6th March, 2019 in Toronto, Canada. An Indian delegation consisting of representatives from Ministry of Mines, Ministry of Steel, Ministry of Coal, CPSEs like NALCO, NMDC, Coal India Ltd., MECL, HCL and State Govt. like Madhya Pradesh & Gujarat headed by Shri Anil Mukim, Secretary to Govt. of India, Ministry of Mines participated in PDAC 2019 from 3rd to 6th March, 2019 International Conference at Toronto. In addition official

delegation from Ministry of Mines and NALCO delegates attended an exclusive Meeting on Minerals & Aluminium Technology at Vancouver on 7th March, 2019.



Inauguration of India Pavilion by Shri Anil Mukim, Secretary to Govt. of India, Ministry of Mines.

25th World Mining Congress-2018:

5.10 The WMC (World Mining Congress) is the UN affiliated organization, the Secretariat of which is located at Katowice, Poland. The WMC is an international mining event which is held every two years to promote and support both technically and scientifically cooperation for national and international development of mineral areas and resources and to implement a global information network concerning mineral science, technology, economy, occupational health & safety and environmental protection.

5.11 The 25th biannual World Mining Congress-2018 was organized by the Ministry of Investments and Development of the Republic of Kazakhstan in association of Mining and Metallurgical Enterprises (AMME) in Astana, Kazakhstan during 19th to 22nd June, 2018. In this event, more than 2,389 delegates from 50 countries participated. An Indian delegation led by Shri Suresh Kumar, Additional Secretary,

Ministry of Coal participated in the event. Shri Amit Saran, Director, Ministry of Mines and Shri B.L.Kotriwala, Regional Controller of Mines, Indian Bureau of Mines were part of the Indian delegation.



Indian delegation of the 25th World Mining Congress (WMC), 2018

Expo Mina Peru-2018:

5.12 The ExpoMina Peru is an international mining exhibition, which takes place every two years in Lima. It is the largest fair of its kind that is specialized in products and services for the mining industry. Expo Mina Peru-2018 was held during 12th to 14th September, 2018. The Indian delegation led by Shri Anil G. Mukim, Secretary, M/o Mines participated in the event.

China Mining -2018:

5.13 China Mining-2018, the largest



Indian delegation led by Shri Anil Mukim, Secretary to Govt. of India, Ministry of Mines at Expo Mina Peru 2018

annual mining event of Asia, was held in Meijiang Convention and Exhibition Center, Tianjin, China during 18th to 20th October, 2018. An Indian pavilion was set up to showcase the Mining opportunities in India and to highlight its strength in mining sector. A Geologist from Geological Survey of India participated in the event on behalf M/o Mines.

The International Mining and Resources Conference-2018 (IMARC-2018):

5.14 The International Mining and Resources Conference (IMARC) is Australia's largest annual mining event. It brings together the global mining leaders to connect policy makers, investors, technical experts and commodity buyers. IMARC-2018 was held in Melbourne,

Australia during 29th October to 1st November, 2018 where more than 90 countries participated in the event. A 14 member Indian delegation led by Shri Anil Kumar Nayak, Joint Secretary, Ministry of Mines participated in the event.

5.15 An Indian pavilion was set up during the exhibition showcasing the achievement of India in mining and mineral resources and its interests and opportunities in mining sectors. Shri Anil Kumar Nayak, Joint Secretary made a presentation on the overview of India's mining sector in the Plenary Auditorium of Exhibition area in presence of various investors, miners and mining experts. Meetings were held with the representatives of Queensland Government and Australian Trade Commission at the Government level.



Inauguration of India Pavilion by Shri Anil Kumar Nayak, Joint Secretary to the Govt. of India, Ministry of Mines



Indian Copper Complex (ICC) on the bank of River Subarnarekha



6

**Attached /Subordinate
Offices**

Attached /Subordinate Offices

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Geological Survey of India (GSI)

6.1 Founded in 1851, the Geological Survey of India (GSI) started its voyage to search for and assess coal and mineral resources of the country with regional level exploration. In the 167 years since its inception, GSI has continued to grow and diversify into various geoscientific activities, and delivered colossal contribution in the arena of geosciences as well as in the economic growth of India. One of the oldest Surveys of the world, the history of Geological Survey of India is synonymous with history of development of the infrastructure and industries in India. The main functions of GSI relate to creation and updation of national geoscientific information and mineral resource

assessment. These objectives are achieved through ground surveys, air-borne and marine surveys, mineral exploration, multi-disciplinary geoscientific, geo-technical, geo-environmental and natural hazards studies, glaciology, seismotectonics, and carrying out fundamental research. Outcome of work of GSI has immense societal value. Functioning and annual programmes of GSI assume significance in the national perspective.

GSI, headquartered at Kolkata, has six Regional offices located at Lucknow, Jaipur, Nagpur, Hyderabad, Shillong and Kolkata and State Unit offices in almost all States of the country (**Fig.6.1**). Geological Survey of India is an attached office of the Ministry of Mines.

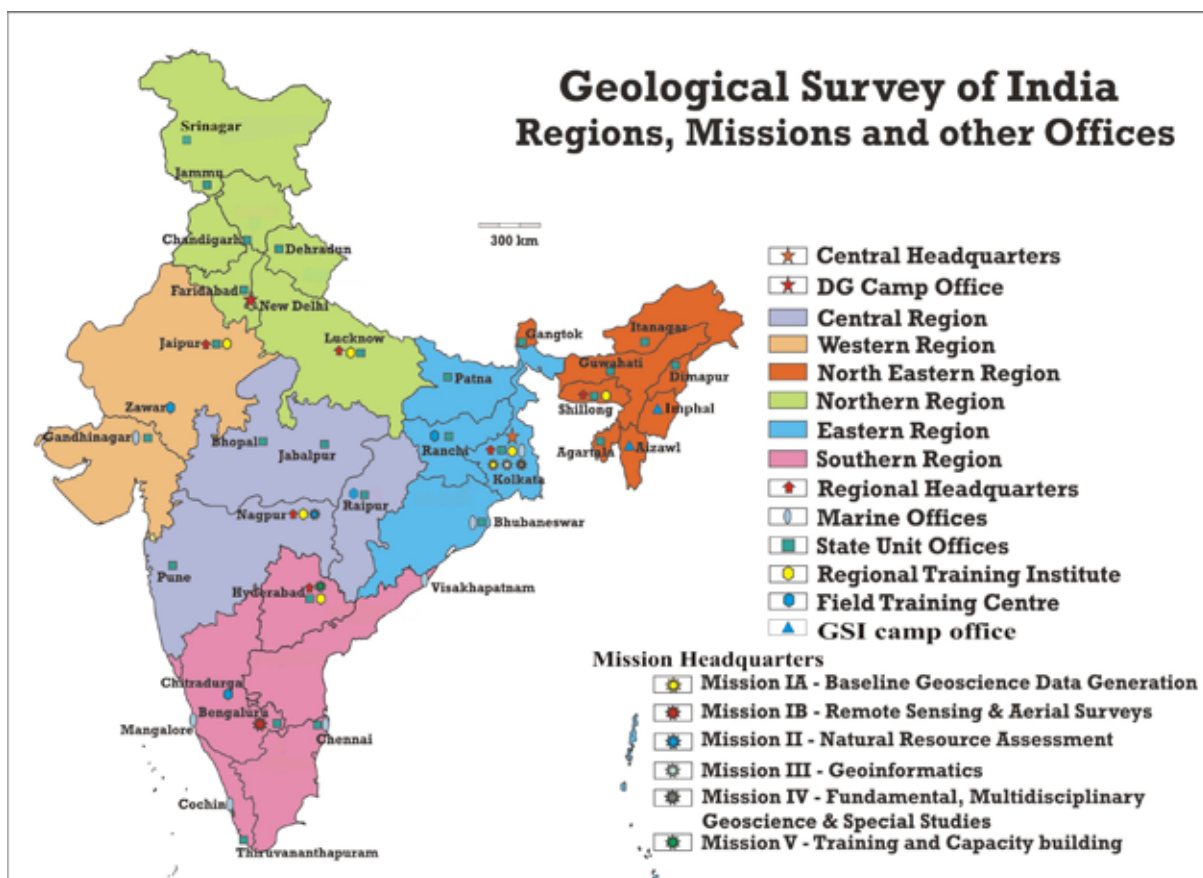


Fig. 6.1

Performance of GSI during 2018-2019

6.2 Summarized performance of Geological Survey of India in terms of physical targets and achievements as per XII plan [2012-13, 2013-14, 2014-15, 2015-16 & 2016-17] and Annual Plan of GSI 2017-18 and 2018-19] is given at **Annexure 6.1 (Page No. 195)**.

Organization of GSI Mission

6.3 The activities of GSI are organized into 5 Missions in line with its future challenges, which are namely, Baseline Geosciences data generation (Mission-I), Natural Resource Assessments (Mission-II), Geoinformatics (Mission-III), Fundamental and Multidisciplinary Geoscience (Mission-IV) and Training and capacity building (Mission-V). Three Support Systems, Policy Support System (PSS), S&T Support System (STSS) and Administrative Support System (ASS) to provide support and cross-cutting co-ordination.

MISSION I: BASELINE GEOSCIENCE DATA GENERATION

6.4 Systematic Geological Mapping (SGM)

Systematic Geological Mapping on 1:50,000 scale is the most fundamental and basic mapping programme pursued by GSI during the last few decades. The whole country, excluding a few patches of inaccessible and difficult terrains, has been covered by the Systematic Geological Mapping. Out of the total mappable area of 3.146 million sq.km of the country, 31,19,080 sq.km has been covered till March 2018 bringing the total coverage up to 99.14%.

Some inaccessible terrains of North Eastern parts of the country in the states of Assam, Arunachal Pradesh, Nagaland, Manipur and Meghalaya (bordering Bangladesh) and in mountainous terrains of the Northern Himalayas in the states of Jammu & Kashmir and Uttarakhand besides the Jarwa/ Sentelenes inhabited islands of Andaman & Nicobar and Abujhmar Plateau of Chhattisgarh and Maharashtra, have not yet been covered by Systematic Geological Mapping. The data generated through this mapping activity has helped to build up the baseline geoscience database for National Geo-scientific information.



Project Implementing Agencies (PIAs) for Multisensor Aerogeophysical Surveys over Obvious Geological Potential (OGP) blocks 1 to 4

6.5 Specialised Thematic Mapping (STM)

The theme-specific mapping in 1:25,000 or larger scale involves collection of multidisciplinary data and is backed by advanced laboratory studies. STM has a pivotal role in prognostication of natural resources and it is also important in environmental analysis, natural hazard recognition, risk evaluation, land use management, and in evaluation of major civil engineering projects etc.

Specialized Thematic Mapping of 2.77 lakh sq km has been achieved till March 2018 and during FS: 2018-19 i.e. from April, 2018 to March, 2019, an area of 23319 sq km has been covered.



Foundation media at Apron portion of Mohanpura Multipurpose Project, Rajgarh, MP

6.6 Geochemical Mapping

The National Geochemical Mapping (NGCM) is a countrywide programme and under this programme, geochemical mapping is carried out in 1:50,000 scale with sample density of one sample per 1km x 1km grid having the objective to generate elemental baseline data for use in managing and developing natural resources including mineral occurrences, in environmental, agricultural, human health, other social concerns.



URL <https://www.gsi.gov.in> launches the home page of OCBIS: the official portal of the Geological Survey of India

Based on the geological mapping of the country, an area of 5.71 lakh sq km, out of total mappable area of 3.146 million sq km, has been demarcated as Obvious Geological Potential (OGP) area, where geological potential for occurrence of

mineral deposit is higher. To cover this 5.71 lakh sq km of OGP area, an area of nearly 8.13 lakh sq km needs to be covered by NGCM which is termed as OGP toposheet area.

Till March 2018, an area of 9.30 lakh sq km containing 7.23 lakh sq km of OGP toposheet area has been mapped by NGCM and during FS 2018-19 i.e. from April, 2018 to March, 2019, an area of 1,75,666 sq km has been covered.

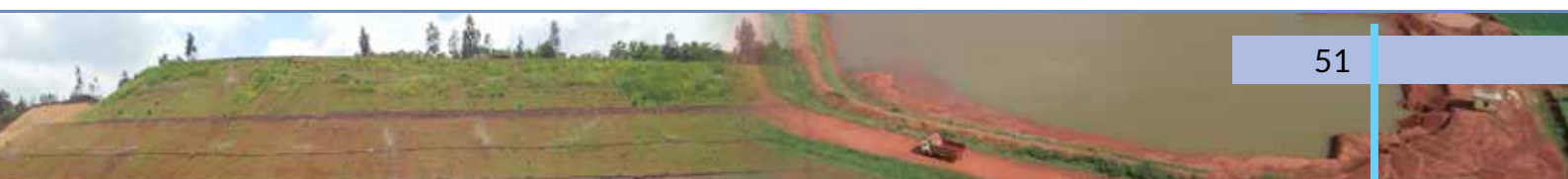
6.7 Geophysical Mapping

The Geophysical mapping under the National Geophysical Mapping Programme (NGPM) comprises ground geophysical survey in 1:50,000 scale. The main objective of the survey is to generate baseline Geoscientific data to generate models to locate and delineate subsurface geological bodies / structures and in postulating conceptual models.

Till March 2018, an area of 5.89 lakh sq km containing 4.52 lakh sq km of OGP toposheet area has been mapped by NGPM and during FS 2018-19 i.e. from April, 2018 to March, 2019, an area of 1,19,068 sq km has been covered.



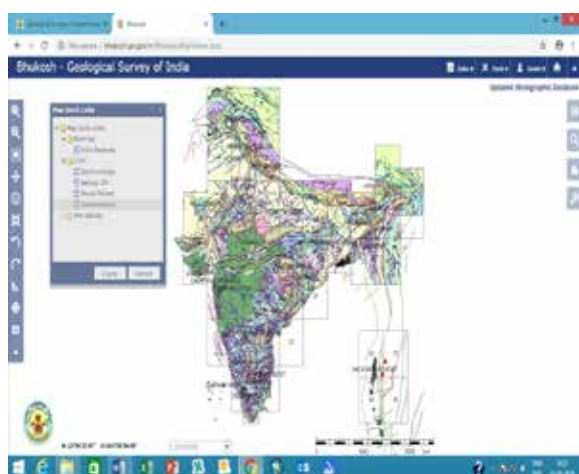
Shri Haribhai Parthibhai Chaudhary, Hon'ble Minister of State (Mines) during the inauguration of the 58th CGPB exhibition.



6.8 Remote Sensing and Airborne Survey

Airborne Geophysical Surveys are being carried out by the Geophysical sensor systems on-board the fixed-wing Twin Otter Aircraft Survey System (TOASS). The TOASS consists of Magnetic and Gamma Ray Spectrometric sensors. The target of TOASS survey for the field season 2017-18 was 69,984 lkm out of which a total of 16,779 lkm was covered till March, 2018. Since the target could not be achieved during FS: 2017-18, the balance work has been taken as spill over items in FS 2018-19 and 10,802 lkm survey has been done during April, 2018. The remaining 42,410 lkm survey was to be covered during FS-2018-19, but could not be covered due to the problems faced by outsourced agency and the same target is carry forwarded to FS 2019-20. The contract period is extended upto Dec, 2019 to complete the work as per the request of the consortium.

The Heliborne Geophysical Survey System (HGSS) was mounted in the GSI owned Dhruv helicopter VT-HAU and the helicopter is being disposed off due to some operational difficulties.



A snapshot of Bhukosh showing layers of geology and Seismotectonic

6.9 Hyperspectral Remote Sensing Technique in Exploration

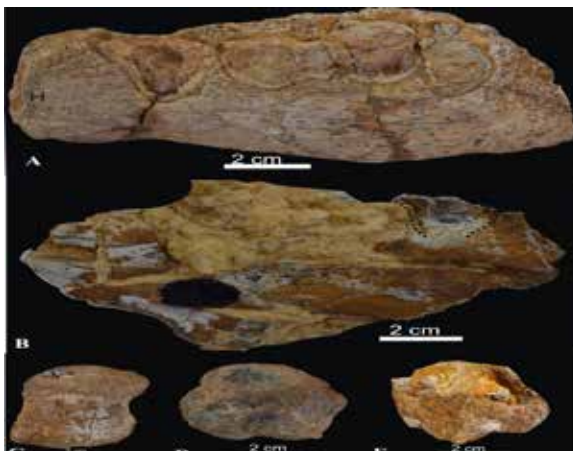
During FS 2018-19, Photogeology and Remote Sensing (PGRS) divisions have taken up mapping of alteration/ mineralized zones on 1:50,000 scale using Multispectral and Hyperspectral remote sensing data and spectro-radiometer covering 9,707 sq.km in potential areas viz. Raipur-Beawar-Ratangarh-Mangaliyawas-Nasirabad areas of Ajmer, Bhilwara, Pali and Udaipur districts, Rajasthan; Harur-Uttangarai Mineral Belt of Dharmapuri district, Tamil Nadu; Kwanu Mineral Belt of Sirmur district of Himachal Pradesh and Dehradun district of Uttarakhand; Sundargarh, Sambalpur and Jharsuguda districts of Odisha; Tikamgarh and Chhatarpur districts of Madhya Pradesh; Kadiri and Veligallu Schist Belt of Karnataka, with the objective of delineating alteration zones associated with mineralization, and building up of spectral library for different litho-units in these areas.

The integration of all Geo scientific data (Geology, Aero-geophysical, Geophysical, Geochemical and Remote sensing) in GIS platform and its modelling for predictive mapping for mineral potential areas is also included in the hyperspectral study for potential area identification.

Synthetic Aperture Radar (SAR) interferometry and morphometric studies are carried out to understand the temporal changes due to ground deformation & neotectonism in sub-Himalayan parts of Arunachal Pradesh and Assam covering 1500 sq km.

An MoU has been signed between GSI and National Remote Sensing Centre-Indian Space Research Organization (NRSC-ISRO) on 05.09.2018 to utilize Advanced Visible Infra-Red Imaging

Spectrometer-Next Generation (AVIRIS-NG) hyperspectral data by the scientists of GSI and ISRO to find surface signatures of mineralization in 14 promising areas in different parts of India in next 3 years. These hyperspectral data acquired through imaging spectroscopy technology may lead to locate new occurrences of lead, zinc, copper, platinum, diamond, gold and other associated minerals in these areas.



First record of Vertebrate Primitive sea animal (Whale) from Bandah Formation (middle Eocene) of the Jaisalmer Basin, Western Rajasthan reported by GSI. A: Fragmentary Mandible of unidentified Cetacean with alveoli B: Fragmentary Mandible showing crown of the tooth with dotted lines. C-E: Vertebrae of unidentified Cetacean.

6.10 Marine and Coastal Surveys

GSI carried out offshore geo-scientific studies both in Exclusive Economic Zone (EEZ) and Territorial Water (TW) along the East and West coasts of India. The main purpose of the Marine Survey is not only to discover the undersea hidden treasure of economic minerals but also to unravel the evolutionary history of formation of seabed morphology and its continuous transformation under the influence of dynamic processes operative on different scales in different parts of the globe.

Till March, 2019, GSI has completed seabed mapping of 1,32,585 sq km out of

1,50,000 sq km within Territorial Waters and 18,67,199 sq km in the EEZ beyond Territorial Waters on reconnaissance scale. The total EEZ coverage including TW is 19,99,784 sq km out of a total EEZ area of 20,14,900 sq km. In addition an area of 3789 sq km has been covered in contiguous zone.

A total of 1,28,073 sq km has been covered for preliminary mineral investigation and 3,320 sq km for Closed Grid Mineral Investigation within EEZ by deploying R. V. Samudra Ratnakar. Significant resource of lime mud has been demarcated within the EEZ off Gujarat and Maharashtra Coasts. As a probable solution to the scarcity of high grade limestone, GSI has delineated potential zone of high grade limemud and limesand within the Exclusive economic zone (EEZ) off Gujarat and Maharashtra. About 72,000 million tonnes of resource has been estimated from an area of 6,603 sq. km of Arabian Sea. The resource is located at 80-100 km from coast at 60 to 120 m water depth.

Potential areas of phosphate bearing sediments, seabed massive sulphides Fe-Mn encrustations, Rare Earth Yttrium and Gas Hydrate bearing zones have been identified within the EEZ of India, besides resource evaluation of heavy mineral placers and construction grade sands within the TW off east and west coasts of India.



View of downstream portal of Kharkai Right canal Project, Seraikela-Kharsawan Districts, Jharkhand

6.11 Multi-sensor Aero-geophysical surveys over Obvious Geological Potential (OGP) and Adjoining areas of India

The Remote Sensing and Aerial Surveys (RSAS), GSI, Bangalore has initiated a Pilot Project during the field season 2016-17 to carry out Multisensor Aero-geophysical Surveys (Magnetic, Gradiometer and Radiometric sensors) over Obvious Geological Potential (OGP) and adjoining areas of about 7.92 lakh sq km within a period of three (3) years. The primary purpose of this project is to collect high quality aeromagnetic and radiometric data to support the identification of target areas for mineral exploration, for metal occurrences. In the 1st year, four different blocks over different geological terrains of the country covering an area of 1.94 lakh sq km has been targeted.

Different Project Implementing Agencies (PIAs) selected by the process of Global Tendering has carried out data acquisition in blocks 1 to 4 and an area of 1.77 lakh sq km (6,51,970 line km) was covered against a total target of 1.94 lakh sq km (7,11,813 line km) till March, 2019 thereby achieving 91.59 % of total target. The final reports of the blocks 1, 2 & 4 have been submitted by respective PIAs to GSI and final report of the block 3 is expected by August, 2019.



Banded quartzite with sulphide mineralization, Ampuli, Papum Pare district, Arunachal Pradesh.

MISSION: II Natural Resource Assessment

6.12 Mineral Resource Assessment

The exploration activities of GSI have been prioritized keeping in view the thrust accorded by the Government of India, the directives given by Niti Aayog, the recommendations of Central Geological Programming Board (CGPB) and State Geological Programming Board (SGPBs).

GSI carries out 'reconnaissance survey' [G4], 'preliminary exploration' [G3] and 'general exploration' [G2] [following the guidelines of United Nations Framework Classification (UNFC) and Mineral Evidence and Mineral Content Rules (MEMC)-2015].

During FY 2018-19, a total of 201 investigation programs have been taken up of which 187 are under 'Mineral resource assessment' (ores and minerals) and 14 belong to 'Natural energy resources' [coal, lignite and geothermal]. Besides these, 17 nos. 'offshore mineral investigation' Marine and Coastal Survey Division (MCSD) projects have been taken up as well as 5 nos. Regional Mineral Targeting (RMT) projects and 2 Research Projects. For targeting of deep seated and concealed deposits, 2 nos. projects under Project: UNCOVER India is being carried out.

6.13 'Mineral resource assessment' (Ores and Minerals):

Among 187 Mineral Resource Assessment Projects, 23 are on Ferrous Minerals (Iron, Manganese and Chromite), 29 Precious Metals & Minerals, 95 for Non-Ferrous and Strategic Minerals, 40 on Industrial & Fertilizer Minerals.

6.14 'Natural energy resources' [Coal and Lignite]:

GSI has augmented coal resource in different states and the total resource of coal of the country stands at 3,19,020.33 million tonnes and that of lignite stands at 45,663.58 million tonnes as on 01.04.2018.



Malachite stain within garnetiferous quartz mica schist exposed SE of PakkeKessang, East Kameng district, Arunachal Pradesh.

6.15 Geothermal Studies:

During the FS 2018-19, geothermal studies are being carried out in Maharashtra, Telangana and Uttarakhand.

Mission III- Geoinformatics

6.16 Mission-III actively involved in national and international collaborative initiatives concerning dissemination of geo-information. The Data Sharing and Accessibility Policy, GSI 2019 has been notified on 12.02.2019 and the Policy is effective from 1st March, 2019.



View of Kotlen Landslide, Noney District, Manipur.

6.17 Mission IIIA- Data Repository and Management:

The Online Core Business Integrated System (OCBIS) project is in furtherance to the organizational IT enablement to help Geological Survey of India in efficiently and securely manage and share its huge data / information repository. The users of OCBIS get an integrated system with URL <https://www.gsi.gov.in>, i.e. a web-based platform, which connects - core processes and related data and support systems. OCBIS aims at comprehensive data management through integrated database schema and repositories to house all geoscientific as well as administrative information. This is an open standards based IT platform which has its enhanced IT capabilities to effectively exchange information with external stakeholders (it includes Ministry of Mines), national and state level earth science organizations / departments, industry and citizens.

Mission IIIA is entrusted with maintaining the OCBIS Enterprise Database and the Repository Infrastructure. The 29 modules including e-governance application are developed and rolled out since April, 2017. Most significant components of OCBIS are as follows:

BhuKosh, the integrated spatial data management portal facilitates the users to visualise, query data, create maps and download. Users can access a host of geoscientific data pertaining to Geological mapping, Geochemical mapping, Geophysical Mapping, Aerogeophysics, Seismotectonics, Landslide, Geochronology and meteorites in the form of OGC compliant map services.

The FSPMIS module takes care of the complete project activity from formulation,

approval, execution, monitoring, preparation and submission of report and any resulting publication from the project. FSPMIS is integrated with other information systems like Laboratory Management System (LMS), Drilling Management Information System (DMIS), and Vehicle Management Information System (VMIS) and specifically with Content Management and Field Application which is used for field data collection.



Phosphatic nodule, collected from Larket village, Litang valley, East Jaintia hills district, Meghalaya.

Museum artefacts have been digitally captured from GSI Museums at Nagpur, Jaipur, Lucknow and Saketi, Central Headquarters and organised in Virtual Museum. This museum gives an opportunity to the users to visualise high quality photographs of the specimens including 3D view.



View of Kikruma Landslide Phek & Kohima Districts, Nagaland.

Infrastructure for digital data collection from field aided by GPS integrated mobile field devices has been introduced in GSI from FS 2017-18. The theme based field applications has been created to collect sample / observation points and data from the field in both online and offline mode. The field records are directly uploaded to the central raw data repository at OCBIS data centre for ready consultation and archival. The field device is a very rugged one and can withstand dropping impact up to 5 feet, water and dust. It has long-life, user-replaceable battery and sunlight-readable, high-sensitivity 7 inch multi-touch screen. These devices are fed with all relevant data, including maps from headquarters for consultation during field work. During field work, the devices facilitate collection of sample information / observation data from the field in both online and offline mode, and thus minimising loss of information from the observation point in field. The field observation can directly be synchronised with the Central repository in servers at data centre for ready consultation by Project team.

Support services like, CGPBIS, Grievance, RTI, Legal, Rajbhasha, Parliamentary questionnaire, are some of the other applications. Application "WRITE2DG" is designed for general people and employees for writing to the DG, GSI to quench their inquisitiveness. Elaborate training and hands-on sessions are continuing in batches for each module released for a hassle-free migration experience to the grand New OCBIS Portal.

The unpublished progress reports and maps are being uploaded through FSPMIS to make the OCBIS Project a comprehensive repository of GSI data holding. GSI is looking forward towards making the

invaluable data gathered over 160 years, available to all authorised stake holders, with increased usability and flexibility.



Debris slide about 1.5km North of Sailulah Village on East Lungdar-Sailulah PMGSY road, Mizoram

6.18 Mission IIIA - IT Infrastructure and Connectivity

Mission IIIA is also responsible for implementing, managing and maintaining the ICT Infrastructure and Connectivity in GSI. The IT infrastructure include Local area Network at all offices, Wide Area Network (WAN) connecting the local networks through a MPLS based Virtual Private Network (VPN); Data Centre and Disaster Recovery (DR) Centre operations; IP telephony and HD Video-conferencing facilities as well as various connectivity links.

State-of-art Tier-II Data Centre (DC) at Kolkata and Disaster Recovery Centre (DRC) at Hyderabad hosts Enterprise portal, the GIS portal (Bhukosh) and applications accessed through Internet by public and GSI intranet by employees. Regular data replication happens between DC and DRC and in case of failure of Data Centre, portal and critical applications are made available from the DR Centre.

For maintaining failsafe network connectivity between DC-DRC and other offices, GSI has implemented dual connectivity from two different connectivity providers with automatic failover. Border Gateway Protocol (BGP) configuration by the providers with single AS number for MPLS (VPN) links ensures automatic failover between primary and secondary links at different offices of GSI if one link fails.

Apart from Enterprise portal, Bhukosh and other applications, GSI has established robust e-mail, VoIP (IP telephony) and HD Video-Conferencing infrastructure. Every employee has been provided with GSI mail account. Divisional mail accounts are also operational for the administration-cells / technical-divisions of HAG-SAG Post Holders and important Divisions to cater to the needs of day to day technical / administrative communications. This effort and applications of OCBIS is a stage setter for a paper less office. Group-mail-ids are in use for conveying notices/ orders/ decisions to implementers/ group of employees. Frequent official meetings are conducted within GSI as well as with the Ministry and other organizations through video-conferencing. This is now considered as the most effective means to conduct meetings / reviews.



Folded Gondwana rocks

6.19 Mission IIIB – Publication & Library

The major categories of GSI publications are Memoirs, Bulletin Series A, B & C, Records, Special Publications, Miscellaneous Publications, Catalogues, Palaeontologia Indica and Indian Journal of Geosciences- the in-house quarterly journal of GSI published on regular basis and uploaded in the OCBIS portal as per the existing data sharing and access policy of GSI of 2014. A Memoir contains detailed reports on complete surveys and investigations detailing either with a particular region or with a particular mineral in one or more regions. Records mainly covers brief outline of activities of GSI for different Regions and CHQ. The economic geology releases under Bulletin Series A, engineering geology and ground water under Bulletin series B and Bulletin series C documents the basic data generated by various laboratories/specialised divisions. Special Publications include the proceedings in various symposia and seminars organised by GSI as well as a set of papers dedicated to a particular field of study in earth science or some special projects. Miscellaneous Publication is a consolidated document on Geology and Mineral Resources of different States of India.

During FS 2018-19, eighteen scientific publications have been released.

VAQ Book: Programme for Enhancing Visibility, Activity & Quality of Geological Survey of India (100 X 100 VAQ Programme) released during August 2018.

VAQ Brochure: Programme for Enhancing visibility, Activity & Quality of Geological Survey of India (100 X 100 VAQ Programme) released during August 2018.



Release of publications during the 58th CGPB meeting.

Central Library-With introduction of digital database management and development in the department, the Central Library is also poised to switch into digital era by providing bibliographic metadata of library resources through Online Public Access Catalogue (OPAC) converting all GSI publications and unpublished progress reports pertaining to CHQ into soft copy formats (both are uploaded in GSI portal). Central Library has disseminated selective information on library materials in the form of quarterly products like SDRI i.e. Selective Dissemination of Recent Information on Indian Geology; CAS i.e. Current Awareness Service and ESA i.e. Earth Science Abstracts through GSI Portal and circulated to reputed Indian Universities/ Institutions as per schedule.



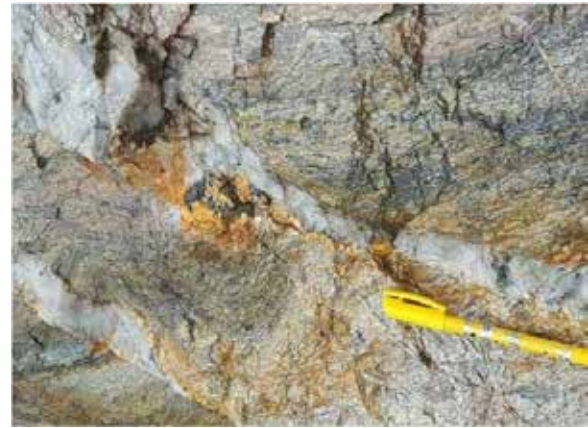
Handing over the Mineral Exploration reports to the State Government during the 58th CGPB Meeting

National Digital Library (NDL): GSI is an institutional member of NDL project. Transmission of metadata in compatible format for NDL database is under testing procedure.

6.20 Mission IIIC – Map, Geoinformatics & Data Integration

GSI, has been mandated to prepare both analog and digital geological maps / map databases for the entire country, and publication of the same. Following this, Maps like Geological Quadrangle Maps (GQM) of (83G, 83M, 83N, 91H & 92E Degree-sheets of NER), District Resources Maps (DRM) of (Barabanki and Barielly districts of UP; Dehradun, Haridwar and Teri-Garwal districts of Uttarakhand), Geological and Mineral Maps of States (Telengana, Entire North Eastern Region, Arunachal Pradesh, and Rajasthan), Mineral Belt Maps (MBM) of (Sausar Mobile Belt of CR & Potash Belt of Shonbhadra District UP), Coal Field Maps of (Rajmahal – Birbhum Master Basin of WB), Marine Maps etc., several thematic maps covering pan India are in final stages of compilation under this Mission. The Mission is also compiling and preparing a separate geodatabase for Thematic Geological Maps in 1:25K scale of selected belts of India in ER, CR, WR, NR, SR & NER, where such mapping has been carried out by GSI. The compilation and publishing the Sea Bed Sediment Maps of Territorial Water (TW) and Exclusive Economic Zone (EEZ) is also carried out in a regular basis. The Mission has already completed all India Projects like “Revision of Seismotectonic Atlas of India and its Environs [SEISAT] updating it to digital (GIS) version”, “Stratigraphic Database in India in 1:50K scale upto lithounit level with stratigraphic hierarchy,

colour coding and stratigraphic notation” and “Theme based compiled geological map on Granite / Granite Complex of India”.



Quartz vein within meta volcanics with pyrite mineralisation, West khashi hills district, Meghalaya.

In addition, Mission IIIC is also updating and maintaining the Geodatabases, Map services and map related thematic applications in BhuKosh (OCBIS GeoPortal).

Moreover, Mission IIIC is presently pursuing the following all India projects in GSI Central Headquarter:

- Compilation and Updation of 1:2M Geological Map of India in Digital Format.
- Synthesis and collation of All India National Geochemical Map data (NGCM) and National Geophysical Map data (NGPM) on 1:50K scale and uploading in BhuKosh (OCBIS GeoPortal).
- Creation of National Geoscience Data Repository (NGDR) in GSI.
- Creation of Theme based compiled geological map on Ultramafic rocks / suites of India.

6.21 MISSION: IV Fundamental and Multidisciplinary Geosciences and Special Studies

National Mission-IV, with Headquarters at Kolkata is structured under three submissions: 1. Geotechnical & Geohazards management (M-IVA) 2. Climate change & Eco systems, Polar Studies, Environmental Geology, Medical Geology & Biogeohazards (M-IVB) and 3. Fundamental Geosciences & Research (M-IVC). During the FY 2018-19, 176 standard items have been executed under Mission-IV which includes 88 items of M-IVA, 20 items of M-IVB and 68 items of M-IVC.



Graphite body in sheared metasedimentaries, Khetabari Formation, Pakro, East Kameng district, Arunachal Pradesh.

The major activities pursued by GSI in M-IVA domain for developmental and societal issues are that of Geotechnical, landslide and seismo-tectonic studies. During FS: 2018-19, 20 items related to geotechnical investigations have been taken up to provide geological and geotechnical inputs to the project authorities. People-centric Landslide-Early Warning System (P-LEWS) was successfully launched in Darjeeling district of West Bengal to sensitize the public about landslide. GSI has installed 22 nos. of permanent GPS stations for the ground deformation studies.

Under M-IVB domain, the glaciology projects are mainly related to the study of recessional pattern and mass balance of the glaciers in Higher Himalayas and identification of potentially vulnerable areas for high glacial Lake Outburst Floods (GLOF) risk. Polar researches are mainly devoted to Ice Sheet Dynamics both in Arctic and Antarctic with special reference to climate change. In the Antarctic Region, study of hard rock geology and thematic mapping of the Archaean-Precambrian terrains are also being carried out. In Environmental studies geogenic contamination of groundwater is being carried out.



Contact between Upper Sylhet Limestone and Upper Sylhet Sandstone, Litang valley, East Jaintia Hills district, Meghalaya

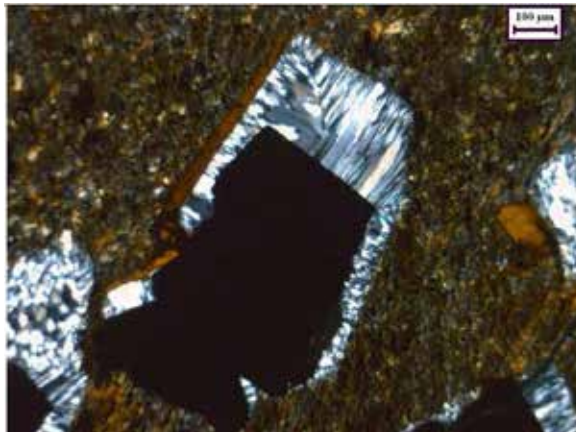
In M-IVC, the Fundamental Researches in three principal branches of geosciences viz., Petrology, Palaeontology and Geochronology & Isotope Geology have been carried out by utilizing state-of-the-art advanced instrumentation like EPMA, SEM-EDX, LA-MC-ICPMS, LA-Q-ICPMS, Raman Spectroscopy, fluid inclusion stage, XRD, XRF, AAS, FTIR etc by NCEGR and Regional Laboratories. First record of Vertebrate Primitive sea animal (Whale) from Bandah Formation (middle Eocene) of the Jaisalmer Basin, Western Rajasthan has been reported by GSI.

MISSION: V Training and Capacity Building

6.22 Human Resource Development

Geological Survey of India Training Institute (GSITI) is presently running training programmes at 09 sites across India. These are 1) Hyderabad, 2) Nagpur, 3) Lucknow, 4) Kolkata, 5) Shillong, 6) Zawar-Jaipur, 7) Chitradurga (Karnataka), 8) Kuju (Jharkhand) and 9) Raipur (Chhattisgarh).

Hyderabad Center is designated as headquarter for all other eight centers and it has specialized Divisions for Laboratory and Classroom trainings. Besides, regional trainings of Southern Region are also imparted from Hyderabad Center. Sl. Nos. 2 to 5 are Regional Training Divisions (RTDs)



Microphotograph of Strain fringe development on pyrite porphyroblast

operating from Hyderabad Headquarters but located at respective Regional Offices. These Regional Training Divisions cater to the regional training requirements and impart training in different disciplines of earth sciences. Out of nine centers listed above, last four sites are Field Training Centers, where officers are trained in different field based geoscientific themes with their unique geological features. All these four centers have their own logistic setup.

In addition to conducting the different induction level training programs for Geologists, Geophysicists, Chemists and Engineers, the institute conducts training for middle level professionals by organizing Basic, Refresher, Advance courses, Workshops, etc. in various disciplines of geosciences for scientific, technical and administrative streams.

Besides, the Institute has been imparting sponsored training in collaboration with Indian Space Research Organisation (ISRO) & Ministry of External Affairs (MEA). Courses were also conducted on payment basis to the officers of Oil and Natural Gas Corporation Ltd. (ONGC) and Odisha Mining Corporation Ltd. (OMC). The Training Institute has also outreached different Central and State Departments like Indian Institute of Management (IIM) Kolkata and Shillong, Management Development Institute (MDI) Gurgaon, Management Development Institute (MDI) Murshidabad, Administrative Training Institute (ATI) Kolkata, Jaipuria Institute of Management (JIM) Lucknow, Administrative Staff College of India (ASCI) Hyderabad, Dr. Marri Chenna Reddy Human Resource Development Institute (MCRHRD) Hyderabad, HCM Rajasthan Institute of Public Administration (HCM-RIPA) Jaipur, Institute of Secretariat Training and Management (ISTM) New Delhi, Institute of Management Training (IMT) Nagpur, National Institute of Financial Management (NIFM) Faridabad, etc. for various training courses.

Geological Survey of India Training Institute (GSITI) and the Indian Institute of Technology (Indian School of Mines), Dhanbad have signed a Memorandum of Understanding (MoU) on collaboration for academic and research programs leading to award of Ph.D. Degree.

During FY 2018-19, two international courses each on Remote Sensing & Digital Image Processing, and Geographic Information System were conducted for foreign nationals under ITEC program sponsored by MEA. Also, 92 out of total 115 training programs were made open for State DGMs, other organizations and Universities.

During FY 2018-19, a total of 165 (115 FSP + 50 additional) programmes were conducted. The total number of personnel trained is 4108, out of which 3468 are from GSI, 279 are from State DGMs, 174 are from Other Organizations, 150 are University/College students/lecturers and 37 International participants. Under the umbrella of BHUVISAMVAD, a total 91 nos. of training programs were conducted with 4695 participants comprising students and teachers from different Universities / Colleges / Schools.

6.23 Central Geological Programming Board [CGPB]

The Central Geological Programming Board (CGPB) is an apex body at national level to overview the advancement of geoscientific activities undertaken by various organizations/agencies especially in mineral exploration in our country. The Secretary (Mines) is the chairman of CGPB. Geological Survey of India (GSI) is the nodal department (Member Secretary) and the State Geology and Mining departments, Central Government institutions and other stakeholders are its participating members.

The 58th Meeting of the Central Geological Programming Board (CGPB) was held on 15 February 2019 at the National Agricultural Science Centre (NASC) Complex, Indian Council of Agriculture Research (ICAR), New Delhi. Shri Haribhai Parthibhai



Shri Haribhai Parthibhai Chaudhary, Hon'ble Minister of State (Mines) addressing the gathering during 58th CGPB Meeting.

Chaudhary, Hon'ble Minister of State (Mines) graced the occasion as chief guest and inaugurated an exhibition displaying the status of "Mineral Exploration in India". The meeting was held under the chairmanship of Shri Anil Mukim, Secretary to the Govt. of India, Ministry of Mines (MoM). Dr. K. Rajeswara Rao, Additional Secretary, MoM, Dr. Dinesh Gupta, Director General, Geological Survey of India (GSI), Shri R S Garkhal, Additional Director General, GSI, Shri Bipul Pathak, Joint Secretary, MoM were the other dignitaries to grace the meeting of the Board.

Representatives from 27 State DGMs, 6 ministries and 35 organizations (Government Organizations, stakeholders from industries and invitees from public/private organizations) participated in the 58th CGPB meeting.

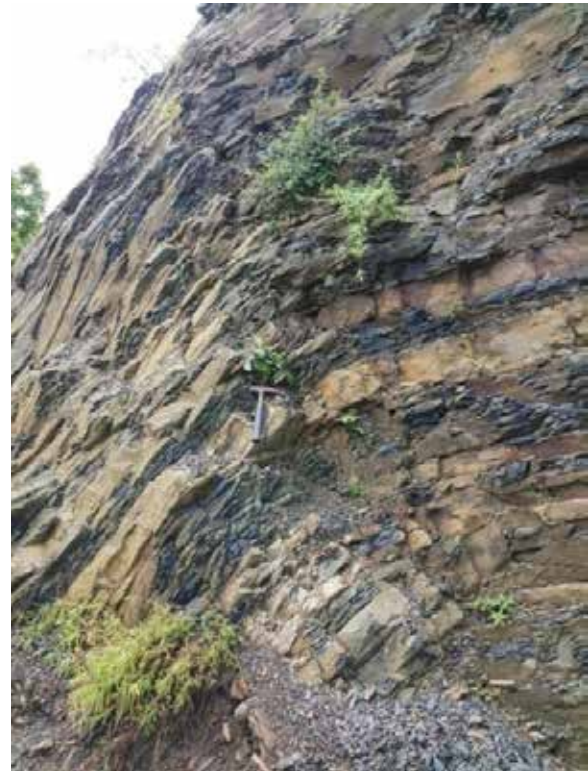
During the occasion, seven publications (five from GSI and one each from Neyveli Lignite Corporation and DMG, Chattishgarh) were released. Twenty Mineral Exploration reports worth Rupees seventy nine thousand five hundred sixty crore (INR) were handed over to the seven state governments viz., Odisha, Rajasthan, Madhya Pradesh, Haryana, Karnataka, Andhra Pradesh and Kerala.

During the 58th CGPB Meeting, 897 proposed regular programmes for field season 2019-20 were approved by the chair.

The main agenda of the 58th CGPB focused on various technical and administrative issues regarding identification of mineral blocks and their auctioning in each mineral bearing state. It is proposed to provide all the necessary support by GSI and other stakeholders to the north-eastern states for resolving their technical issues. It was emphasized that every recommendation of VAQ has to be achieved and GSI needs to follow up the recommendations to meet the milestones in a time bound manner with active participation of all stakeholders.

6.24 ISO certification of Chemical Laboratories & Central Headquarters

The Central Chemical Laboratories (XRF and ICPMS laboratories) at CHQ and the Regional Chemical Laboratories at NRO, SRO, WRO, CRO, ERO have been accredited by National Accreditation Board for Testing and Calibration Laboratories, Government of India (ISO/IEC 17025:2005). For an accredited laboratory to maintain its accreditation status, it is mandatory that the laboratory continues to comply with the requirements of ISO/IEC 17025: 2005 and NABL specific criteria(s) for applicable field(s). The Reassessment of all the laboratories has been done in the field of Testing as per ISO/IEC 17025:2005. The revised accreditation certificate has been issued. All the laboratories have to participate Proficiency Testing (PT) Program (GeoPT Program) at regular intervals. All the Chemical laboratories have qualified the GeoPT-38/39 with satisfactory Z-score.



Rhythmite of Disang Formation, Kohima District, Nagaland.

6.25 Quality Management (QM) Cell of GSI

The activities of Quality Management (QM) Cell is being carried out by PSS-P&M-5, CHQ, GSI, Kolkata. The mandate of QM Cell is to devise methodology and various modus operandi in the form of Standard Operating Procedure (SOP) for improving the quality of services provided by GSI so as to ensure customer satisfaction and also to strive for meeting international standards. Accordingly, SOPs are formulated, for various activities of GSI, and implemented for compliance.

Directives are provided regularly by the QM Cell to service providing Divisions and Laboratories, situated in six Regions and CHQ of GSI. It is also monitored that the guidelines prescribed in the SOPs are strictly followed and upgraded time to time to keep the quality of the work



Khetri Plant

at par with the international standards. The supervisory officers of the service providing Divisions and Laboratories of GSI are entrusted the responsibility to look into the quality of services, as per SOPs, which are being provided to the clients/stakeholders like Central/State Govt. bodies, Public Sector Undertakings (PSU), Private Companies engaged in geo-scientific activities, Universities and Colleges, CSIR Labs and General Public.

The QM Cell is responsible for monitoring the quality of the projects taken in every Field Season Programme (FSP) of GSI. The QM Cell will undertake external peer review of 20% of the items proposed for FS 2019-20 pertaining to six Regions, Central Facilities (CHQ) of GSI.

As per the mandate, the QM Cell had undertaken external peer review of 20% reports of FS 2016-17 circulated during FS 2017-18. Out of 568 standard reports submitted by the six Regions and Central facilities (CHQ) of GSI, 90 reports were randomly identified (domain-wise) from various Regions/Divisions of GSI and were peer reviewed by external experts before final circulation in the GSI Portal. A total of 107 items pertaining to FS 2018-19 were

externally peer reviewed.

6.26 Internal Resource Generation

During the period from 1st April, 2018 to 31st March, 2019, a total of ₹5,03,20,714.00 + \$66.5 (Rupees five crore three lakh twenty thousand seven hundred fourteen and sixty six and a half dollar only) has been generated as Internal Resource and ₹ 75,79,948.00 (Rupees seventy five lakh seventy nine thousand nine hundred forty eight only) collected as GST (Service Tax and Cess) by way of undertaking various commercial activities such as sponsored commercial geotechnical works; sharing of data; multidisciplinary & fundamental research; sale of maps, unpublished reports; providing analyses of samples (petrological/ chemical/mineral physics/ geotechnical Labs.), EPMA studies, gem testing, mineral exploration, etc.

6.27 International Cooperation

The activities of Geological Survey of India in the field of International Cooperation include monitoring Bilateral Collaborative programmes (MoU) with various other foreign governmental organisations/ scientific agencies, as well as coordinating GSI's participation in International Seminar/ Symposia, bilateral partnership with other countries for knowledge acquisition, skill & technology transfer in India/abroad and facilitate foreign visits to India for programmes/trainings, visit of expert team abroad (in conjunction with International Division, GSI, CHQ).

During the F.S: 2018-19, the division was involved in providing and facilitating technical and associated inputs from GSI pertaining to bilateral activities with Canada (collaboration with NRCaN for PGE

Exploration and monitoring of Landslides upto June 2018), Australia (Extension of TOR with Geoscience Australia for capacity building and technological upgradation of GSI), Bangladesh (proposals from GSB for Mutual Scientific Cooperation in the field of Earth Sciences), Equatorial Guinea (To develop a plan of preliminary exploration on geological mapping), Peru, Russia, Uzbekistan (related to formulation of MoUs), Bhutan & Nepal (related to geotechnical consultancy services from GSI in various hydroelectric projects). MoU between GSI and GTK, Finland, Zimbabwe, Tajikistan, Brazil, Tunisia, Cote D' Ivory were prepared and sent to Ministry.

6.28 Bilateral Collaborative Activities

GSI continued its participation in bilateral cooperation and collaborative programmes with other countries on several geoscientific arenas for mutual benefit. Ministry of Mines as well as GSI had entered into MoUs with different countries in various spheres of geosciences.

6.29 Collaborative Projects with Other Organisations



Development of haul roads

A total of 53 programmes have been taken up on request or sponsorship. Out of these 53 programs, 16 have been taken up on State request, 8 under collaboration with National Agencies (BARC, Mumbai; HSHDB & ONGC; CGWB; IIT, Dhanbad; NIO; ONGC), one collaboration item with Calcutta University, four International collaboration items (two with Geoscience Australia and two with BGS), four sponsored training items (2 sponsored by MEA, 2 by ISRO) and 20 Geotechnical items have been sponsored by various agencies.

6.30 Modernization programme in GSI

In order to establish GSI as a world class geoscientific institute, the modernization programme has been started since the XI Five Year Plan on the advice of the Parliamentary Standing Committee on Industries and as per guidelines laid down by an expert panel on Modernization of GSI, constituted by the Ministry of Mines, who were entrusted to improve the functioning of GSI in its different activity domain including exploration for assessment of natural resources by infusion of latest state-of-the-art technology.

During XII Plan period GSI received a total Plan budget of ₹ 1741.12 crore, out of which an amount of ₹ 658.80 crore was allotted for Modernization & Replacement scheme. GSI achieved a total Plan expenditure of ₹ 1736.04 crore including ₹ 660.50 crore under Modernization & Replacement scheme. The modernization budget of

GSI had been scaled up as the major expenditure during FY 2012-13 and FY 2013-14 for instalment payment of Ocean Going Research Vessel 'Samudra Ratnakar'.

The details of actual expenditure of the total XII Plan budget under the Modernization & Replacement scheme are shown in **Table 6.1**.

During the FY 2017-18, GSI received a total capital grant of ₹ 107.30 crore for its modernization activities, out of which GSI utilised a total of ₹ 83.85 crore for modernization of different laboratories, exploration equipment and instalment payment of ₹ 25.00 crore for Geotechnical vessel (GTV). During F.Y. 2018-19, GSI has received a capital grant of ₹ 168.40 crore under Modernization & Replacement scheme out of which ₹ 125.00 crore has been earmarked for instalment payment for GTV at BE stage. However, due to failure in fulfilment of different conditions by the vendor for procurement of GTV, the

rescindment process has been initiated. GSI has utilised a total of ₹ 21.62 crore out of its capital grant till the end of September 2018.

The induction of new Ocean going Research Vessel 'Samudra Ratnakar' with state-of-the-art equipment in the fleet of GSI's research vessels has enhanced the off-shore exploration capability to a great extent. This vessel can probe up to a depth of 30 m below sea floor with the help of many other high precision sensor survey data for delineating the disposition of the off-shore mineral resources. The detailed marine geological exploration as 'National High Resolution Seabed

Mapping and Resource Evaluation within EEZ of India and beyond' is being carried



Lighting of the lamp by Shri Haribhai Parthibhai Chaudhary, Hon'ble Minister of State (Mines) during the inauguration of the 58th CGPB meeting.

Table 6.1
Details of Actual Expenditure of XII Plan Budget under the
Modernization & Replacement Scheme

(₹ in crore)

Scheme	2012-13*	2013-14*	2014-15*	2015-16*	2016-17*	Total
Modernization & Replacement	152.48	351.49	39.61	66.41	50.51	660.50

* actual expenditure

out since its flagging off in December, 2013. The maps produced during sea bed mapping are being used for identifying off-shore mineral deposits, placer deposits etc. and they can also be used for development of ports and harbours etc.

GSI is taking up G2 stage exploration in addition to G3 & G4 stage of exploration under UNFC from the field season 2015-16 with an aim to generate more number of auctionable blocks. It involves detailed exploration with close spaced drilling. Further, in view of the steady depletion of available surface or near-surface mineral resources, GSI has changed its exploration strategy and has commenced searching deep seated and concealed deposits with the help of advanced techniques since the year 2016-17 with the technical guidance of Geoscience Australia under 'Project Uncover'. This Project Uncover is aimed for research, plan and execute projects for probing deep seated and concealed mineral deposits with the help of advanced geophysical techniques and mineral system approach. Such programmes need the support of high capacity drilling rigs and sophisticated laboratory instruments. GSI is in the process of procurement of such sophisticated deep drilling rigs as well as laboratory instruments in phased manner.

GSI has launched an ambitious project

"National Aero-Geophysical Mapping Programme (NAGMP)" in 2017 to acquire uniform aero-geophysical data over the Obvious Geological Potential (OGP) areas in a fixed time frame through outsourcing. This pilot project is aimed to provide a variety of information including data on the concealed and deep seated structures capable of hosting mineralization and the same will be of immense help for exploration activities in the country. Survey work of this programme is in progress. In addition, GSI is also carrying out aero-geophysical surveys with its own Twin Otter Airborne Survey System (TOASS) in different selected areas of the country as per planned and approved field season programme.

With an aim to achieve paperless office, GSI has implemented OCBIS project and it became operational from April



Herringbone cross stratification present in buff to light brown sandstone on Seling to Thingsul village road section.



Dalli Manual Mines

2017. OCBIS will enable all geoscientists and administrators of GSI to collect, process, analyse, store and disseminate GSI data and information in an efficient and organised manner. Besides, OCBIS will enable the geoscientific community outside GSI to easily access and utilise the GSI data and information, and will also provide infrastructural support to the national e-governance initiatives. GSI has taken initiative for setting up of National Geoscience Data Repository (NGDR) with the aim of making available multi-disciplinary, multi-thematic data from number of Government, PSUs and private agencies, which deal with geospatial data and applications in the domains of Mineral Exploration to stakeholders through a single window.

To improve the capabilities in the field and laboratories for generating various types of earth science data and their processing for proper interpretation as well as to give support to operational activities of GSI, many machineries and equipments are being procured in a phased manner.

During 2016-17 and 2017-18 the major procurements include petrological, chemical, geophysical and drilling instruments eg. Gravimeters, Magnetometers, GPS instruments, Microscopes, Mercury analyser, Broad Band Digital Seismographs, seismological instruments for DRPC, ICPMS; DGPS instruments, high capacity drilling rigs and several drilling accessories, etc.

The major geological, chemical, geophysical and drilling instruments procured in 2018-19 include Electron Probe Micro Analyser, Semi-automatic thin section preparation machines, 3D Terrestrial Laser Scanner, HGPS, Piston Cylinder apparatus, Graphite Furnace Atomic Absorption Spectrometer, WD-XRF instruments, Gravimeter, SEM-EDS Based Automated Mineralogy Solution, Geophysical Logger Units, Microscopes, drilling rigs of different capacity and drilling accessories etc.

For the FY 2019-20, GSI has provisioned ₹ 101.40 crore under 'Modernization & Replacement' scheme / activity to



procure hydrostatic drilling rigs, high end laboratory and field instruments as per VAQ recommendations, field vehicles / trucks, water tankers, etc.

of GSI against the approved plan grant during the FY 2016-17, the Scheme / activity wise expenditure against the total approved budget of FY 2017-18 and 2018-19 is presented in **Table 6.2**.

6.31: Scheme wise plan budget expenditure

Table 6.2
Year-wise Scheme-wise / Activity-wise Financial Performance of GSI Against the Approved Plan Outlay during the Last Two years (2016-17, 2017-18, 2018-19)

(₹ In crore)

Scheme / Activity	2016-17			2017-18			2018-19		
	BE Grant (Plan)	RE / FE Grant (Plan)	Actual Expenditure (Plan)	BE Grant	RE / FE Grant	Actual Expenditure	BE Grant	RE / FE Grant	Actual Expenditure
Survey and Mapping	118.68	106.51	105.71	82.70	81.03	80.86	76.25	78.15	78.04
Mineral Exploration	54.88	63.04	63.01	52.20	45.50	45.45	39.85	44.41	44.32
Special Investigation	10.03	9.46	9.26	1.97	1.98	1.96	2.00	1.97	1.92
Research & Development	14.32	10.53	10.44	7.15	8.75	8.69	8.43	10.09	10.02
Information Dissemination	79.91	78.12	77.73	37.05	54.30	54.07	36.70	48.55	48.50
Human Resource Development	21.47	19.60	19.62	4.20	3.19	3.14	8.76	8.66	8.59
Modernization & Replacement	171.64	50.12	37.19	154.30	107.30	83.85	168.40	73.40	72.84
TSP	12.70	12.70	12.51	11.00	11.00	11.01	8.00	10.63	10.59
Administrative Support Activity	*	*	*	78.43	85.95	75.62	105.73	124.07	115.01
Establishment Expenditure \$				598.87	628.87	627.13	603.75	626.12	625.79
Total	483.63	350.08	335.47	1027.87	1027.87	991.78	1057.87	1026.05	1015.62
Minor Works Authorization to Ministry of Urban Development	13.32			10.20			8.01		
Total (considering Minor Works authorization)			348.79			1001.98			1023.63
% of Utilisation of Fund against allotment (RE/FE)			99.63%			97.48%			99.76%

* Till the FY 2016-17 Administrative Support Activity used to be a part of the Plan fund and used to be distributed among the different Plan Schemes as overhead expenditure. With the abolition of the distinction between Plan and Non-Plan fund by the Government, this fund has been shown separately from FY 2017-18 onwards.

\$ This fund used to be the Non-Plan fund till FY 2016-17.

Human Resources

6.32 The total sanctioned strength of GSI is 12,189 as on 28.02.2019, 6307 posts are occupied. The group wise sanctioned strength of personnel as on 28.02.2019 is given in **Table 6.3**.

Table 6.3
Statement Showing Sanctioned & Filled up Strength in GSI as on 28.02.2019

Class	Sanctioned Strength	Total No. of employees in position	SC	ST	OBC	No. of Women	PH	Total (SC, ST, OBC Women, PH)
Women, PH)								
GROUP-A	3,900	2,581	439	190	721	698	23	2,071
GROUP-B	786	554	123	58	114	104	6	405
GROUP-B(NG) (Min.)	1,130	673	103	74	50	147	13	387
GROUP-B (NG) (Tech.)	1,524	409	89	48	36	36	4	213
GROUP-C (Min.)	925	528	110	50	92	95	7	354
GROUP-C (Tech.)	1,924	562	110	85	88	16	10	309
MTS (Erstwhile Gr. D)	2,000	1,000	264	126	160	163	33	746
Total	12,189	6,307	1,238	631	1261	1,259	96	4,485

6.33 Visibility Activity and Quality (VAQ)

a) The 100X100 VAQ [Visibility increase; Activity improvement; Quality enhancement] Model program [VAQ program] was initiated through a meeting in the ministry on 23.02.2018 chaired by Dr. K. Rajeswara Rao, Additional Secretary, M/o Mines with a selected initial group of 14 officers of GSI wherein diverse issues of GSI were discussed. Critical issues were identified which required to be addressed to have significant impact on functioning of GSI. This group would be given a task of firming up various Themes under VAQ program within a duration of 100 days or maximum up to year which would result in actionable

point for significant enhancement in the VAQ parameters of GSI.

b) Fourteen themes were identified and Theme-based groups were constituted, accommodating 125 high performing officers of GSI, to finalise



Two Days Workshop on Program 100X100 VAQ held on 19th and 20th July, 2018 at GSI, Kolkata

Theme based documents identifying the weak areas as well as outlining the steps needed for enhancing the parameters under this Program.

- c) Theme Coordinators in consultation with other officers have prepared documents outlining the weak areas, enhancement of key indices of performance with the vision to enhance the visibility, increase activity and enrich the quality of work in GSI.
- d) Ministry of Mines in July'18 organised a two-day workshop at GSI Kolkata to finalise key performance indices



Theme coordinators interacting during VAQ workshop held on 19th and 20th July, 2018 at GSI, Kolkata

and bottlenecks coming in the way of delivery parameters of GSI, especially in terms of VAQ model. As an outcome of the workshop, a comprehensive and implementable Program was finalised and implemented on 14th August 2018 which will have significant impact in increasing visibility, enriching the activities and enhancing quality of work in GSI.

- e) VAQ activities addressed Policy changes, Enhancement of exploration activities, streamlining processes of collaboration, procurement of modern equipment and software to escalate

the productivity and quality of results, creation of interactive platforms for knowledge sharing with other Government agencies, Academia etc.

- f) On the policy front, fresh insights have been added into “Roles & Responsibilities of all Cadres”, “Human Resource Deployment Policy”, “Policy on improvement of skill-set”, “Policy of awarding Merit-Demerit Points” etc.
- g) Thrust on exploration activities in Greenfield and brownfield areas was a significant theme and GSI has almost doubled its exploration activities in terms of implementing number of projects during FS 2019-20. Significant changes have been brought in technical operation through establishment of new Divisions, and implementing projects on Environmental geology, Smart City etc. during FS 2019-20.
- h) Procurement of new state-of-the-art scientific instruments for field and laboratory activities are in progress. Similarly, to address the issues of drilling, a crucial component of exploration, new drill rigs with higher capacity are in various stages of procurement.



Dust Suppression system at Mine face

- i) In the area of enhancement of collaboration, GSI has entered into MoU with IIT-ISM for the Ph.D. program; 9 officers from GSI have been selected for Ph.D. session commencing from June'19. Similar MoUs have been signed with Banaras Hindu University and Gauhati University. Policy formulation for GSI Internship program for postgraduate students of earth Sciences is at advanced stage.
- j) Another important theme of VAQ was dedicated on "Enhancing Visibility of GSI". Under this banner, Public Relation and media cells have been opened in each GSI office. Coffee table books, new data compilations for smart city projects, digital atlases (Mineral Atlas of India), Mineral Belt Maps, Bulletins, etc. have come up/are coming up. Highlights of GSI activities

Mawmluh Caves in Meghalaya, Varkala Cliff in Kerala, Gurudongmar Lake, Chhangu Lake, Stromatolite Geopark in Sikkim.

- l) GSI website has been revamped to put focus on products, services and activities and home page has been redesigned to put more machine readable content to effect more visibility.

Indian Bureau of Mines (IBM)

6.34 The Indian Bureau of Mines (IBM) is a subordinate office under the Ministry of Mines. It is engaged in the promotion of scientific development of mineral resources of the country, conservation of minerals, protection of environment in mines, other than coal, petroleum and natural gas, atomic minerals and minor minerals. It performs regulatory functions with respect to the relevant provisions of Mines and Minerals (Development and Regulation) Act, 1957 and enforcement of the rules framed there under, namely Mineral Conservation and Development Rules, 1988/2017 and Mineral Concession Rules, 1960/ 2016 and Environmental (Protection) Act, 1986 and Rules made there under.

6.35 It undertakes scientific, techno-economic, research oriented studies in



Well maintained Haul Raods in mines

and achievements are being shared with media through press releases, press conferences, social network postings, etc.

- k) Measures are being taken to declare new Geo-tourism sites such as



Reclaimed Area in mined out pit in a Limestone Mine

various aspects of mining, geological studies, ore beneficiation and environmental studies.

Organizational set up of IBM

6.36 IBM has its headquarters at Nagpur, 4 Zonal Offices at Bengaluru, Nagpur, Udaipur and Kolkata, and 13 Regional Offices at Ajmer, Bengaluru, Bhubaneswar, Chennai, Gandhinagar, Goa, Dehradun, Guwahati, Hyderabad, Jabalpur, Nagpur, Ranchi and Raipur. During the year 2017, IBM opened two new skill development centres for sustainable mining practices at Udaipur and Kolkata.

6.37 IBM has well-equipped ore dressing laboratories and pilot plants at Ajmer, Bengaluru and Nagpur.

6.38 Present Charter of Functions

(i) Collect, collate and organize into a database, all information on exploration, prospecting, mines and minerals in the country in the shape of a National Mineral Information Repository and take steps to publish and disseminate the same;



Water sprinkling on haul roads

- (ii) Function as the National Technical Regulator in respect of the mining sector, and lay down regulations, procedures and systems to guide the State Governments (first tier of regulation);
- (iii) Build up capacity in the system, both for regulatory as well as the developmental work, at the central level as well as at the level of the States;
- (iv) Establish institutional mechanisms of coordination between the centre, the States, mineral industry, research and academic institutions and all stake holders, so as to proactively develop solutions to the demands and problems faced by the industry;
- (v) Promote research on all aspects of practical relevance to the Industry and to act as bridge between research institutions on the one hand and user industry on the other;
- (vi) Provide Technical Consultancy Services;
- (vii) Participate in International collaborative projects in the area of regulation and development of the mineral sector;
- (viii) Advise Government on all matters relating to the mineral industry; and
- (ix) Undertake any such other activity as has become necessary in the light of developments in the field of geology, mining, mineral beneficiation and the environment.

6.39 Key Activities and Functions

In light of the role and charter of IBM, the key functions being performed by IBM



Cement Plant

can be broadly classified as (1) Regulatory Functions, and (2) Developmental Functions.

6.40 Regulatory Functions

- i. Mining Plan & Scheme of Mining - Inspections and Approval (Rule 13 to 17 of Chapter V of M (OAHCEM) CR 2016; Rule 9, 10, 11 & 12 of MCDR 1988);
- ii. Mining Regulations for ensuring implementations of Mining Plan, Scheme of Mining, Mine Closure Plan and other statutory provisions of MCDR 1988 and launching of prosecutions (Section 22 & 24 of MMDR Act 1957);
- iii. Inspections and grant of permissions to carry out 'stopping' operations in underground mines (Rule 26 of MCDR1988/ Rule 30 of MCDR 2017);
- iv. Monitoring of Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) aspects of mining operations (Rule 13 and 31 to 41 of MCDR 1988/ Rule 35 to 44 of MCDR 2017 and Section 10 of EP Act 1986);
- v. Calculations of State-wise, mineral-wise and month-wise royalty on ad valorem basis (Rule 64D of MCR 1960/ Rule 38 to 47 of M(OHEM) CR Rules, 2016 and Rule 45 of MCDR 1988/ 2017);
- vi. Mine Closure Plan - Inspections, Approval and monitoring (Rule 23A to 23F of MCDR 1988/ Rule 22 to 27 of MCDR 2017);
- vii. Co-ordination with State Governments for curbing illegal mining activities (intimation of violation of Section 4(1) of MMDR Act 1957 to State Government agencies).
- viii. As prescribed under Section 9(C) of the Act, IBM will discharge a proactive role in NMET by furnishing advise on mineral-wise conservation strategies, exploration gaps etc. keeping in view the national interest.
- ix. IBM administer the framework for sustainable development of the mining sector, as prescribed under section 20A (2) of the Act.
- x. IBM will continue to publish the Average Sale Price of all the major minerals through its MMS division. This information is required as per the rule 8 of Mineral (Auction) Rules, 2015 for calculating the "Value of

- estimated Resources” and “Value of the Mineral Dispatched” and that of ‘Reserve Price’ of the deposit to be put to auction
- xi. Grant of mineral concessions and monitoring of its activities in the offshore areas [various provisions of Offshore Areas Mineral (Development and Regulation) Act 2002 and the Offshore Areas Mineral Concession Rules, 2006].
- statistical data in respect of all major minerals through statutory and non-statutory basis;
- (v) Publications on topical interest – To assort process and analyze mines and mineral information generated on account of statutorily and non-statutorily collected information and supply them as important inputs for policy interventions, and
- (vi) Training and Capacity Building – To provide training facilities for human resource development and to develop required technical expertise and skill in the personnel manning the mineral industry.

6.41 Developmental Functions

- (i) R&D in Mineral Processing - To play a role of a catalytic agency to promote & develop the much-needed R&D in mineral processing in the field of mineral beneficiation, mineral characterization, chemical analysis of ores and minerals and analysis of environmental samples;
- (ii) Information Support and Advisory Services- To function as an advisory body to the government in formulation of mineral policy, lending technical guidance & support for framing Mineral Acts and in articulating provisions, rules & regulations thereof and lend it the credentials to formulate strategies, articulate policy requirements and oversee their implementation at both national and State levels;
- (iii) National Mineral Inventory – Periodical Updation of National Mineral Inventory reflecting the micro-level status and possession of various mineral resources of the country as per the international standards like UNFC;
- (iv) Repository on Mines & Minerals – To shoulder the responsibility for collection, processing and storage of

6.42 Performance of IBM

The activities of IBM have been conducted through the following continuing schemes:

Scheme No. 1. Inspection of mines for scientific and systematic mining, mineral conservation and mine environment;

Scheme No. 2. Mineral beneficiation studies, utilization of low-grade and sub-grade ores and analysis of environmental samples;

Scheme No. 3. Technological upgradation and modernization, and

Scheme No. 4. Collection, processing, dissemination of data on mines and minerals through various publications

Scheme No. 5. Mining Tenements System (under implementation)

6.43 These schemes are being implemented by the following divisions of IBM:

- i. Minerals Development & Regulation Division (MDRD) erstwhile Mines

- Control & Conservation of Minerals Division (MCCM);
- ii. Mineral Processing Division (MPD) erstwhile Ore Dressing Division (OD);
- iii. Technical Consultancy, Mining Research and Publication Division;
- iv. Mineral Economics Division;
- v. Mining and Mineral Statistics Division and
- vi. Planning and Coordination Division.

Performance relating to various activities of IBM during the year 2018-19 (up to March, 2019) is given hereinafter.

Inspection of Mines

6.44 During the year 2018-19 (up to March, 2019), 1168 inspections for enforcement of the provisions of Mineral Conservation and Development Rules

(MCDR) 2017 and for examination of mining plans/ review of mining plan / mine closure plans were carried out. Consequent to inspection of mines, 2255 violations were pointed out as against 1537 violations in 2017-18 in respect of 995 mines. Total 1163 violations were rectified during the year. So far, for the reporting period, 5 cases (including cases launched in previous years also) were decided in favour of IBM as against 5 in 2017-18. Mining operations were suspended under Rule 11(2) of MCDR 2017 in 292 mines for not carrying out mining operations in accordance with the approved mining plan/ review of mining plan and recommended 86 cases for suspension of leases to State Government for non-submission of online returns/ discrepancies in submitted returns. Also, 77 cases were recommended to State Government for termination of lease under Rule 12(10) of MCR, 2016. A list of principal violations observed during inspection of mines for the year 2017-18 and 2018-19 is given at **Table 6.4**.

**Table 6.4
Principal Violations of MCDR, 2017 detected by IBM during 2017-18 and 2018-19 (up to March, 2019)**

Rule No	No. of Violations Pointed out 2017-18	No. of Violations Pointed out 2018-19 (up to March, 2019)	Rule description
11(1)	307	423	Rule 11 (1) - Mining operations in accordance with mining plans
11(3)	17	10	Rule 11 (3) - Submission of Review of Mining Plan / Scheme of mining
20	6	4	Rule 20 - Notice of opening of mine
23	0	0	Rule 23 - Submission of progressive mine closure plan
26 (2)	235	190	Rule 26 (2) - Responsibility of the holder of mining lease to submit yearly report
27(2))	169	151	Rule 27(2) - Submission of Financial assurance
28(1)	62	37	Rule 28 (1) - Notice of temporary discontinuance of mining operations

Rule No	No. of Violations Pointed out 2017-18	No. of Violations Pointed out 2018-19 (up to March, 2019)	Rule description
31(4)	61	51	Rule 31(4) - Maintenance of plans and sections
33	79	52	Rule 33 - Copies of plans and sections to be submitted
35,36,37, 38, 39,40,41, 42,43,44	94	20	Protection of environment : Rule 35, 36, 37, 38, 39, 40, 41, 42, 43, 44 - Sustainable mining, removal and utilization of top soil, Storage of overburden, waste rock Precaution against ground vibrations, Control of surface subsidence, Precaution against air pollution, Discharge of toxic liquid, Precaution against noise, Permissible limits and standards, Restoration of flora respectively.
45(5)(b)	62	151	Rule 45 (5) (b) - Submission of Monthly Return
45(5)(c)	87	164	Rule 45 (5)(c) - Submission of Annual Return
55(1)(c)(i)	72	62	Rule 55(1)(c)(i) - Employment of Whole time Mining Engineer/ Geologist
55(1)(c)(ii)	47	21	Rule 55(1)(c)(ii) - Employment of Part time Mining Engineer/ Geologist
Others	239	695	
Total	1,537	2,255	

6.45 Inspection of Mines carried out by IBM during 2018-19 (up to March, 2019)

S No	State	No. of inspection
1	Andhra Pradesh	94
2	Assam	07
3	Bihar	01
4	Chhattisgarh	87
5	Goa	16
6	Gujarat	141
7	Himachal Pradesh	27
8	Jharkhand	63
9	Karnataka	146
10	Kerala	7
11	Madhya Pradesh	145
12	Maharashtra	73
13	Manipur	1

14	Meghalaya	22
15	Odisha	118
16	Rajasthan	83
17	Tamil Nadu	99
18	Telangana	33
19	Uttaranchal	03
20	Uttar Pradesh	02
	Total	1168

Mining Plan, Review of Mining and Mine Closure Plan

6.46 The Mineral (Other than Atomic and Hydro Carbons Energy Minerals) Concession Rules, 2016 and the Mineral Conservation and Development Rules, 2017 stipulate that mining operations are required to be conducted as per an approved Mining Plan and after extraction of minerals, the mines are required to be

reclaimed as per an approved Mine Closure Plan. The Mining Plans are approved by the IBM and in case of mines of minor minerals including 31 notified (on 10.02.2015) non-metallic or industrial minerals; the powers have been delegated to respective State Governments. The Mine Closure Plan is required to comprise a Progressive Mine Closure Plan (PMCP) prepared for five yearly periods of the successive mining schemes and a Final Mine Closure Plan (FMCP). Mine Closure Plan is expected to address issues relating to environment protection including air, water and land protection, management of top soil and overburden, reclamation and rehabilitation of land and control on ground vibration, surface subsidence and restoration of flora.

6.47 As on March 2019, Financial Bank Guarantees for a value of ₹18,38,94,63,062/- i.e. 18389.46 Million Rupees (As per revised per hectare rate of Rule 27(1) of MCDR, 2017) have been



Water Sprinkling on Roads

collected and certificates under Rule 29A of MCR 1960 / 21(4) of MCDR, 2017 have been issued for 05 cases (excluding 31 minor minerals) of partial or full surrender of lease.

6.48 During the year 2018-19 (Up to March, 2019), 21 Mining Plans were approved and 07 not approved, 210 Review of Mining Plan were approved and 76 not approved and 76 Final Mine Closure Plans approved and 18 were not approved. State-wise break-up is given at **Table 6.5**.

Table 6.5
State-wise Mining Plans/Review of Mining Plans / Schemes of Mining/Final Mine Closure Plans approved by IBM during 2018-19 (up to March 2019)

S. No	State	Mining Plans		Review of Mining Plan		FMCP	
		Approved	Not Approved	Approved	Not Approved	Approved	Not Approved
1	Assam	0	0	0	1	0	0
2	AP	0	3	23	11	0	0
3	Jharkhand	3	1	20	2	6	5
4	Bihar	0	0	1	0	0	0
5	Chhattisgarh	5	2	21	4	3	1
6	Goa	0	0	1	0	0	0
7	Gujarat	2	0	59	7	11	2
8	Himachal	0	0	3	1	0	0
9	J & K	0	0	2	1	0	0

S. No	State	Mining Plans		Review of Mining Plan		FMCP	
		Approved	Not Approved	Approved	Not Approved	Approved	Not Approved
10	Karnataka	0	0	12	1	15	0
11	Kerala	0	0	0	1	1	0
12	MP	4	0	31	17	0	0
13	Maharashtra	2	0	6	5	2	3
14	Meghalaya	1	0	1	1	1	0
15	Odisha	1	1	17	11	34	2
16	Rajasthan	3	0	0	0	1	1
17	Tamilnadu	0	0	11	12	2	4
18	Telangana	0	0	2	1	0	0
19	Total	21	07	210	76	76	18

6.49 IBM monitors the progress of reconnaissance permits and prospecting licences, the details of which are given at **Table 6.6** and **Table 6.7**, respectively.

Table 6.6
Status of Reconnaissance Permits in India as on March, 2019.

S. No	State	Total No. of RPs granted upto March 2019	No. of RPs where final exploration data submitted to IBM
1	Andhra Pradesh	56	44
2	Arunachal Pradesh	01	00
3	Chhattisgarh	42	26
4	Gujarat	04	00
5	Jharkhand	04	02
6	Karnataka	66	29
7	Kerala	01	00
8	Madhya Pradesh	91	29
9	Maharashtra	10	08
10	Manipur	01	00
11	Odisha	26	19
12	Rajasthan	74	29
13	Uttar Pradesh	21	08
14	West Bengal	04	01
	Total	401	195

Table 6.7
Status of Prospecting Licences (major & minor) in India as on March, 2019*

S. No	State	Total No. of PLs granted by the State Government as on 31.03.2019	No. of PLs where final exploration data submitted to IBM*
1	Andhra Pradesh	93	37
2	Arunachal Pradesh	17	01
3	Chhattisgarh	152	84
4	Gujarat	18	01
5	Himachal Pradesh	07	04
6	Jharkhand	28	05
7	J & K	01	00
8	Karnataka	10	06
9	Kerala	01	00
10	Madhya Pradesh	563	157
11	Maharashtra	48	09
12	Manipur	16	01
13	Meghalaya	15	04
14	Odisha	16	06
15	Rajasthan	234	12
16	Tamil Nadu	18	00
17	Telangana	44	11
18	Uttarakhand	44	00
19	Uttar Pradesh	03	00
20	West Bengal	03	00
	Total	1,327	335

*To the extent grant orders, reports received at IBM Nagpur.

Preparation of Mineral Maps

6.50 A Remote sensing centre has been set up at IBM in 2018. Multi Mineral Lease hold maps are now updated on Arc GIS platform. During 2018-19 up to March, 2019, geo referencing and projection of 539 top sheets in ARC GIS covering Goa, Andhra Pradesh, Kerala, Rajasthan, Madhya Pradesh, Gujarat, Chattisgarh, Telangana Tamil Nadu, Odisha, Jharkhand, Maharashtra, Karnataka, Bihar, Haryana, Himachal Pradesh, Jammu & Kashmir States is completed. Vectorisation of 112 toposheets and plotting of 929 mining leases completed.

Mineral Beneficiation

6.51 Mineral beneficiation studies including mineralogical testing and chemical analysis intimately related to both conservation and development of mineral resources. During the year 2018-19 (up to march 2019), 50 ore dressing investigations, 33,644 chemical analyses, 2,751 mineralogical examinations and 02 in-plant study were completed. Ore Dressing officers are also associating with officers of MDRD division in carrying out Regional mineral Development Studies (RMDS).

National Mineral Inventory (NMI)

6.55 Synthesis of NMI as 01.04.2015 of freehold, leasehold Public & Private sector deposits in respect of 71 minerals as per UNFC was completed.

6.53 Identified various gaps/deficiencies in National Mineral Inventory as on 01.04.2015 of all deposits in respect of free hold and lease hold (public/private) of 46 major minerals with respect of upcoming Mining Tenement System (MTS).

6.54 Mineral wise chapter of 71 minerals including 25 minor minerals for the publication "National Mineral Inventory- an Overview as on 1.4.2015" was completed and uploaded on IBM website. "National Mineral Overview as on 01.04.2015" were prepared and released in the month of April 2018.

6.55 The NMI is based on UNFC system which is being used for making various decisions in the mining and exploration sectors by the domestic/foreign investors. Such a system has wide ramifications of use in different kinds of decision making and policy formulation concerning not only minerals but allied fields as well.

Statistical Publications

6.56 IBM disseminates statistical information on mines, minerals, metals and mineral-based industries through various publications. Information on mineral production, stocks, dispatches, employment, inputs in mining, mining machinery and related matters received from the mine owners on statutory basis under the MCDR, 1988 and ancillary statistics on metals production, mineral trade and market prices of minerals, revenue from the mining sector, rent, royalty and cess on minerals, etc from other agencies is compiled regularly by IBM.

6.57 The statistical publications released during the year 2018-19 (up to March 2019) include Statistical profiles of minerals 2016-17 and 04 issues of Monthly Statistics of Mineral Production (MSMP). Further, Indian Mineral Industry at a Glance 2015-16 issue completed and hoisted on website, Issue of 2016-17 under progress. MSMP issues of August 2018 is under progress.

Consultancy Service

6.58 IBM provides technical consultancy services on prescribed charges for geological appraisals, survey of the areas, preparation of feasibility study reports, environment impact assessment and environment management plan, selection of suitable mining equipment, evaluation of feasibility report prepared by other consultants, financial institutions, etc.

Technical Publications

6.59 IBM brings out technical publications relating to mines and minerals, mineral-based industries, trade, beneficiation, R&D activities, etc. During the year 2018-19, (up to March 2019) IMYB 2017 three volumes are released and IMYB 2018 (advance release) three volumes uploaded on IBM website. Half-yearly Bulletins on Mineral Information (October'17-March '18 and April 2018 to September 2018 issue) and Bulletin on ML/ PL/RP-2016 are released.



Underground mines of KCC

Training

6.60 IBM imparts training to technical and non-technical officials of IBM and also to persons from the mineral industry and other agencies in India and abroad. During the year 2018-19 up to March 2019, 16 training programmes were conducted

in which a total of 198 IBM personnel, 395 industry personnel and 78 State DGM personnel participated. During the year 2017-18, 15 training programmes were conducted in which a total of 393 IBM personnel, 88 industry personnel, 09 officers of Directorate and Geology participated.

Measures for Abatement of Pollution and Environmental Protection

6.61 The IBM undertakes inspections/ studies for the enforcement of provisions of MCDR, 2017 which include provision on protection of mine environment to ensure that due care is being taken by the mine operators. During inspection it ensures that mine operators are taking due care for preservation and utilization of top soil, storage of overburden / waste rocks, reclamation and rehabilitation of land, precaution against ground vibration, control of ground subsidence, abatement measures against air, water- and noise pollution, restoration of flora, etc. in addition to other conservation and developmental measures. Necessary guidance to mine managements/ operators are also given for systematic and scientific development of mine including protection of environment. While approving the mining plans, schemes of mining and mine closure plans, IBM ensures that environment impact assessment studies have been carried out and to that effect environmental management plan has been incorporated for its effective implementation, besides reclamation and rehabilitation of mined-out areas.

6.62 As a result of follow up for implementation of EMP, extensive afforestation has been undertaken in the

mines by the mine owners. So far, 118.25 million saplings have been planted over an area of about 59,460 hectares with a survival rate of 68.61 percent.

6.63 Similarly, work of simultaneous reclamation/ rehabilitation is also undertaken by the mine owners for abandoned mines. So far, 111 abandoned mines covering an area of 1366 hectares have been reclaimed / rehabilitated.

Revenue Generation

6.64 IBM generates revenue through consultancy, training, statutory processing and sale of publications & data etc. Revenue generated during 2018-19 (up to March 2019) is ₹196.96 Lakh comprising ₹25.97 Lakh from mineral processing assignments; ₹414.12 Lakh from processing of mining plans/schemes of mining and compounding fees & fines; and balance ₹1.35 Lakh from sale of publications, mineral maps, mineral inventory data etc.

Computerization

6.65 The Regional (Except Raipur & Gandhinagar RO) /Zonal offices and Headquarters of IBM have been linked through a sophisticated system based on client server architecture established with the help of BRGM, France. Proposal for connecting Raipur & Gandhinagar RO with said system along with VC facility is under process. IBM has well established LAN facility, besides WAN system to communicate and exchange data with Regional, Zonal offices and Headquarter offices. In all RO/ZO offices, VC facility is operational.

6.66 The Web Portal of IBM i.e. www.ibm.gov.in provides information on IBM's history, functions, organization, divisions of IBM and its activities, jurisdiction of

regional & zonal offices, services offered by IBM. The new domain ibmreturns.ibm.gov.in is also functional for facilitating the stakeholders to submit the Monthly & Annual Return online and also scrutiny of the same by IBM. Further, the Bilingual Website of IBM is being updated as and when required.

6.67 After introduction of online submission of returns system consequent upon amendment to Rule 45 of MCDR, 1988 vide notification No. 75(E), dated 9th February, 2011, the mine owners have commenced submission of monthly and annual returns online. IBM is monitoring and guiding/ encouraging the mine owners and their representatives for online submission of returns. The month-wise monthly returns submitted online are given in **Table - 6.8**.

Table 6.8
Month-wise Returns Submitted online (up to February 2019)

SI No.	Month	No. of monthly returns received online
1	April, 2018	2,293
2	May, 2018	2,291
3	June, 2018	2,287
4	July, 2018	2,278
5	August, 2018	2,268
6	September, 2018	2,254
7	October, 2018	2,256
8	November, 2018	2,229
9	December, 2018	2,202
10	January, 2019	2,138
11	February, 2019	2,033

6.68 The status of mining leases and mines in India in respect of scheduled minerals is given in **Annexure 6.2 (Page No. 197)**.

Mining Tenement System (MTS)

6.69 MTS has been taken up by IBM during the programme year 2009 - 10. The objective of the Scheme is to develop an online National Mineral Information System for investors by linking Central and State organizations engaged in administration of mineral resources in the country. The mining tenement system would have graphical information database (GIS) as well as information in textual form. These two databases, i.e., non-spatial database and spatial database would be seamlessly integrated so as to retrieve graphical information as well as relevant textual information. The system will be thus web enabled and access to the system will be given online to prospective investors, government organizations, private and public organizations through Internet as per policy of the Government.

6.70 As approved by Core committee on MTS, the successful bidder M/s WIPRO has signed the contract with IBM on 10.11.2016 in the august presence of Secretary (Mines) at Nagpur. M/s NISG, Hyderabad signed agreement as Project Management Unit(PMU) on 04.05.2017. Core Committee approved the Project Plan, SRS Document of Phase-I and COTs Software along with release of linked payments as per RFP. Pradhan Mantri Khanij Kshetra Kalyan Yojna (PMKKKY), a part of MTS and as a change request was approved by Core Committee on 26.10.2017. For procurement of Cloud Services, the Co-ordination Committee has approved the name of M/s ESDS and accordingly, an agreement with M/s ESDS

was signed on 23.11.2017 at Nagpur. The SRS Document of Pradhan Mantri Khanij Kshetra Kalyan Yojna (PMKKKY) along with System Design Document (SDD) for Phase-1 was approved on 30.01.2018 by Core Committee. Three modules of MTS Project viz. PMKKKY, Registration and Daily Returns were launched by Honorable Minister of Mines Shri Narendra Singh Tomar on 20.03.2018 during 3rd National Conclave on Mines & Minerals at New Delhi. PMKKKY is currently live w.e.f. 27.08.2018 for data entry at district level and most of the States have started entering data on DMF collection and projects sanctioned for utilization of fund in high and other priority heads in the affected areas due to mining. The Registration module is available on <http://mitra.ibm.gov.in> and applicants engaged in mining are updating the details since 15th Feb 2019. Similarly Daily Return Forms D1, D2 and D3 and Monthly Return Forms F1, F2 and F3 forms are available on <http://mitra.ibm.gov.in> to view and submit the returns. Other modules of MTS are at various stages i.e. at staging environment, discussion and finalization etc.

Sustainable Development Framework (SDF)

6.71 Star Rating System: A good governance initiative is designed as a tool for evaluation of the performance of lease operators on the various parameters encompassed by the Principals of the Sustainable Development Framework (SDF) approved by Ministry of Mines in 2011 in line with the National Mineral Policy 2008. Thus it can be viewed as a mapping of mining footprints from the view point of Sustainability.

- The system has been developed primarily on the basis of self-



Continuous Cast Copper Wirerod at Taloja Copper Plant

assessment followed by validation by Indian Bureau of Mines along-with provisions for third party auditing as may be considered fit by Ministry of Mines.

- The Star rating has been mandated by rule 35 of newly notified MCDR 2017.

6.72 All the mine operators are mandated to achieve four or five star ratings within a stipulated time period of two years from the date of commencement of mining operations or the date of notification of the rules (i.e. March 2017) whichever is later in accordance with rule 35 of MCDR 2017. Failing which Mining operations are liable to be suspended.

- A system of third party auditing of the award of rating system and the process implementation is also proposed.

6.73 Following are the anticipated outcomes of the Star rating system:

- Reduced environmental and social conflicts in areas awarded for mining.
- Greater clarity for all concerned stakeholders, on risk levels of mining lease areas.
- Potentially reduced delays in obtaining

clearances environmental, forest for mines.

- Improved protection of high risk areas in terms of environment and social considerations.
- A Regional Mineral Development Plan for selected mining areas and addressing key regional and cumulative impacts of mining through coordinated and collective action.
- Opportunity for clustering of small operators to become more competitive, and compliant.
- A robust E&S Management framework in mining companies.
- A disclosure process that provides stakeholders with relevant and timely information, and allows issues to be raised in engagement forums.
- Enhanced control on illegal mining activities through intensive stakeholder scrutiny by publishing details on mining activity in public domain.

6.74 The year wise 5 Star Rated mines are given below.

Year	5 Star Rating
2014-15	10
2015-16	32
2016-17	57

6.75 The mine operators were felicitated for achieving 5 star rating at National Conclave on Mines and Minerals held at Raipur, Delhi and Delhi for the said years on 4-5 July, 2016, 15th February, 2017 and 20th March, 2018 respectively.

6.76 During the year 2018-19, (up to March 2019)so far, 994 online templates for the performance of year 2017-18 have been filed by the lessees. Field verification of these leases for final evaluation is under progress and so far in 489 leases field verification has been completed.

Mining Surveillance System (MSS)

6.77 Mining Surveillance System (MSS) is a satellite-based monitoring system which aims to establish a regime of responsive mineral administration by curbing instances of illegal mining activity through automatic remote sensing detection technology.

- Ministry of Mines & Indian Bureau of Mines (IBM) have developed the MSS, with assistance from Bhaskaracharya Institute for space applications and Geo-informatics (BISAG), Gandhinagar and Ministry of Electronics and Information Technology (MEITY).
- The system works on the basic premise that most minerals occur in the continuity and their occurrence is not limited to the lease area but is likely to extend in the vicinity. The MSS checks a region of 500 meters around the existing mining lease boundary to search for any unusual activity which is likely to be illegal mining. Any discrepancy is found is flagged-off as a trigger.
- The MSS is a transparent & bias-free system, having a quicker response time and capability of effective follow-up. The deterrence effect of 'Eyes watching from the Sky' would be extremely fruitful in curbing instances of illegal mining.
- A user friendly mobile app for MSS

has been created and launched on 24th January, 2017 at Gandhinagar for enabling public participation in assisting the governments endeavor to curb illegal mining, which was being used by the inspecting officials to submit compliance reports of their inspections.

- In the initial phase, a total of 296 triggers across the country covering a total area of 3994.87 hectares wherein, 47 unauthorized mining have been detected after inspection of the triggers by the state government officials.
- The training of all the States for its adoption of the MSS for minor minerals has also been done.
- In the second phase, 52 major mineral triggers, have been detected from the 3280 plotted leases (Working Mines 1689 plotted out of 1694 and Non-Working Mines 1596 plotted out of 2129) across the country, out of which 38 have been verified by the State Governments and in 4 cases unauthorized mining activities have been identified.
- Similarly, in respect of minor minerals, so far, 130 triggers have been generated, out of which 78 have been verified and in 8 cases unauthorized mining activities have been identified.

Threshold Values of Minerals

6.78 Threshold value of minerals notified vide Notification No. C-284/3/CMG/2017 Dated 25.04.2018.

- (i) Indian Bureau of Mines is vested with the responsibility to review the threshold value of minerals periodically

under sub rule 7 of rule 12 of Mineral Conservation and Development Rules, 2017.

- (ii) IBM, through notice published in the website of IBM on 24.3.2017, had invited comments and suggestions from the stakeholders and general public with regard to revision of the threshold value of minerals notified previously on 16th October 2009. In response to the notice many suggestions and comments were received from the stake holders.
- (iii) IBM also conducted five Regional Level technical workshops and a National Level workshop to discuss various issues and concerns raised by the stake holders with regard to the revision of

the threshold value of minerals.

- (iv) After careful examination of the suggestions and comments of the stakeholders through an expert committee constituted for the purpose and based on the recommendations of the committee, the threshold value of following minerals are hereby notified under sub rule 6 of rule 12 of Mineral Conservation and Development Rules 2017. This notification supersedes the notification issued earlier vide file No.T-45031/CGBM/2007 (PF) dated 16th October 2009.
- (v) This notification shall be effective from the date of its notification in the gazette of India.



DG Snout in Schirmacher Oasis Antarctica



Mineral Conservation through in Pit Crushing





Central Public Sector Undertakings

Central Public Sector Undertakings

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- Bharat Gold Mines Limited (BGML) Page - 114
- Hindustan Zinc Limited (HZL) Page - 114

National Aluminium Company Limited (NALCO)

Introduction

7.1 National Aluminium Company Limited (NALCO) is a Navratna CPSE under Ministry of Mines. It was established on 7th January, 1981 in the Public Sector, with its registered office at Bhubaneswar. The Company is an integrated and diversified mining, metal and power group 'A' CPSE with net sales turnover of ₹ 9,376 crore in financial year 2017-18, export sales (i.e. ₹ 4,075 crore) accounted about 43% of turnover and business in more than 15 countries. The Company is 3rd highest net foreign exchange earning CPSE in the year 2017-18. Presently, Government of India holds 52% equity of NALCO.

7.2 With its consistent track record in capacity utilization, technology absorption, quality assurance, export performance and posting profits, NALCO is an iconic example of India's industrial might.

7.3 The Company retained its No. 1 position as the lowest cost producer of alumina in the world in last 4 years as per Wood Mackenzie report. Adding further flavour, Panchpatmali Bauxite Mines has emerged as the lowest cost producer of Bauxite in the world in 2018.

7.4 NALCO is the first Public Sector Company in the Country to venture into international metal market in a big way with London Metal Exchange (LME) registration since May, 1989. The Company is listed at Bombay Stock Exchange (BSE) since 1992 and at National Stock Exchange (NSE) since 1999. Besides, ISO 9001, ISO 14001,

7.5 The Company has diversified to renewable energy sector by commissioning 198 MW wind power plant in four different



NALCO Corporate Office, Bhubaneswar

places in AP, Rajasthan and Maharashtra to reduce carbon foot print. Moving ahead, the Company has also utilised the entire available rooftop space in Corporate Office, Township and NRTC at Bhubaneswar for setting up of 310 kWp solar power plant.

Existing Operations & their Locations

Bauxite Mines

7.6 The Company has its bauxite mines situated on Panchpatmali plateau in Damanjodi, Koraput, in the State of Odisha. Panchpatmali Bauxite mine is being presently operated over two bauxite mining leases, placed adjacent to one another with a common boundary. This bauxite deposit is mined by a fully mechanised system having a capacity of 6.825MTA. Panchpatmali plateau stands at an elevation of 1154 m to 1366 m above mean sea level. Bauxite occurs over the full length of the Panchpatmali plateau, which spans over 18 km. The mined-out bauxite is transported from the mine to refinery by a 14.6-km-long single-flight multi-curve 1800 tonne-per-hour (TPH)- capacity cable belt conveyor.

Alumina Refinery

7.7 The alumina refinery is located at



Alumina Refinery, Damanjodi



Aluminium Smelter, Angul

Damanjodi, Odisha, approximately 14 km from the bauxite mine at Panchpatmali. The alumina produced is transported to aluminium smelter at Angul (Odisha) and to Vizag (Andhra Pradesh) port by rail with NALCO's captive wagons.

Operations

7.8 The present normative capacity of alumina refinery is 21 lakh TPA. Alumina produced is used to meet Company's requirements for production of primary aluminium at smelter. The surplus alumina that remains after internal consumption is sold in the export markets. A small portion is also sold in domestic market.

Aluminium Smelter

7.9 The aluminium smelter is located at Angul, Odisha, approximately 699 km from the refinery and 5 km away from the captive thermal power plant. The aluminium produced at the smelter is transported to Vizag port (548 km away), Kolkata Port (526 km away) and Paradeep port (183 km away) by rail for export. Aluminium in the forms of ingots, sow ingots, tee ingots, billets, wire rods, cast strips, alloy ingots, flat products and chequered sheets is also sold in the domestic market through its stockyards located across the country.

Operations

7.10 The aluminium smelter entered into production progressively from 1987. The present capacity of smelter is 4.60 lakh tonne per year. Alumina is converted into primary aluminium through a smelting process using electrolytic reduction. From the pot-line, the molten aluminium is routed to either the casting units, where the aluminium can be cast into ingots, sow ingots, tee ingots, billets, wire rods, cast strips and alloy ingots, or to holding furnaces at flat aluminium products unit where the molten aluminium is rolled into various cold-rolled products or cast into aluminium strips.

Captive Power Plant

7.11 The aluminium smelter and coal-based pit head captive power plant at Angul are strategically located. The Power Plant is located approximately 5 km away from aluminium smelter.

7.12 The location of captive thermal power plant at Angul is also strategic to the availability and supply of coal. NALCO sources its major coal requirement for captive thermal power plant from the Talcher coalfields of Mahanadi Coalfield Ltd. (a subsidiary of Coal India Ltd.), located approximately 15 km from Angul. The 18.5-km captive railway system links the



Captive Power Plant, Angul

captive thermal power plant to the Talcher coalfields, enabling transport of the critical and bulk requirement of coal.

Operations

7.13 The captive thermal power plant commenced operations in 1986. Presently the captive thermal power plant has a generation capacity of 1200 MW by way of 10 turbo-generators, each rated at 120 MW. While the captive thermal power plant provides entire electric power requirement of aluminium smelter, it also provides for approximately 35 MW of the power requirement to the alumina refinery through wheeling.



Wind Power Plant, Jaisalmer

Wind Power Plants

7.14 The 1st wind power plant of capacity 50.4 MW (2.1MW, 24 nos. WEGs) in Gandikota, Andhra Pradesh was commissioned in December 2012 and the 2nd wind power plant of capacity 47.6 MW

(0.85 MW, 56 nos. WEGs) at Ludarwasite, in Jaisalmer, Rajasthan was commissioned in Jan'2014. 3rd wind power plant of capacity 50 MW (2 MW, 25 nos. WEG) at Devikot site, Jaisalmer, Rajasthan and a 50.4 MW (2.1MW, 24 nos. WEGs) Wind Power Plant at Sangli, Maharashtra commissioned in FY 2016-17.



Rooftop Solar Panels

Rooftop Solar System

7.15 NALCO utilised the entire available roof top space in Corporate Office, Township and NRTC at Bhubaneswar for setting up of 310 kWp solar power plant.

Port Facilities

7.16 On the Northern Arm of the Inner Harbour of Visakhapatnam Port on the Bay of Bengal, NALCO has established mechanized storage and ship handling facilities for exporting Alumina in bulk and importing Caustic Soda.



Port Facilities

Performance of NALCO

7.17 Physical performance, financial performance and sales performance are presented at **Table 7.1**, **Table 7.2** and **Table 7.3**.

Table-7.1
Physical Performance of NALCO

Product	Unit	2015-16 Actual	2016-17 Actual	2017-18 Actual	2018-19 Target (Very Good)	2018-19 Actual
Bauxite	Lakh MT	63.40	68.25	70.25	68.30	72.31
Alumina Hydrate	Lakh MT	19.53	21.00	21.06	20.50	21.53
Aluminium Metal	Lakh MT	3.72	3.87	4.26	3.80	4.40
Net power	MU	5,841	6,066	6,547	5,935	6,256
Wind Power	MU	151	198	243	280	363

Table 7.2
Financial Performance of NALCO

(₹ in crore)

Sl. No.	Particulars	2015-16 Actual	2016-17 Actual	2017-18 Actual	2018-19 Target (Very Good)	2018-19 Actual	Estimated Total for 2018-19
1.	Income *	7,353	7,964	9,789	9,377	8,961	Shall be submitted after Annual Audit 2018-19
2.	Operating Cost **	5,825	6,516	7,268	8,253	6,267	
3.	Interest & Transaction Loss	1	3	2	3	2	
4.	Depreciation & Amortization	424	480	480	481	356	
5.	Profit before Income tax and Dividend	1,103	965	2,039	640	2,336	

* Income and expenditure are net of excise duty on sales.

** Operating cost includes exceptional items

Table 7.3
Sales Performance of NALCO

SALES	Unit	2015-16 Actual	2016-17 Actual	2017-18 Actual	2018-19 Target (Very Good)	2018-19 Actual
Total Alumina/ Hydrate Sale	Lakh MT	12.20	12.95	13.37	12.79	13.18
Aluminium Export	Lakh MT	0.94	1.01	0.76	0.67	0.39
Domestic Aluminium Sale	Lakh MT	2.78	2.85	3.50	3.13	4.02
Total Aluminium Sale	Lakh MT	3.72	3.86	4.26	3.80	4.41

Projects

7.18 The major activities during the year 2018-19 pertaining to various projects of NALCO is as under:

a) 5th Stream Refinery: All the statutory clearances obtained for brownfield expansion of 1 million tonne Refinery. The technology supplier and the EPCM consultant have already been engaged. Basic engineering package deliverables submitted by the technology provider and the tendering activities of major packages under process.

b) Development of south block of Panchpatmali Bauxite mines: EPCM consultant appointed and conveyor route & crusher house location firmed up. Conveyor technology & Packaging philosophy finalized. EC amendment granted by MoEF & CC. Preparation & finalisation of Technical Specification under progress.



Aluminium Billet

c) Development of Pottangi Mines: DGPS survey for revised mining lease area of 697.979 Ha completed and Mining Plan approved by IBM. Terms & condition for grant of ML over revised mining lease area of 697.979 Ha issued by GoO. ToR received for EC and Draft EIA/EMP report prepared. Compensatory afforestation land for Forest clearance allotted by GoO. Route survey of conveyor corridor

completed. Forest diversion proposal is under preparation by DFO, Nabarangpur.

d) Utkal D Coal Mines: Mining Lease Area Land registration executed & transfer of land completed. R&R Colony land mutated & physical possession taken by NALCO. Pre project activities are in progress and works related to issue of TOR for revised mining lease area, approval of Mining plan, grant of Environment Clearance & forest clearance under progress.

e) Utkal E Coal Mines: Compensation disbursement of private land and Land transfer activities (Govt. & Pvt.) is in progress. About 762.407 Ac registered out of total land of about 895 Ac. DGPS Survey is in progress. Schemes for Compensatory Afforestation have been prepared.

f) JV with GACL for setting up of 2.7 Lakhs caustic soda plant at Gujarat: Land for the project transferred in favour of GNAL and major packages of Caustic Soda Project & Captive Power Plant awarded. Environmental Clearance for the project obtained and site activities for land development, piling works etc. for CPP are in full swing. Civil works for caustic soda plant started. Financial closure of the JVC completed with signing of loan agreements with PNB and SBI. NALCO's contribution to equity is ₹ 159.53 crore till date.

g) Angul Aluminium Park in JV with IDCO: Land acquisition and boundary wall construction completed & Pricing mechanism of hot metal finalized. 100% land for permanent approach road acquired by IDCO for road development and work is continuing. Standard Operating Procedures (SOP) is being laid down for units to raise the requisition of molten metal to NALCO for which a joint technical committee formed. NALCO has



Aluminium wire rod (packed)

already committed to supply 50,000 MT of aluminium per year for a period of 20 years to the JV Company. Assessment of readiness of allotted entrepreneur is in progress.

h) Aluminium alloy manufacturing plant in JV with MIDHANI: NALCO signed an MOU with Mishra Dhatu Nigam Ltd. (MIDHANI) for establishment of Aluminium Alloy manufacturing plant in JV mode for meeting the requirement of Defence, Aerospace, Automobile and Transport sectors under the “Make in India” initiative of Government of India. Govt. of Andhra Pradesh has allotted 120 acres of land for the project and NITI Aayog given clearance for the project in March, 2019. Tentative financial closure plan worked out and is being finalized between both the organizations.



NALCO signs MoU with Ministry of Mines, Govt of India

i) Coal Tar distillation plant in JV with NINL: NALCO signed MoU with Neelachallspat Nigam Ltd. (NINL) for setting up a Coal Tar distillation plant in JV mode for production of Coal Tar Pitch. TEFR for the project prepared. Concurrence of NITI Aayog for formation of JV Company is awaited. Selection of technology and preparation of DPR is underway.

j) MoU with HCL and MECL: NALCO, HCL and MECL, the three CPSEs under the Ministry of Mines, Government of India have signed an MoU to set up a JV Company named **Khanij Bidesh India Limited (KABIL)** to identify, acquire, develop, process and make commercial use of strategic minerals in overseas locations for supply in India and boost “Make in India” initiative of Government of India. Proposal for formation of a JVC has been cleared by Ministry of Mines and NITI Aayog. NALCO Board has approved the proposed JV agreement. HCL and MECL are in the process of obtaining approvals from their respective Boards. Preparation of draft MoA&AoA is in progress.

k) Commercialization of Li-Ion cell technology: NALCO shortlisted by ISRO for transfer of Li-Ion cell technology. Memorandum of Agreement (MOA) signed with ISRO for technology transfer.

New Corporate Plan

7.19 New Corporate Plan of the Company has been developed as per the guidelines of NITI Aayog, envisaging progressive growth of the company over a period of 3 years, 7 years and 15 years with a changed vision. The Corporate Plan (2017-2032) of NALCO was rolled out by on 08.01.2018.

- The plan envisages Alumina Refining capacity of 3.27 million tons, Aluminium



Aluminium T-Ingot



KCC Underground Mines

Smelting capacity of 1.1 million tons, Turnover of ₹ 18,171 crore and PAT of ₹ 1,693 crore by 2024.

- The long term strategy foresees the company to reach Turnover of ₹ 31,248 crore and PAT of ₹ 3,010 crore by 2032.
- The new business initiative includes growth through expansion in core business, forward integration through value addition downstream facilities, selective diversification and backward integration for raw material securitization, based on an in-depth study of industries and economic outlook, opportunities arising out of emerging business scenario and Company's core capabilities.

I.T.

7.20 NALCO is leveraging Information Technology (IT) to augment the organization's quest for sustainable growth and continuous improvement in processes and business practices.

a. Enterprise Resource Planning (ERP) application has been implemented to integrate all the business functions such as Sales and Distribution, Finance & Controlling, Materials, Human Resource and Production Planning to ensure uniform process, to improve information availability, transparency and decision making. E-procurement of goods are

carried out through SAP SRM and Central Public Procurement Portal. Centralized Non-ERP Applications such as Payroll, Hospital Management System and other HRM activities have been implemented.

b. Extending facilities to its employees, NALCO has introduced web-based applications on Travelling Allowance, Medical Bills Claim processes (for both existing & retired), employee exit processing system through on line platform.

c. For a better Central Stores management a barcode based warehouse management system has been implemented at Refinery plant.

d. For governance and monitoring, online web-based applications such as Capital Expenditure, Fund monitoring, Compliance Management System, etc. have been implemented.

e. To have faster file processing timing, "File Tracking System" has been introduced for capital project files.

f. "Bill Tracking System", a web-based portal for vendors, was launched for vendors. This portal facilitates vendors to register themselves and track invoices and know the payment details of their respective bills including raising of grievances.

7.21 Adding to the array of Apps for

stakeholders (CSR App for citizens at large, Retired Employees App and Customers App), an App and corresponding portal for MSE vendors was launched:

“NAMASYA”- NALCO Micro And Small enterprise Yogayog Application, a bi-lingual App for MSE vendors. The App provides a platform to highlight NALCO’s efforts towards development of MSE. The App empowers MSEs with required information about vendor registration process, items required by NALCO with details of technical specification, vendor development and MSE training programmes of NALCO etc.

7.22 On the Infrastructure front, the in-house state-of-the-art Data Center and the Disaster Recovery site are in place. Plants and Offices are networked with fault tolerant and redundant Multi-Protocol Label Switching (MPLS) circuits. Services include multichannel video conferencing, with external agencies. Server farms have green technology Virtualized Server implementation. Digital Notice Board has been introduced to facilitate easy and fast dissemination of notices, pictures, audio/video, etc.

7.23 The IT roadmap has been aligned to partner in the Company’s growth. Emphasis is being placed on Analytics and Decision Support system to aid decision making process at various levels of management. In line with this vision, an all-encompassing dashboard for Sales and Distribution has been developed. This would provide the management with insights into company’s sales performances and industry related data.

7.24 In pursuit of an efficient, transparent and secure file processing system, e-office is under implementation.

7.25 The IT policies, processes and SoPs have been aligned as per requirements of the ISO 27001 standards, and issued for compliance. The scope covers the full arena of IT Security for IT infrastructure, Applications and Users. IT infrastructure and application security is ensured with network gateway and endpoint security solutions. Implementation effectiveness is further assured with application and security audits.

Action Taken on Pollution Control and Environment

7.26 As a Responsible Corporate Entity, NALCO is pioneer in the front of Pollution Control and Environment Management and is committed for a cleaner, greener and safe working environment in all its production units. All production units are certified to International Standards on Environmental Management Systems (ISO14001) as well as Occupational Health and Safety Management Systems (OHSAS 18001).

7.27 The Global Climatic Change scenarios along with Global Warming have forced the regulators to enforce stringent Environmental regulation day by day. However being certified to international Standards NALCO proactively takes steps to face the challenges of upcoming stringent statutory regulations from time to time. NALCO publish a Sustainable development Report every year aligned with the International guideline (GRI G4).

Procurement

7.28 Against mandatory target of 25% procurement from MSMEs, NALCO achieved 26.79 % of total procurement in FY 2018-19.

7.29 Total procurement by the Company from MSEs including SC/ ST MSEs & women owned MSEs – ₹ 473 crore (against ₹ 400 crore in FY 2017-18) out of which SC/ST MSEs: ₹ 12.88 crore & women owned MSEs: ₹ 5.64 crore.

7.30 Total procurement by the Company through GeM portal is ₹ 3.6 crore in FY 2018-19.

7.31 Reverse auction introduced intenders of materials including raw materials. Total 5 nos. of reverse auction done & notional cost reduction due to reverse auction is ₹ 23.34 crore In FY 2018-19.

Industrial Relations

7.32 NALCO signed the 6th long-term wage settlement pact with its five recognized trade unions on 24th Feb'19.

7.33 The overall Industrial Relations scenario in the Company remained cordial and provided a positive climate for achieving overall performance excellence for the Company for the year.

7.34 MOU rating of NALCO during the last three years:

Year	Composite Score	Grade
2013-14	1.562	Very Good
2014-15	1.258	Excellent
2015-16	91.19%	Excellent
2016-17	88.48%	Very Good
2017-18	91.88%	Excellent

Aluminium Industry in India

7.35 The Indian primary aluminium industry consists of three major players i.e. National Aluminium Company Limited (NALCO), Hindalco Industries and Vedanta Ltd.

7.36 The total domestic production of aluminium metal by aluminium producers in the year 2016-17 to 2018-19 is at **Table 7.4.**

7.37 The total production of Primary Aluminium metal during FY 2018-19 was about 3.70 million tonne and in FY19-20, it is expected to further increase, as domestic aluminium producers may try to achieve their total rated production capacity of about 4.1 million tonne. During 2018-19, the total domestic sales of primary metal by the major primary producers, i.e., NALCO, Hindalco and Vedanta was 1.65 million tonne.

7.38 The aluminium per capita consumption level in India continues to be very low i.e. it stands currently at around 2.5 kg against the world average of roughly 11 kg. In India, the power sector continues to be the major consumer of aluminium with almost 40% share of total aluminium consumption in the country. Besides this, strong growth prospects are also seen in packaging, machinery & equipment, construction and consumer durables sectors.

7.39 Aluminium has been continuously finding new applications due to rising price competence since it is cheaper than copper, due to its superior weight to strength ratio, corrosion resistance, formability, dampness etc. Reforms proposed by the Government of India like the Make in India Campaign, Smart Cities, Rural Electrification and a focus on building renewable energy projects under the National Electricity Policy have augmented the usage of the metal during FY 2018-19. Buoyant demand and market recovery across businesses in India is to further increase the demand for aluminium.

Table 7.4
Production of Aluminium in India

(Figs. in MT)

SI No.	Producer	2016-17	2017-18	2018-19
1	NALCO	3,87,422	4,25,515	4,40,242
2	HINDALCO	12,64,062	12,88,351	12,96,468
3	VEDANTA GROUP	12,13,099	16,69,741	19,58,422
	TOTAL	28,64,583	33,83,607	36,95,132

(Note: Production figures pertaining to other primary producers are based on available market data)

7.40 The sales figure of aluminium (Domestic Sales of Aluminium & Export Sales of Aluminium in India are given in **Table 7.5** and **Table 7.6**.

Table 7.5
Domestic Sales of Aluminium

(Figs. in MT)

SI No.	Producer	2016-17	2017-18	2018-19
1	NALCO	2,84,926	3,50,469	4,02,134
2	HINDALCO	6,62,902	6,40,617	6,36,120
3	VEDANTA GROUP	5,97,300	6,71,946	6,15,910
	TOTAL	15,45,128	16,63,032	16,54,164

(Note: Domestic sales figures pertaining to other primary producers are based on available market data)

Table 7.6
Export Sales of Aluminium

(Figs. in MT)

SI No.	Producer	2016-17	2017-18	2018-19
1	NALCO	1,00,591	75,847	38,463
2	HINDALCO	6,00,505	6,49,986	6,58,935
3	VEDANTA GROUP	6,10,657	9,98,522	13,40,201
	TOTAL	13,11,753	17,24,355	20,37,599

(Note: Export sales figures pertaining to other primary producers are based on available market data)

Hindustan Copper Limited (HCL)

Introduction:

7.41 Hindustan Copper Limited (HCL), a Mini Ratna Government of India (GoI) Enterprise under the administrative control of the Ministry of Mines, was incorporated on 9th November 1967 under the Companies Act, 1956. It was established as a Govt. of India Enterprise to take over all plants, projects, schemes and

studies pertaining to the exploration and exploitation of copper deposits, including smelting and refining from National Mineral Development Corporation Ltd. It is the only company in India engaged in mining of copper ore and owns all the operating mining lease of copper ore and also the only integrated producer of refined copper (vertically integrated company). Major activities of HCL include mining, ore beneficiation, smelting, refining and casting

of refined copper metal into downstream products. HCL has acquired assets of Jhagadia Copper Limited from M/s Asset Reconstruction Company (India) Limited in 2015-16 and renamed as Gujarat Copper Project (GCP). With this acquisition HCL now have five operation units - one each in the states of Rajasthan, Jharkhand, Madhya Pradesh, Gujarat and Maharashtra. HCL is a listed company on BSE and NSE, with 76.05 % equity owned by the Government of India.

7.42 Highlights of 2018

i. Production: Copper Ore production at 41.22 lakh tonne during the financial year ending March 2019 which is the highest in last 20 years.



Kaldo Furnace

- ii. Metal-in-Concentrate (MIC) production is 32,439 MT during the financial year ending March, 2019 which is highest in last 16 years.
- iii. Total copper sales during the year 2018-19 is 38,321 tonne best in the last 9 years.
- iv. Major overhauling of flash furnace at Indian Copper Complex, Ghatsila was done in May-June, 2018.
- v. New Coiler for continuous cast copper wire rods at Taloja, Maharashtra was commissioned.
- vi. HCL is in ramping up stage of Copper Ore Tailing (COT) recovery facility of capacity 3.3 million tonne per annum (mtpa) to recover the valuable metals and minerals like gold, silver, copper, magnetite, glass grade silica, micronutrients etc.
- vii. The Government has given its approval to HCL for issue of fresh equity shares to the extent of 15% of paid up equity capital through the Qualified Institutional Placement (QIP)
- viii. HCL board has approved revised mine expansion plan from present level of 3.4 mtpa ore production to 20.2 mtpa over next six years.
- ix. HCL has been entrusted to do the exploration activities and action in this direction has already been initiated.

Authorized Capital Structure of HCL

a) Authorized Capital:		
i)	180 crore Equity shares of ₹ 5/- each	₹ 900 crore
ii)	20 lakh Preference shares of ₹ 1000/- each	₹ 200 crore
	Total	₹ 1,100 crore
b) Issued, Subscribed and Paid-Up Capital		
i)	92, 52, 18,000 equity shares of ₹ 5/- each	₹ 4,62, 60, 90,000/-
	Total	₹ 4,62, 60, 90,000/-

7.43 Present capacities of HCL's Mines, Smelters and Wire Rod are given in **Table 7.7**, **Table 7.8** and **Table 7.9**.

Table 7.7
Production Capacity of Mines under HCL

Location of Mines	Ore Capacity (lakh tonne per annum) (As per IBM approved Mine Plan)
Khetri Copper Complex, Rajasthan*	14.00*
Malanjkhand Copper Project, Madhya Pradesh	20.00
Indian Copper Complex, Jharkhand	4.00
Total	38.00

* - includes production capacity of Khetri, Kolihan and Banwas mines

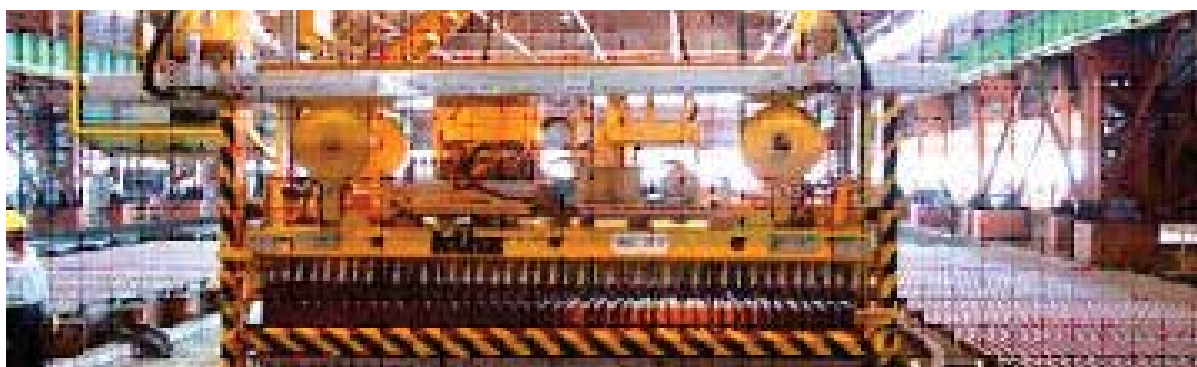
Table 7.8
Production Capacity of Smelters under HCL

Location of Smelters	Metal Capacity (Tonnes per annum)
Khetri Copper Complex, Rajasthan	31,000**
Indian Copper Complex, Jharkhand	18,500
Gujarat Copper Project, Jhagadia	50,000
Total	99,500

** - Plant not operational since Dec., 2008 due to economic reasons

Table 7.9
Production Capacity of Wire Rod Plant under HCL

Location of Plant	Capacity (Tonnes per annum)
Taloja Copper Project, Maharashtra	60,000
Total	60,000



Refinery Cell Loading

7.44 Production of ore, metal in concentrates, refined copper (cathode) and wire rod during the year 2016-17, 2017-18 and 2018-19 are shown in **Table 7.10**.

Table 7.10
Physical Performance of HCL

Product	Actual for the previous 2 years		Target for FY 2018-19	Actual for FY 2018-19
	FY 2016-17	FY 2017-18		
Ore Production('000MT)	3,845	3,675	3,900	4,122
Metal in Concentrate (MT)	30,587	31,793	32,000	32,439
Refined Copper (Cathode) (MT)	18,602	25,949	28,000	16,215
Wire rod (MT)	18,167	22,211	23,964	21,644

7.45 Financial Performance of the Company for FY 2016-17, 2017-18 and 2018-19 is shown in **Table 7.11**.

Table 7.11
Financial Performance of HCL

(₹ in crore)

Sl. No.	Details	Actuals for the previous 2 years		Target for FY 2018-19	FY 2018-19 (Anticipated)
		FY 2016-17	FY 2017-18		
1	Turnover	1216.94	1647.90	1724.66	1724.66
2	Net Profit/(Loss) before Income Tax	94.20	121.69	103.25	103.25
3	Net Profit/(Loss) after income tax	61.94	79.60	71.74	71.74

7.46 The capital structure of the Company as on 31st March, 2019 is as follows:-

Sales Performance

7.47 The Company has achieved total sales of 38,321 tonne of copper (wire rod, cathode and metal in concentrates (MIC)) during the financial year 2018-19.

Mine Expansion Schemes

7.48 The Company's strategy is to aggressively expand its mine and ore

beneficiation capacities. Such a strategy would also enable the company to sustain its profitability even at lower copper prices and also position it to remain a dominant copper player in the country. A road map has been prepared for enhancing its mine production from current level of 3.4 million tonne per annum to 20.2 million tonne per annum in the next 6 years. The capex requirement for the mine expansion plan is ₹5,500 crore. Besides, ₹175 crore will also be spent for exploration activities spread over three years.

R&D Activities

7.49 During the year the Company has taken following projects:

- i. Recovery of copper through leaching from Electrostatic Precipitator (ESP) dust of flash smelter has been successfully carried out.



Drilling operation in progress at Surda Mines

- ii. Experiments on bismuth removal from electrolyte were carried out at Gujarat Copper Project using barium carbonate at different dosage and temperature. Optimum dosage of Barium carbonate has been established at lab scale. Further the same experiment has been scaled up and done in refinery using commercial grade in existing operational conditions; it is observed that removal of bismuth upto 58.5% was observed at 6 Kg/m³ dose.

7.50 Energy Conservation.

- (i) High wattage conventional lights were replaced by low power consuming LED lights.
- (ii) Premium class IE-3 energy efficient motors were introduced in place of 30-40 years old conventional motors in Flash Smelter & Refinery in phased manner at Ghatsila.
- (iii) 14 nos. 22.5 KW motors were replaced

with EEF motors of 18 KW at MCP, Malanjkhand.

7.51 Environment

- i. HCL has developed an indigenous technology to process the ore tails (a waste product of concentrator plant) to recover valuable minerals and metals. The plant based on this indigenous technology having capacity 10,000 MT per day waste treatment is under commissioning at MCP (Malanjkhand Copper Project, MP). This is waste to wealth project of HCL.

- ii. Online Emission Monitoring system for Stacks and Effluent monitoring system for CETP final treated discharge water has been installed at ICC and data is being transmitted to CPCB in every 15 minutes.

- iii. HCL emphasizes prevention and minimization of waste generation at source. Reuse and recycling of waste is given prime importance. The waste which is generated beyond the above set practices is disposed in a safe and environmentally sound manner as per the guidelines prescribed by the Pollution Control Boards.

- iv. Malanjkhand Copper project has been awarded ISO 14001:2015 certification for the Environment management system.

Information Technology (IT) Initiatives

7.52 The following IT initiatives, spanning all operational areas taken up by the Company for bringing about dynamism, transparency and business efficiency, are being maintained and updated. Major initiatives are:

➤ Enterprise Resource Planning (ERP) implementation

Maintaining ERP (Oracle eBiz Suite

R12.1.3) implementation has enabled HCL to adopt a centralized business management platform based on which the entire company has been thoroughly unified, increased real-time visibility of critical business parameters, thereby strengthening financial management & spares control, supply chain management, customer service and HR functions. Audited financial results have been finalized within scheduled planned time.

➤ **E-Procurement/EPS**

Procurement of Stores & Spares items above 2.0 lakh continues to be done through Enterprise Procurement System (EPS), conducted by third party namely M-Junction, Kolkata. E-reverse auction for procurement of high value item is in place.

➤ **Real time LME booking**

The web based system is in place to enable customers to place on-line orders for copper wire rod and cathode with the Company in a Real time London Metal Exchange (LME) rate scenario.

➤ **On-line Recruitment**

On-line recruitment module developed and in operation from this year and well-integrated with payment gateway to accept the online forms for recruitment. Through the module HCL can operate multiple online recruitment processes in parallel.

Sustainable Development

7.53 HCL adheres to the sustainable development requirement as per the guidelines and policy of the Department of Public Enterprises (DPE). Following projects are implemented under sustainable development plan for the year 2018-19:

- i. Covering top soil & plantation at the waste rock dump at Malanjkhanda, Madhya Pradesh.
- ii. Significant progress has been done towards implementation of roof top solar plant across the organization. Under the same scheme installation of roof top solar plant of 200 Kwp capacity at Khetri Copper Complex, Khetrinagar has been taken up under RESCO model of MNRE.
- iii. Water conservation by recycling of mine water.

Manpower Strength

7.54 The manpower strength of the Company as on 31.03.2019 is 2195 is in **Table 7.12**

Table 7.12

Category	SC	ST	OBC	General	Total
Executives	101	30	113	354	598
Non-Executives	289	268	200	840	1,597
Total	390	298	313	1,194	2,195

Copper Industry in India

7.55 Copper finds widespread use in a wide range of application in all major sectors namely, construction, electric & electronic products, industrial machinery & equipment, transportation equipment & consumer and general products.

7.56 At present, the demand for copper minerals in the country for primary copper production is met through two sources i.e. copper ore mined from indigenous mines and imported concentrates. The indigenous mining activity among the primary copper producers is limited to only Hindustan

Copper Limited (HCL). The other primary copper producers in the private sector import the required mineral in the form of concentrate.

7.57 Currently, three major players dominate the Indian Copper Industry. Hindustan Copper Limited (HCL) in Public Sector, M/s Hindalco Industries and M/s

Sterlite Industries in Private Sector. HCL is the only vertically integrated copper producer in the country, while M/s Hindalco Industries at Dahej in Gujarat and M/s Sterlite Industries in Tuticorin in Tamil Nadu have set up port based smelting and refining plants. Production is given in **Table 7.13**.

Table 7.13
Production of Copper in India (in tonne)

Commodity	Number of Factories	Installed Capacity	Production during 2017-18	Production during 2018-19
Cathode				
a) HCL	3	99,500	25,949	16,215*
b) Sterlite Industries Ltd.	1	4,50,000	4,03,208	89,739**
c) Hindalco Ind. Ltd. (Unit: Birla Copper)	1	5,00,000	4,13,807	351291

* Less production due to planned smelter shut down at Ghatsila, Jharkhand, however MIC production in 2018-19 was 32,439 MT.

** Less production due to closure order issued to Sterlite Smelter/ refinery plant at Tuticorin by Tamilnadu Govt. in May, 2018



Winder room in Kolihan mine



Refined Copper Consumption

7.58 The Indian demand is expected to be strong on the back of improved outlook for Industrial and infrastructure growth. The government's thrust on power sector, smart city, housing for all, ambitious plan of harnessing renewable energy resources, electric vehicles, Infrastructure development etc. spells good news for copper industries. The per-capita copper consumption in India is expected double in coming 6 years from the current level of 0.5 Kg to 1 Kg.

7.59 According to International Copper Study Group (ICSG) press release dated 03.10.2018, world apparent refined copper usage was expected to increase by around 2.1% in year 2018 and 2.6% in 2019. However, the world apparent refined usage in the year 2018 is increased by about 2% (ICSG press release dated 20.03.2019). The sustained growth in copper demand is expected to continue because copper is essential to economic activities and even more so to the modern technological society. Infrastructure development in major countries such as China and India and the global trend towards cleaner energy will continue to support growth in copper demand.

Reserves & Resources

7.60 India has very limited known reserves of copper ore exploitable for copper production. The total resources of copper ore in the country as on 1.4.2015 are estimated at 1511.50 million tonne with about 12.16 million tonne of copper metal. Of these 207.77 million tonne (13.74%) fall under Reserve category containing 2.73 million tonne of copper metal and the balance 1303.73 million tonne (86.25%) are 'Remaining Resources' containing 9.42

million tonne of copper metal. Rajasthan is credited with 813.33 million tonne ore (54%) containing 4.48 million tonne of copper metal, Madhya Pradesh 283.43 million tonne ore (19%), containing 3.42 million tonne copper, Jharkhand 295.39 million tonne ore (20%), containing 3.28 million tonne of copper metal and the rest 7% are accounted for by other states namely Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharashtra, Meghalaya, Nagaland, Odisha, Sikkim, Tamil Nadu, Telangana, Uttarakhand and West Bengal. India's share of world reserve is 1.8% only. According to United States Geological Survey (USGS), total global copper reserves amount to 790 million tonne (Mt) of copper. Globally, Chile has the largest reserves of copper accounting for about 22% of the total world reserves followed by Australia 11%, Peru 10%, Mexico 6%, USA 6%, China 3%, DR Congo and Zambia 3% each and other countries 32%.

7.61 The mean undiscovered totals for porphyry and sediment-hosted deposits are 3,100 Mt and 400 Mt respectively, resulting in a global total of 3,500 Mt of copper. With identified copper resources currently estimated at 2,100 Mt, total copper resources (undiscovered + identified) are estimated at 5,600 Mt. As on April 1, 2018, HCL hold around two-fifths of the copper ore reserves in India, with an average of 1.02% copper content. HCL as on 1.4.2018 has reserves (proved & probable) of 222.06 million tonne ore (average grade 1.31%) and total reserve and resources of 570.68 million tonne ore (average grade 1.02%) spread over seven mining leases.

Price of Copper

7.62 The domestic price of copper is linked to London Metal Exchange (LME) price. The

LME Cash Settlement Price (CSP) is the basis on which prices of copper products are declared by domestic producers.

7.63 The year wise average LME price per tonne of copper is as indicated in **Table 7.14**.

Table 7.14

The Year-wise Average LME Price of Copper

Year	Average LME price of Copper (US \$ per tonne)
2006-2007	6,970
2007-2008	7,584
2008-2009	5,864
2009-2010	6,101
2010-2011	8,140
2011-2012	8,485
2012-2013	7,855
2013-2014	7,103
2014-2015	6,554
2015-2016	5,215
2016-2017	5,154
2017-2018	6,444
2018-2019	6,340

Mineral Exploration Corporation Limited (MECL)

7.64 Mineral Exploration Corporation Limited (MECL), a Miniratna Category-I PSU under Ministry of Mines, is carrying out mineral exploration activities and is the premier exploration agency in the country. It carries out its exploration activities

through Promotional Programme and National Mineral Exploration Trust (NMET) of Govt. of India as well as contractual basis on behalf of other agencies including Public Sector, Private Sector and State Government(s) on mutually agreed terms and conditions. It has added 171 billion tonne of mineral resources to National Mineral Inventory upto March '2019.

7.65 The authorised share capital and paid up equity of the company are ₹ 125.00 crore and ₹ 119.55 crore, respectively. The equity is fully held by Govt. of India. The company's registered office is at Nagpur, (Maharashtra). To facilitate the prompt maintenance of plants and machineries deployed at various projects, two Regional Maintenance Centres at Ranchi and Nagpur are being operated. Technical guidance to the projects, finalisation of geological reports, close liaisoning with the clients and looking for new business opportunities is being carried out through the Zonal Offices located at Ranchi, Hyderabad and Nagpur. The business generation and commercial activities of the Company are being looked after by Business Development and Commercial Division at Nagpur. In addition, one Business Development unit is in operation at New Delhi and a Liaison office at Kolkata.

7.66 Since its inception, MECL has carried out detailed exploration under Promotional Scheme of Govt. of India for ferrous, non ferrous, base metal, precious, industrial and other minerals on behalf of Ministry of Mines and a total of 8.09 billion tonne of resources have been established in respect of above said minerals.

7.67 Post MMDR Amendment Act 2015, and after formation of NMET, the company

is taking up exploration work for Govt. of India and State Governments through NMET only.

7.68 MECL is also engaged in regional exploration of coal & lignite on behalf of Ministry of Coal. The schemes of exploration are being finalised by the Core Group of Committee on Energy Minerals and Resources, Group V of Central Geological Programming Board (CGPB). So far, a total of 51.56 billion tonne of coal and 31.50 billion tonne of lignite resources have been established by MECL on behalf of Ministry of Coal upto March 2019.



Graph showing enhancement of drilling productivity of MECL

Dividend Paid

7.69 MECL has paid an interim dividend of ₹ 19.73 crore to Govt. of India for the year 2018-19.

7.70 MoU PERFORMANCE

MoU rating of MECL during last 3 years.

Year	Composite Score	Rating
2015-16	87.18	Very Good
2016-17	83.42	Very Good
2017-18	63.39	Good

Awards & Achievements

7.71 As a result of continuous growth and profit, MECL's status has been upgraded

from Miniratna-II category to Miniratna-I category on 17th December 2018.

Start Up India

7.72 As per the Govt. of India initiative to promote Start Up, MECL has registered 11 new MSME vendors with GST numbers. This is also an MoU parameter which has been achieved under Excellent category.

Perspective on Non-Ferrous Minerals

7.73 During the year 2018 -19 exploration for various minerals has been carried out by MECL in 23 blocks. Out of these, exploration in 9 blocks have been completed and work is in progress in rest 14 projects.

7.74 The brief account of exploration activities by MECL for Govt. of India and State Govts is as under

7.75 Projects under Promotional Scheme.

- KGF Project for Gold ,(Gap area of Mc Taggart West Block), District Kolar, Karnataka (G-2)
- KGF Project for Gold ,(Gap area of Oriental Lode Block), District Kolar, Karnataka (G-2)

7.76 Project Funded by Mineral Exploration Fund (MEF)

- Jaitpur (Potash) Block, District - Bikaner, Rajasthan (G-4)

7.77 Project Funded by National Mineral Exploration Trust (NMET)

- Gothra-Parashrampura (Limestone) Block, District Jhunjunu, Rajasthan (G-3)
- Nahardih (Limestone) Block, District Raipur, Chhattisgarh (G-3)

- | | |
|---|--|
| iii. Jumka-Pathiriposhi (Iron ore) Block, District Sundergarh, Odisha (G-2) | xii. Tamiya (Manganese) Block, District Bolangir, Odisha (G-2) |
| iv. Saraipani- Dadar (Bauxite), District Kabirdham, Chhattisgarh (G-2) | xiii. Rengali (Manganese) Block, District Bolangir, Odisha (G-2) |
| v. Nonbirra (Coal) Block, District-Korba, Chhattisgarh (G-2) | xiv. Diggaon (Limestone) Block, District Kalaburagi, Karnataka (G-3) |
| vi. Palayamkottai (Lignite) Block, District-Cuddalore, Tamil Nadu (G-2) | xv. Udagi (Limestone) Block, District Kalaburagi, Karnataka (G-3) |
| vii. Recherla (Coal) Block, District West Godavari, Andhra Pradesh (G-2) | xvi. Lakhasar (Potash) Block, District Bikaner, Rajasthan (G-4) |
| viii. Veeranam (Lignite) Block, District-Cuddalore, Tamil Nadu (G-2) | |
| ix. Malangtoli (Iron ore) Sub-block H, District Sundergarh, Odisha (G-2) | |
| x. Naubasta-Kolard (Limestone) Block, District Satna, Madhya Pradesh (G-2) | |
| xi. Jamodi-Mahanna (Limestone) Block, District Satna, Madhya Pradesh (G-2) | |

Physical Financial Performance 2017-18

7.78 The physical performance in drilling and geological reports for 2016-17, 2017-18 and 2018-19 is given in **Table 7.15** and the financial performance is given in **Table 7.16**.

7.79 During the FY 2017-18, MECL successfully implemented IND-ASI.e. Indian

Table – 7.15
Physical Performance of MECL

Items	2016-17 Actuals	2017-18 Actuals	2018-19	
			Target	Actual Achmt. (Prov.)
Drilling (Mtrs)	5,19,466	6,32,115	6,32,000	610979
Geological Reports (Nos.)	38	63	50	39

Table No. 7.16
Financial Performance of MECL

(₹ in crore)

Details	2016-17 Actuals	2017-18 Actuals	2018-19	
			Target	Actual Achmt. (Prov.) (For 2018-19)
Total Revenue #	364.70	385.51	455.00	367.67
Operating Cost	195.80	230.23	267.90	211.28
Depreciation and DRE	7.63	7.37	10.00	9.50
Net profit After Taxes	104.86	97.48	114.24	95.54

Including other income

Accounting Standards. These are India specific version of International Financial Reporting Standards (IFRS) applicable to companies crossing the threshold limit mandated by Ministry of Corporate Affairs Govt. of India. The Comptroller & Auditor General of India (CAG) completed its audit of IND-AS complied accounts of the company and issued 'Nil' comments on it.

Auctioning of Blocks

7.80 During 2018-19, eight blocks explored by MECL have been auctioned for mining. The details are given below:

- i. Chigargunta-Bisanatham, (Gold ore), Chittoor district, Andhra Pradesh
- ii. Mysore Minerals Limited (Iron ore), Bellary district, Karnataka
- iii. Nidhi Mining Company (Iron ore), Bellary district, Karnataka
- iv. Bharat Mines & Minerals, (Iron ore), Bellary district, Karnataka
- v. Kanhailal Dhuderia, (Iron ore), Bellary district, Karnataka
- vi. H G Rangangauda, (Iron ore), Bellary district, Karnataka
- vii. M.Chennakeshava Reddy (Iron Ore), Bellary district, Karnataka
- viii. Minerals Miners & Traders (Iron Ore), Bellary district, Karnataka

Action Taken on Abatement of Pollution and Environment:

7.81 MECL is committed for conservation, prevention of degradation and equity of natural resources to ensure an eco-friendly environment in all areas of its operations for sustainable growth.

R&D Projects

7.82 To enhance the mineral exploration initiative, MECL continuously made efforts on Research and Development in mineral exploration area. The list of R&D work for 2018-19 are given below:

Project I : Development of a WD-XRF/ AAS analysis method for minor and trace elements in commercially important Mineral ores:

Project II : Technology Development of Drilling Fluid in Coal, Lignite, Copper and Halite exploratory drilling projects:

Project III : Design and Development of low cost Drilled Borehole Deviation measurement system:

Project IV : Design & Development of 10 nos. HQ double tube core barrel assembly with additional inner tube assembly:

Information Technology (IT)

7.83 Using available I.T. Infrastructure, Data processing of total 39 nos. of Geological reports for the blocks explored by MECL, under Promotional (MOM / MEF), Contractual exploration and NMET were carried out for the financial year 2018-19. Out of the 39 nos., 13 nos. of Coal reports, 24 nos. of Base metal Reports and 2 nos. of Lignite Reports were completed in FY 2018-19 respectively.

SAP ERP Implementation in MECL

7.84 The ERP solution is planned to automate the major operations of MECL – Finance & Costing, Asset Management, Business Development & Customer Billing, Drilling Operation, Project Management/ Exploration, Machine Maintenance, Quality Management – Sample preparation & Testing, Materials and Stores, Procurement Management and

Human Resource Management, General & Payroll administration. The ERP solution addresses the processes of MECL at the Corporate HQ, the regional offices and all the project offices.

7.85 MECL has installed a latest state of art Data Center for hosting the ERP solution, networked all its offices and project sites, and has provided the necessary client side hardware like PCs/ Laptops and printers to all the users of the ERP solution.

7.86 The ERP solution is implemented to provide the following business benefits/ business objectives.

- Customer focus in terms of timely completion of activities, accuracy in billing and reconciliation.
- Efficiency of operations – efficient usage of machines, tools and accessories.
- Productivity of resources – the men, machines, material and money.
- Transparency/ compliance to all the stake holder requirements and government regulations.

- Wastage reduction.

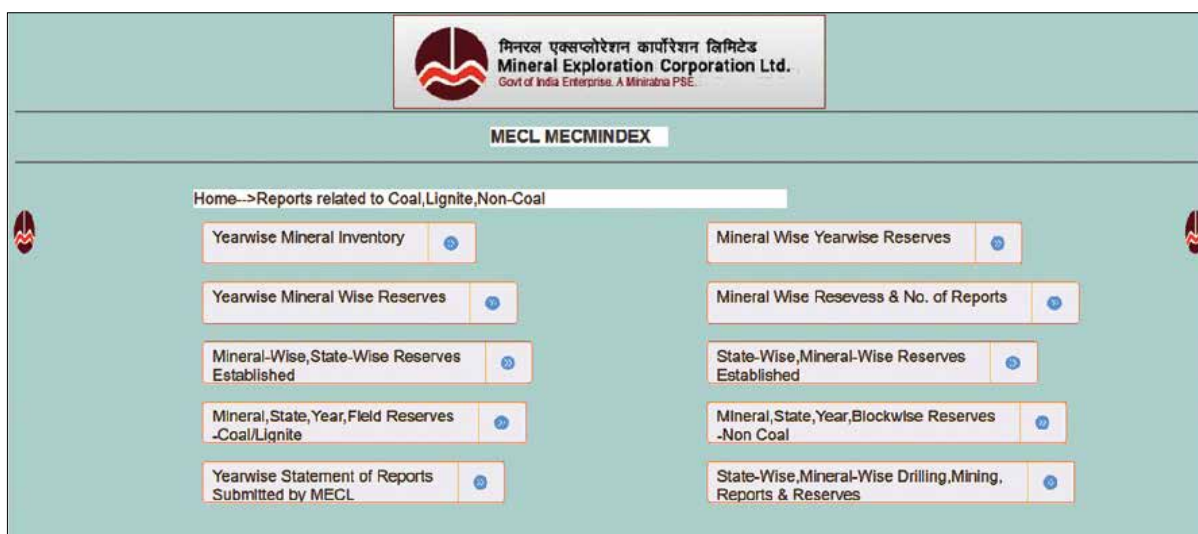
7.87 Developed a new Non-Coal GR Cell for processing of growing numbers of Non-Coal Geological Reports, as per MOU target of MECL.

7.88 Development of a new Hindi CSR Mobile App is in process, as per the advice of Rajbhasha Karyanvayan Samiti, Ministry of Mines.

7.89 The existing **MECL website was shifted to the latest NIC cloud server.** MECL has provided Email accounts, of the domain mecl.co.in to all its executives up to E1 level and above. Management of the Email accounts is being done through Delegated Admin Console in-house.

7.90 Developed **in-house employee Portal** namely “MECL Connect” accessible to all employees, for online HRMS activity of MECL, as per the MOU target.

7.91 Developed In-house new application **“MECMINDEX” for Block-wise resource inventory management.** Business Development Activity



MECMINDEX : MECMINDEX Application

Business Development Activity

7.92 Through Business Development & Commercial Division, rigorous efforts are continued to generate/obtain more work orders from both private and public sectors organisation through competitive Techno-commercial offers and MoU route as well as bilateral negotiations. As a result, during the financial year 2018-19, the total value of order book stood at ₹ 482.39 crore This includes contractual work of various clients such as CMPDI, DMG Karnataka, HCL, CIL etc. and Promotional work including NMET and MEF work on behalf of Ministry of Mines and regional coal exploration work on behalf of Ministry of Coal (MOC).

7.93 As a Nodal Exploration Agency of National Mineral Exploration Trust (NMET) MECL has signed **“Tripartite Agreement”** with NMET and 14 State Governments Viz. Maharashtra, Andhra Pradesh, Odisha, Chhattisgarh, Jharkhand, Madhya Pradesh, Karnataka, Rajasthan, Telangana, Tamil Nadu, Uttar Pradesh, Bihar, West Bengal and Jammu & Kashmir.

Efforts were made to reach out to all prospective clients viz. Government, PSU and private sector for securing business and for sustainable growth of the company.

Future Plan

7.94 To achieve its vision, MECL has prepared ‘Corporate Rolling Plan’ upto 2022 for Enhancement in Growth and Profitability of MECL’. Salient feature of the Corporate Rolling Plan are given below:

- Replacement of old conventional drills with modern Hydrostatic drills in phased manner
- Planned recruitment and Skill development of manpower.

- Infrastructure Development: Construction of modern and State of the Art building for Laboratories and Workshop at Utility Complex of MECL, Nagpur
- Gearing up for faster & more accurate survey by addition of DGPS etc
- Up gradation of workshop by installation of Induction Hardening Plant, setting up diamond bit manufacturing plant, Gear Hobbing Machine, CNC etc. for reliable and uninterrupted supply of accessories.
- Modernization and expansion of laboratory by purchasing of AAS, XRF, XRD, Derivatograph etc. for enhancing capacity of analytical studies.
- Increase in outsourcing of drilling work to meet additional drilling requirement.
- Augmentation of IT enabled software facilities for 3D ore body modelling and geological models for resource estimation



The new Laboratory Complex of MECL at Nagpur

7.95 Construction of new & ultramodern infrastructure for laboratories has been completed and commissioning of the facilities are under progress including state-of-the-art laboratory equipment.

7.96 MECL has also signed a Mining Lease (ML) deed for mining of bauxite in Serengdag block, Chhattisgarh. The clearance from National Board for Wild Life (NBWL) is being pursued.

Manufacturing Unit

7.97 MECL has a well equipped central workshop and manufacturing unit at Nagpur to cater to the needs of drilling and developmental mining projects and to provide engineering support to field operations. It carries out repairing/overhauling of drilling and mining equipment and light/heavy vehicles. It manufactures Tungsten Carbide (TC) bits and spares & accessories for coring and non-coring drill machines. Also, it has CNC lathe machine for the manufacturing of drill tubular. During 2018-19 a total of 9549 items were manufactured, which include 2732 TC bits and 6817 other drill accessories.

Bharat Gold Mines Limited (BGML)

7.98 Bharat Gold Mines Limited (BGML) has been closed since 1st March, 2001. The Cabinet had taken a decision in the year 2006 to dispose off the assets and

liabilities of the Company through an open tender, with First Right of Refusal (FROF) in favour of the co-operative society formed by the ex-employees of the Company. However, the Cabinet decision could not be implemented due to litigation. Finally in 2013, the Supreme Court allowed the Government to go ahead with the tender.

7.99 Presently, the matter of disposal of assets of BGML is under consideration.

Hindustan Zinc Limited (HZL)

7.100 Hindustan Zinc Limited (HZL) was disinvested on 28th March, 2002 and the management control of the company was also transferred to the Strategic Partner namely Sterlite Opportunity Venture Limited (SOVL) on 11th April, 2002. At present Government of India is holding 29.53% shares in HZL.

7.101 Government of India is given dividend by HZL every year. In the Financial Year of 2018-19, HZL has given Special Interim Dividend of ₹2495,90,11,800 @ 1000% i.e. ₹ 20 per share (₹ two thousand four hundred ninety five crores ninety lakhs eleven thousand eight hundred only) on the Government holding in the Company.



Inauguration of NALCO stall at 4th National Conclave on Mines & Minerals, Indore



**Science, Technology
and Autonomous Bodies**

Science, Technology and Autonomous Bodies

- Science & Technology Programme (R&D component) Page - 117
- Jawaharlal Nehru Aluminium Research Development & Design Centre Page - 118
- National Institute of Rock Mechanics Page - 122
- National Institute of Miners' Health Page - 123
- National Mineral Exploration Trust (NMET) Page - 124

Research & Development

Introduction

8.1 Recognizing the paramount importance of safety, economy, speed and the efficiency in extraction of mineral resources and in its convergence into viable economic alloys and metals, National Mineral Policy has accorded higher priority to R&D programmes. For fructification of principles as enunciated in the National Mineral Policy, guidelines for support to 'Mining Research' was issued in May 2013. With a view to promoting R&D in the mining sector, Ministry of Mines has launched a comprehensive Science & Technology Programme which includes (i) R&D component (ii) Information Education and Communication (IEC) and (iii) one-time capital component for up-gradation of R&D facilities of Jawaharlal Nehru Aluminium Research Development & Design Centre, National Institute of Miners' Health and National Institute of Rock Mechanics.

Science & Technology Programme (R&D component)

8.2 The underlying principle behind R&D component is to foster utilisation of the available mineral resources judiciously, economically, efficiently and in an environmental by sustainable manner. Under the R&D component of the Science & Technology Programme, Research projects are funded through grant-in-aid. The broad thrust areas for supporting research in mining sector include – (i) Prospecting exploration for strategic and rare earth minerals. (ii) Research in mining methods. This includes rock mechanics, mine designing, mining equipment, energy conservation, environmental protection and mine safety. (iii) Improve efficiency in process, operations, recovery of by-products and reduction in specification and consumption norms.

(iv) Research in metallurgy and mineral beneficiation techniques to utilize lower grade and finer size ores. (v) Extraction of value added products from mine waste, plant tailings etc. (vi) Development of new alloys and metal related products etc. (vii) Evolve low capital and energy saving processing systems (viii) Production of materials of high purity.

8.3 Based on scrutiny which passes through different stages of evaluation including presentation of shortlisted projects before the Project Evaluation and Review Committee (PERC) and final approval of an inter-ministerial Standing Scientific Advisory Group (SSAG) chaired by Secretary (Mines), grants are given to the projects submitted by R&D institutions.

8.4 During the Financial Year 2018-19, 19 projects which have been considered as relevant to the identified priorities have been approved by SSAG for grant-in-aid by the Ministry under S & T programme. List of projects approved in 2018-19 is at **Annexure-8.1 (Page No. 198)**.

Information, Education and Communication Component (IEC)

8.5 The purpose of this component of the Scheme is to create awareness regarding issues relating to the mining and mineral sector by organizing or being associated with promotional events, like seminars, workshops, exhibitions etc. evaluation studies, surveys, awareness programmes, consultation with stakeholders, organization of national and international events/conference, creating audio-visual publicity materials and propagation of policies and programmes.

8.6 Industry associations, recognized universities, recognized academic and

research bodies having at least three years experience in the mining and mineral sector are eligible for receiving funds under the scheme. Under this component, grant-in-aid of ₹ 10 lakh was released to FIMI during the year 2018-19.

“Grants for Creation of Capital Assets” Component for up-gradation of R&D facilities

8.7 The quality of R&D hinges upon availability of state of art research facilities in the country. In the mining sector R&D activities are being pioneered by the three autonomous bodies functioning under Ministry of Mines i.e. Jawaharlal Nehru Aluminium Research Development & Design Centre, Nagpur; National Institute of Miners’ Health, Nagpur; and National Institute of Rock Mechanics, Bengaluru. During the financial year 2018-19, grant to the tune of ₹ 322 Lakh has been released to JNARDDC for up-gradation of R&D facilities under “Grants for Creation of Capital Assets” Component.

8.8 Grants for Creation of Capital Assets and Grant-in-aid-Salaries provided to the three autonomous institutions under Ministry of Mines is given in **Table 8.1** and **Table 8.2**.

Table 8.1
Grants for Creation of Capital Assets

(₹ in lakh)

Institute	Actual
JNARDDC	322
NIMH	-
NIRM	-

Table 8.2
Grant-in-aid-Salaries

(₹ in lakh)

Institute	Actual
JNARDDC	512
NIMH	128
NIRM	702

Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur

8.9 JNARDDC an Autonomous Body under Ministry of Mines is a “Centre of Excellence” set up in 1989 as a joint venture of Ministry of Mines, Government of India and UNDP with a view to provide major R&D support system for the emerging modern aluminium industry in India.

8.10 The Centre is also recognized as a scientific & industrial research organization by the Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India. It is the only institute of its kind in India pursuing the cause of R&D from bauxite to finished product under one roof.

8.11 The objective of the Centre is to assimilate the technology available in the country and abroad for the production of alumina and aluminium including aluminium alloys as well as to develop technical know-how for the basic engineering process and downstream areas and to provide training to the personnel employed in the Indian aluminium industries.

8.12 The Centre caters to R&D needs of both primary and secondary producers. It has made key contribution in the areas of beneficiation, characterization,

technological evaluation, upgradation of bauxites, reduction of energy consumption and environmental pollution by the effective utilization of aluminium industry residue materials such as red mud, dross & scrap etc. and process modeling for the overall interest of the aluminium industry and the nation as a whole.

8.13 Major activities: The Centre completed ten projects in the field of aluminium and **fourteen** R&D projects are in progress for various government and non-government organization. The completed projects were :-

- Effect of modified seed properties in precipitation of aluminium hydroxide from Bayer liquor. **S&T (Mines)**
- Large scale digital database creation of Bauxite and Laterite deposits of Maharashtra State using geo-informatics technology. **S&T (Mines)** (Joint project with **Maharashtra Remote Sensing Application Centre, Nagpur& GSI.**)
- Studies on trace impurities, it's behavior & control in Bayer's process with respect to reduction in product hydrate. **NALCO**
- Mechanical activation of bauxite followed by technological studies. **NALCO**
- Characterization study and technical assessment of raw materials & related products. **Hi-Tech Metafluxes, Raipur**
- Supply of Equipment for online bath measurement. **HINDALCO, Hirakud**
- Synergistic utilization of aluminium industrial wastes for development of geopolymeric building materials with **S&T(Mines) & Swarnalata Holdings, Raipur.**

- Developing downstream application of strip cast aluminium alloys (AA8011 and AA3004) with **S&T (Mines), NALCO& VNIT, Nagpur**
- Estimation of Morphodynamicity and its remedial action using Red-mud based concrete at coastal zone of Eastern Odisha **S&T Mines** and **IIT, Bhunabeswar .**
- Status report on work carried out nationally and internationally on Red Mud to benchmark future investigation in the country **(S&T Mines)**

8.14 Science & Technology Projects sponsored by Ministry of Mines (Ongoing)

- i) Nano Processing of Industrial Rejects for use as additives in Mix-designs for improved pozzolanic reaction efficiency (Joint project with VNIT, Nagpur)
- ii) Fabrication of Advanced Ceramic Nano-coatings for Automotive Applications (Joint project with Christ University)
- iii) Techno-economic Survey of Aluminium Scrap Recycling in India
- iv) To study the fire retardency of nano-ATH in polymers (Joint project with CIPET)
- v) Bench scale study on extraction of pure Silica and smelter grade Aluminium Fluoride from Coal Fly Ash (CFA)



Stage-wise erection and commissioning of 14MN Extrusion press at JNARDDC, Nagpur

8.15 NABL Accreditation

JNARDDC has been granted the accreditation (9T-4561) by National Accreditation Board of Testing and Calibration Laboratories (NABL, New Delhi) in Jan 2019. This will lead to further expansion of the testing and consultancy services of JNARDDC.

8.16 Scientific Excellence Award, 2018

The 22nd International Conference on Non-Ferrous Mineral & Metals 2018 organized by Corporate Monitor during 6th-7th July 2018 was inaugurated by the Union

Secretary of Mines Shri Anil Gopishankar Mukim. During the conference, Director, JNARDDC was awarded with the Scientific Excellence Award 2018 at the hands of Secretary, Ministry of Mines for the dedicated research work on energy efficient techniques related to production and development of Super Thermal Aluminium Alloy (STAL) and high strength aluminium alloys by JNARDDC. The conference showcased several technical papers on National & International non ferrous sector addressing the current status, challenges, development as well as expansion program of non ferrous industry.



Director, JNARDDC receiving the award from Shri Anil Gopishankar Mukim, Secretary (Mines)



Release of JNARDDC Brochure during ANM-2018

8.17 Bureau of Energy Efficiency (BEE), Ministry of Power, Government of India has once again renewed the nomination of JNARDDC as a sector expert for the aluminium sector under the PAT-2 /PAT-3(Perform, Achieve & Trade) Scheme in the National Mission for Enhanced Energy Efficiency (NMEEE) under Climate Change Project. Director, JNARDDC has been nominated as the Chairman, Task force of aluminium sector. Services of JNARDDC are utilized by BEE as a sector expert for evaluation of energy audit reports of Indian aluminium industries and setting up normalization patterns for evaluating the performance of industries in terms of energy efficiency.

- The 7th International Conference on Aluminium and Exhibition (INCAL-2019) was held from January 31 to February 3, 2019 in Bhubaneswar, Odisha with JNARDDC as one of the key knowledge partners.

8.18 NITI Aayog strategy paper

JNARDDC was a part of the committee appointed by NITI Aayog to prepare the strategy paper for “Resource Efficiency in Aluminium Sector”. The document issued by NITI Aayog will open a new chapter in economy wide mainstreaming of resource efficiency and circular economy in India

8.19 Memorandum of Understanding (MOU)

JNARDDC signed five key MOUs with various national and international firms with a view to promote the cause of R&D and consultancy services.

- a) Imerys, India (France) (Beneficiation & Characterization of Refractory material)
- b) Sterling Educational Systems, Nagpur (Engineering partner for setting up pilot plant for SPL)

- c) Anant Resources, India (Sierra Leone), (Characterization of bauxite from Sierra Leone, Africa)
- d) Material Recycling Association of India (MRAI) (Aluminium industry waste management and recycling for environmental sustenance)
- e) Consultancy Engineering & Training Institute (CETI), Gurgaon (For collaborative projects in the areas of refractory grade calcined bauxite, specialty grade hydrate and alumina, vanadium sludge etc in India & abroad)

metro, irrigation, urban construction etc.). Of late it has expanded its activities to the oil sector (specialised testing), defence sector (on-shore and off-shore) and other miscellaneous sector (archaeology, environment etc.) Key area of activities of the Institute involve site characterisation which includes geological, geophysical and geotechnical investigations, excavation engineering, controlled blasting, numerical modelling, engineering seismology, mine design, slope stability, laboratory testing of rock samples and wire ropes and in-situ testing of various mining accessories using NDT technique.

National Institute of Rock Mechanics (NIRM)

8.20 National Institute of Rock Mechanics carries out varieties of investigations in the area of rock engineering and rock mechanics. The Institute extends R&D support and expertise to the mining sector (underground, opencast and quarries), energy sector (hydel, thermal and nuclear power) and infrastructure sector (rail, road,

8.21 Apart from industry-sponsored consultancy projects, the Institute also carries out R&D projects aimed at developing new technologies and methodologies for new areas of investigations. Such projects are sponsored by various private entities and government ministries. The institute has been enlisted by VTU for its academic programme leading to award of M.Tech. and Ph.D. in the field of rock mechanics research.



Fig. 1: Safe excavation of around 3.5 lacs m³ of hard rock by controlled blasting for the Darlipalli Super Thermal Power Project, Stage-I, NTPC

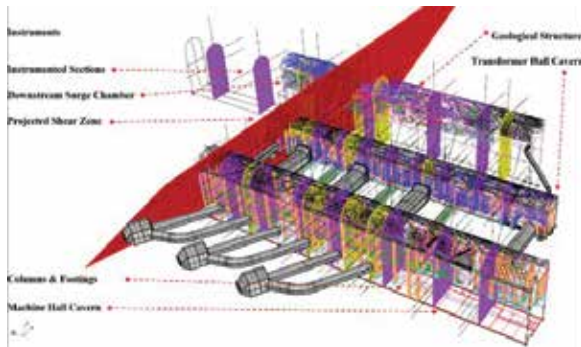


Fig. 2 : Planning and Design of Instrumentation layout and Network for Phunatsangchu-II, Powerhouse Complex, Bhutan with the help of 3D Model

8.22 Most of the technical departments of NIRM are accommodated at its head office at Bangalore where as all types of testing facilities are located at its registered office at Kolar Gold Fields. Out of the sanctioned strength of 82, the institute has 51 staff on which include 42 scientific and 9 administrative staff. During the year 2018-19, the Institute has completed over 78 industry projects worth ₹15.43 crore which included three government funded R&D projects. Over 40% of the revenue budget of the Institute is earned as IEBR from industry sponsored projects. As a part of human resource development, NIRM organised two training programmes and six of its scientists attended various conferences abroad and presented their research papers.

8.23 Some of the major projects executed by the Institute during this year include In-situ stress measurements at a depth of 600m at mine of SCCL in Telangana for optimising the orientation of workings of upcoming underground mines for maximising production at greater depth; Safe excavation of about 3.5 Lakh cubic meter of hard rock for the Darlipalli STPP (Stage-I) of NTPC; Design modification from underground structure to creation of circular shaft from surface leading to substantial reduction in construction time and cost of Devadulla lift Irrigation

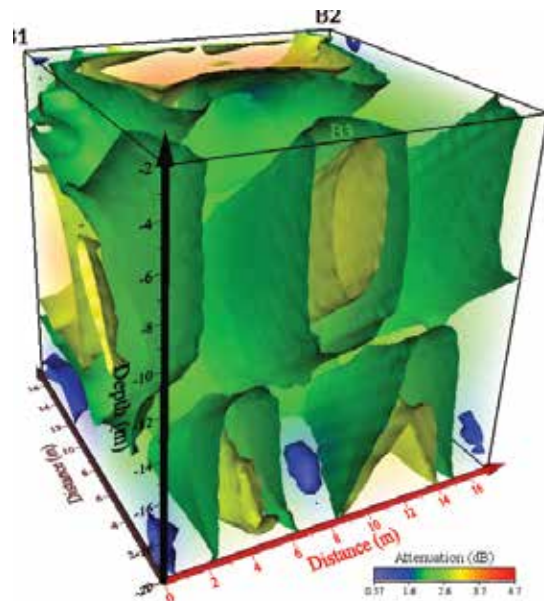


Fig. 3 : 3D tomography for locating buried archaeological monastery structure at Vadnagar, Gujarat

scheme, Warangal, Telangana; 3D Modelling (incorporating Shear Zone and large cavity) for planning remedial measures for long term stability of caverns of Powerhouse Complex of PHPA-II, Bhutan; 3D GPR tomography for locating buried archaeological monastery structure at Vadnagar, Gujarat; Active fault studies conducted through trenching for seismotectonic evaluation at Jaitapur (Maharashtra); and Planning and Design of Instrumentation layout with the help of 3D Model for Powerhouse Complex of Phunatsangchu-II project, Bhutan.

National Institute of Miners' Health (NIMH)

8.24 National Institute of Miners' Health, an autonomous Institute under Ministry of Mines, conducts applied research in the field of occupational health and hygiene among persons employed in mining and mineral based Industry with the vision of "Safe Mines and Healthy Miners" and the mission "Indian mining and mineral industry sans occupational diseases". The Institute

is recognized as a Scientific & Industrial Research Organization by the Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India. The Institute has completed 27 years of service to the nation in conducting research and promoting occupational health & hygiene among mine workers.

8.25 The institute has state of the art infrastructure, facilities and trained manpower to offer Technical Support Services;

8.26 The Institute provides services to both Private and Public sector mining companies viz. Reliance Industries, Ambuja Cements Ltd., NALCO, ACC Limited, UltraTech, NMDC, Essel Mining, Sesa Goa, GMDC, APMDC, RSMML, Western Coalfields Ltd. etc.

8.27 The main objectives of the Institute include:

- Promotion of health and prevention of diseases among persons employed in mines and mineral based industries.
- Research & development to ensure safe and healthy extraction of the country's mineral wealth.
- Assessment of health hazards in the work environment of mines and allied industries for regulatory and remedial measures.
- Develop human resources in the field of occupational health, hygiene and safety.

S&T Projects

8.28 The Institute has completed following two S&T projects

- (i) Multi Centric Study of dust Related Diseases in Stone Mines and Development of Sustainable

Preventive Programme. (In collaboration with Ministry of Labour & Employment)

- (ii) Possible implications of bio-available iron in coal mines dust on coal workers' lung disease. Project is in collaboration with National Institute of Miners' Health (NIMH) and Priyadarshani Institute of Engineering and Technology (PIET), Central India Institute of Medical Research (CIIMS) and Western Coal Fields Ltd. (WCL) (Sanctioned by Central Mine Planning and Design Institute (CMPDI), Govt. of India).

8.29 The Institute is implementing following two projects

- (i) Development of standard protocol of field Audiometry for notifying noise induced hearing loss (Sponsored by Ministry of Mines)
- (ii) Postural risk analysis of Mining equipment operators and its relation to Musculoskeletal Disorders. (Sponsored by Ministry of Mines)

National Mineral Exploration Trust (NMET)

8.30 The National Mineral Exploration Trust (NMET) was established by the Central Government through its notification dated 14th August, 2015 in pursuance of subsection (1) of Section 9C of Mines and Minerals (Development & Regulation) Amendment Act, 2015 with the objective to expedite mineral exploration in the country. The NMET Rules were also notified on 14th August, 2015. The holders of Mining Lease and Prospecting Licence-Mining Lease shall pay to the Trust, a sum equivalent to 2 percent of the royalty



paid in terms of the Second Schedule of the Act to the State Government, simultaneously with payments of royalty.

8.33 NMET has two-tier structure. The overall control, periodical reviews and policy directions of the Trust vest with the Governing Body (GB) and the Executive Committee (EC) is managing, administering and supervising the day to day activities of the Trust. The GB is chaired by Hon'ble Minister of Mines and the EC is chaired by the Secretary, Ministry of Mines.

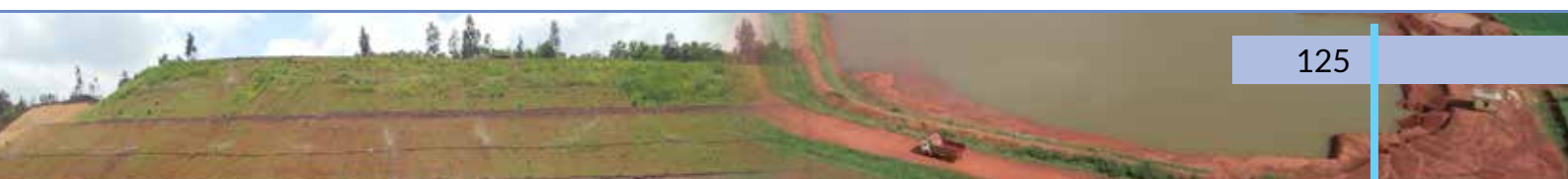
8.31 Besides, a Technical-cum-Cost Committee (TCC) has also been constituted to evaluate the technical as well as cost parameters of the project proposals submitted by the States and Notified Exploration Agencies for NMET funding. The TCC recommends the suitable proposals to EC for approval.

8.32 During the year, a total of 06 meetings of TCC and 04 meetings of EC were held and 86 mineral exploration projects were approved by the EC on the recommendation of TCC. Besides the Multi-sensor Aero-Geophysical survey programme, interpretation of Air-borne legacy data and Deep Seismic Reflection Survey (DSRS) and Magneto-Telluric (MT) Survey for Northern Transect of Project: Uncover of GSI are also being executed through NMET funding. Therefore, the projects amounting ₹ 46561.1 Lakh were approved under NMET funding.

8.33 It was decided that the NMET fund would be maintained in the Public Account

of India. Accordingly, the NMET Rules were modified and NMET (Amendment) Rules, 2018 were notified on 7th March, 2018 which stipulates that the State Government shall collect the NMET contribution in Public Account of the State and transfer the amount so collected to the Consolidated Fund of India. The total NMET fund accrued as on 31st March, 2019 is ₹1,44,737.77 Lakh. During the year, an expenditure of ₹ 8,839.65 Lakh has been incurred from the NMET fund.

8.34 A Workshop on "Accounting Procedure of the National Mineral Exploration Trust" was organized on 2nd and 4th May 2018 in Ministry of Mines on the new Accounting Procedure of the National Mineral Exploration Trust to describe the procedure of transfer of NMET contribution from States to Central Government and for smooth implementation of new accounting procedure. The representatives of fifteen States participated in the workshop. Also, a Workshop on "Enhancing participation of States in Mineral Exploration work" involving six States' Directorate of Mining & Geology (DMGs) and Mineral Development Corporations (MDCs) was organized at Hyderabad, Telangana on 8th October, 2018 in order to provide a platform to the State DMGs and MDCs to share their ideas and capacity in the field of mineral exploration. The representatives from the States of Andhra Pradesh, Chhattisgarh, Karnataka, Odisha, Tamil Nadu, Telangana and their MDCs participated in the workshop.





Stacked standard ingot





Corporate Social Responsibility

Corporate Social Responsibility

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- HCL Page - 130
- MECL Page -132

National Aluminium Company Limited (NALCO)

9.1 Periphery Development & CSR Initiatives

- CSR policy of NALCO is compliant with schedule -VII (section 135) of Companies Act 2013 and DPE Guidelines. The Company allocates 2% of average net profit of last 3 years as CSR fund as per Companies Act, 2013.
- Accordingly, For FY 2018-19, CSR fund allocation of the company amounts to ₹ 2,738.00 lakh.

9.2 Highlights on CSR activities for the financial year 2018-19 are furnished below:

1. PM's Iconic Shrine Development Programme: Shri Jagannath Temple, Puri

- 7 projects i.e. LED illumination of temple, thematic painting of both sides of the VIP road, Installation of clean water posts, establishment of open air theatre at slum dwelling, installation of hoarding signage, development of Gandhi Park completed.
- Battery-operated vehicle (EVs) service, free of cost, launched for senior citizens, differently-abled passengers and sick pilgrims from Jagannath Balav math to Jagannath temple at Puri.

2. Education:

- Indradhanush:** 920 tribal students from BPL families of periphery villages of Koraput district sponsored in 3 reputed residential schools in Odisha.

- NALCO-ki-Ladli:** Total 416 meritorious girl students of BPL category has been adopted as under 'Beti Bachao, Beti Padhao' programme, initiated by Gol as of FY 2018-19.
- The Company launched an innovative Employee Social Responsibility (ESR) programme on 01.01.2019 that offer employees a satisfying way to meaningfully contribute towards social causes by way of contributing ₹ 3000 each towards education of girl child under this scheme. The Company will match with equal grant for the same.



Providing Financial Assistance to NALCO ki Ladlis on 39th Foundation Day of NALCO (7 Jan 2019)

3. Health care:

- Door step health service:** More than one lakh patients of peripheral villages of Angul, Damanjodi & Pottangi sector treated by 8 Mobile Health units & 1 OPD every year. More than 1.5 Lakh patients treated in FY 2018-19.
- Support for rehabilitation of Divyangas:** First of its kind in the Country 7-Axis Robotics machine with in-built CAD/CAM Software installed by NALCO at SVNIRTAR, Gol, Olatpur (project cost of ₹ 2.73 crore) in Sep'18. This will enable

producing the orthotic and prosthetic sockets in a more efficient manner within less time, avoiding any adverse result on the nerve system of the users.

- c. A state-of-the-art Secondary Plus Eye Care Hospital inaugurated at Angul in association with LV Prasad Eye Institute (LVPEI). It will benefit more than 60,000 outpatients, perform 6000 surgeries annually and offer free treatment to poor patients. The ultra-modern hospital, which has been built at a cost of ₹ 25 crore, inaugurated by Hon'ble Union Minister, Petroleum & Natural Gas, Skill Development & Entrepreneurship on 18th Feb'19.
- d. A Night Shelter in AIIMS, Bhubaneswar for the needy is also being constructed.

4. ODF Village

6 villages are made Open Defecation Free (ODF) by providing 611 Individual household Latrines with water system in M&R Complex and in 5 Villages of S&P Complex the construction of toilets are continuing.

- 5. Drinking water supply to 26 water scarcity villages of Angul completed during FY 2018-19.
- 6. The CSR expenditure for FY 2018-19 is more than the mandated fund of ₹ 27.38 crore as per Companies Act 2013.
- 7. Towards empowering women, the Company provided mechanized Charkha to enhance their livelihood in Puri, Khurda and Koraput district of Odisha in collaboration with Khadi

and Village Industry Commission (KVIC).

- 8. Self Help Groups (SHG) strengthened and supported to engage in new income generation activities like mushroom farming in remote village of Pottangi block of Koraput district.
- 9. Solar lights installed in 8 remote villages of Koraput district in FY 2018-19 in addition to the previous 11 Villages.
- 10. 140 Schools in Varanasi are modernized with labs, computers, and classroom infrastructural support with a financial implication of ₹ 4.2 crore
- 11. Construction of road, culverts, community centers renovation and revamping of the water bodies have been undertaken in the periphery areas.

Hindustan Copper Limited (HCL)

Corporate Social Responsibility (CSR)

9.3 HCL embraces the principles of United Nations Global Compact (UNGC). HCL's CSR Policy revolves round the principles laid down in the Millennium Development Goals (MDGs) and Targets.



Cataract removal 100 Nos. per year in Collaboration with Purnima Netralaya, Jamshedpur, Jharkhand



Weekly visits of Specialist Doctors (Gynaecologist, Paediatrician, Urologist and Nuclear Medicine) in MCP.



Mobile Medical Unit in 19 villages in ICC.

9.4 The actual expenditure on the CSR activities during last two financial years and current financial year is given in the **Table 9.1**

Table 9.1
CSR expenditure during last two financial years and current financial year
(₹ in Lakh)

Financial Years	Required Spent (2% of average net profit (PBT) of last three FYs)	Spent
2016-17	371	515
2017-18	147	343
2018-19	170	210 (Provisional)

9.5 A detailed Plan for FY 2018-19 was prepared in alignment with The Companies

Act, 2013 and also considering the learnings from project implemented during FY 2017-18. The company allocated CSR Budget of 2% of the average net profits of the company made during the three immediately preceding financial years to the extent of 170.33 Lakh for FY 2018-19.

9.6 The projects are being implemented in the target communities with the help of NGO, state government and other agencies. Following CSR activities have been taken up during the year.

- i. Drinking Water, Health and Sanitation: Construction of Solar Mini Drinking Water Structures in ICC Ghatsila, Distt. East Singhbhum



Development of Puri as Swachh Iconic Place by NALCO

(Jharkhand), Supply of Drinking Water through Water Tankers for nearby villagers in Malanjkhanda Copper Project, Malanjkhanda, Distt. Balaghat (Madhya Pradesh) and Construction of Individual household toilets in ICC Ghatsila, Distt. East Singhbhum (Jharkhand).

- ii. Medical Services: Curative and Preventive health care facilities in surrounding villages through organizing Health Camps, Eye Camps and Mobile Health Vans in ICC, Ghatsila, Distt. East Singhbhum (Jharkhand) and in Malanjkhanda Copper Project, Malanjkhanda, Distt. Balaghat (Madhya Pradesh).
- iii. Education, Vocational Skills and Livelihood: Skill training through Kaushal Vikas Yojna at ICC, MCP & KCC and Skill Development Institute at Khetri, Rajasthan. Training on Hand Glove Making, Handloom and Wooden Craft making were undertaken.
- iv. Sports: Sports promotion through organizing Football and Cricket tournaments and training center for

Archery in ICC, Ghatsila, Distt. East Singhbhum (Jharkhand).

Mineral Exploration Cooperation Limited (MECL)

9.7 MECL has drawn a long term Corporate Social Responsibility Policy;

9.8 For the year 2018-19, an amount of ₹ 323 Lakh was proposed to be spent under Corporate Social Responsibilities. The detail for programme is as given below:

9.9 Under “Swatch Bharat Abhiyan”, a sum of ₹ 25 Lakh has also been contributed in “Swacch Bharat Kosh”.

9.10 MECL has contributed ₹ 25 Lakh under National Mission for Clean Ganga, an initiative of Ganga Rejuvenation.

9.11 For the welfare of Indian Armed Forces, MECL has contributed ₹ 50 lakh on Armed Forces Flag Day.

9.12 MECL has spent about ₹ 16 Lakh towards Health Care and ₹ 44 Lakh towards School Education which includes distribution of Computers, Furniture, Uniforms, Sports Kits, and School Bags etc. in and around MECL projects and establishments.



KCC Tailing Dam at night



A wide-angle, high-angle photograph of a massive open-pit mine. The mine is characterized by numerous terraced levels, with the most prominent ones in the foreground showing distinct horizontal layers of earth and rock. The terrain is rugged and brownish, indicating a dry or semi-arid environment. In the middle ground, several pieces of heavy machinery, including excavators and trucks, are visible on the various levels of the mine. The background shows more of the mine's extent, leading up to a range of hills under a clear, light blue sky. The overall scene conveys a sense of large-scale industrial activity and land modification.

10

**Progressive
Use of Hindi**

Progressive Use of Hindi

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Introduction

10.1 The Ministry of Mines continues to take steps to ensure compliance of the Official Language Policy of the Union in the Ministry of Mines as well as in its attached/subordinate Offices and PSUs. The compliance of Section 3(3) of Official Languages Act, 1963 is ensured. Letters received in Hindi are also replied to in Hindi.

Meeting of Hindi Salahakar Samiti

10.2 In order to propagate and review the progress of Official language in the Ministry of Mines as well as in attached/subordinate Offices and PSUs under its administrative control, Hindi Salahakar Samiti, a high-powered Committee under the chairmanship of the Minister of Mines has been constituted. In this meeting various measures to promote the use of Official language Hindi and to ensure the compliance of Official Language Policy are recommended. The last meeting of the committee was held on 19.06.2018 under the chairmanship of Shri Narendra Singh Tomar, Hon'ble minister of Mines. The meeting was attended by Members of Parliament and CMD's/Heads of various organizations/offices under the ministry along with senior officers of the ministry.

Meeting of Official Language Implementation Committee

10.3 The Official Language Implementation Committee (OLIC) has been constituted in the Ministry under the chairmanship of Economic Advisor. All Officers of the rank of Under Secretary to Director in the Ministry and also representatives of attached offices/organizations are members of the Committee. Quarterly Progress Reports received from the Sections of the Ministry and various issues of attached

offices/organizations regarding official language are reviewed in the meetings of the Committee and remedial measures are suggested to improve the progressive use of official language Hindi. Meetings of the Committee are being held regularly in each quarter. OLIC meeting for the quarter ending on 31 March, 2019 was organized on 29.03.2019.



Shri Anil Gopishankar Mukim, Secretary (Mines) welcoming Hon'ble Minister of Mines Shri Narendra Singh Tomar at Hindi Salahakar Samiti Meeting at Indore.

Official Language Inspections

10.4 In order to assess the progress made in the use of official language Hindi in attached/ subordinate Offices and Public Sector undertakings, under the administrative control of the Ministry of Mines; officers from Ministry, mainly from Rajbhasha Division conduct inspections of attached offices/organizations of the Ministry from time to time. During the year 2018-19 ministry inspected various offices of GSI, IBM, MECL, JNARDDC, NIMH situated at various places. Shortcomings noticed during the course of inspections are brought to the notice of the offices/officers concerned and measures to remove the shortcomings are also suggested.



Shri Narendra Singh Tomar, Hon'ble Minister and Shri Anil Gopishankar Mukim, Secretary (Mines) releasing short documentary of NALCO on Swachta at Hindi Salahakar Samiti Meeting at Indore.

Inspections by Committee of Parliament on Official Language

10.5 Committee of Parliament on Official Language conducts inspections regarding progressive use of Hindi in official work of various Offices, Undertakings, corporations etc. During the year 2018-19 the Committee visited offices of IBM, Hyderabad office, Taloja Copper project of HCL in Mumbai and NALCO Head office, Bhuvneshwar.

Website of the Ministry

10.6 The website of the Ministry serves as a vital link with the masses. The material on website is available in bilingual. Material available on website is updated from time to time by concerned sections.

Measures for Implementation of Official Language Policy

10.7 It is the policy of the Government to propagate the use of official language through inspiration and incentive. In order to inspire and encourage the officers/employees of the Ministry to work in Hindi, various Cash Award Schemes of the Department of Official Language have been implemented.

Training and Workshops

10.8 Under Hindi Teaching scheme of Ministry of Home Affairs, Department of Official Language, officers/employees are nominated for training in Hindi Language (Prabodh, Praveen, Pragya and Parangat) and Hindi stenography/typing by the Establishment section of the Ministry. In order to encourage officials/ employees to perform their official work in Hindi, Hindi workshops are also organized preferably



Meeting of Hindi Salahakar Samiti Meeting at Indore on 19th June, 2018.

alongwith meeting of official language implementation committee. One special workshop was organized for the officials in order to train them to work on e-office in Hindi.

Organization of Rajbhasha Fortnight/Month

10.9 In compliance of the instructions by Deptt. of Official Language, M/o Home Affairs and with an aim to create a conducive atmosphere for the progressive use of Official language in the Ministry, Rajbhasha fortnight/month is organized during September every year. This year also Rajbhasha Hindi Prayog Protsahan Month was observed from 1st to 30th September, 2018. A message by Hon'ble Minister of Mines, Shri Narendra Singh Tomar was

also circulated. Various competitions i.e. Hindi Noting/Drafting, Hindi Sulekh and Dictation, Quiz Competition, Hindi typing, extempore speech competition and Hindi



Shri Narendra Singh Tomar, Hon'ble Minister and Shri Anil Gopishankar Mukim, Secretary (Mines) releasing coffee table book of HCL during Hindi Salahakar Samiti Meeting at Indore.

workshop were organized during the month. In an event organized on 09.10.2018 the winners of the competitions were given cash awards and certificates by Dr. K.Rajeswara Rao, Additional Secretary (Mines).

Publication of 'Khan Sampada'

10.10 Ministry of Mines has been bringing out its Hindi in house journal 'Khan Sampada' since 1998. So far 37 issues of 'Khan Sampada' have been published successfully. Publication of 38th issue of Khan Sampada is being finalized and shall be published shortly.

Geological Survey of India (GSI)

10.11 Geological Survey of India (GSI) is an attached office of Ministry of Mines. Since its birth (1851AD) GSI is dealing with geo-scientific and technical activities of the country. GSI is also imparting state of the art training to the geo-scientists of the country and abroad with its Training Institute having Headquarter at Hyderabad

and RTI's. Despite being a scientific and technical organization, GSI is also engaged in promoting the use of Hindi in its various offices.

10.12 In compliance with the Official Language provisions in Indian Constitution, Official Language Act, 1963, Official Language Rules, 1976 and the instructions issued by the Government of India, Ministry of Home Affairs, Department of Official Language from time to time, Geological Survey of India is continuously implementing the Official Language Policies. Various works are carried out in the offices for the propagation of official language, various incentive schemes are implemented and progress in propagation of official language Hindi is also reviewed from time to time. Glimpses of official language related work done by GSI during the period from 01st April to 30th September 2018 are as follows:

In-house magazines

10.13 In-house Hindi magazine of GSI, CHQ, Kolkata '**BHOOMANTHAN**' 6th edition; RSAS, Bangalore '**VIHANG**' 9th edition; State Unit: Panjab, Haryana & HP, Chandigarh '**BHOOSANDESH**'; Western Region, Jaipur '**BHOOGAURAV**' 18th edition; State Unit: Jammu & Kashmir, Jammu '**TAVI**'; State Unit: Gujarat, Gandhinagar '**SABARMATI**' 2nd edition; GSI Training Institute, Hyderabad '**CHETANA**' 18th edition, State Unit: Jharkhand, Ranchi '**PARAS**' 3rd edition and Northern Region, Lucknow '**BHOOSANDESH**' were published during FY 2018-19. In addition to that, a special issue of the compilation of Hindi papers and articles of All India Scientific and Technical Seminar held at Kolkata in 2017 was also published. Publication of the compilation of abstracts

of technical papers in Hindi collected in All India Technical Rajbhasha Seminar held at NER, Shillong on 18.05.2018 has also published. Other Offices of GSI is also publishing their in-house magazines. Table Magazine “**BHUWAN**” has also been published during the period by GSI, NCEGR, Faridabad.

Implementation of Hindi Incentive Schemes

10.14 To promote the use of Hindi in the Official work the following Incentive schemes are being implemented in Geological Survey of India.

- Cash award and personal Pay to the Officers/ Employees for passing the Pragma, Praveen, Prabodh, Hindi Typing, and Stenography Examinations under the Hindi Teaching Scheme of Government of India, Ministry of Home affairs.

- Cash award to the Officers/ Employees for noting and drafting in Hindi.

Inspection of Various Offices

10.15 In order to assess the progress made in the use of Hindi in various offices, Op.WC-II, Kochi; ERO and SU: WB & AN, Kolkata; SU: J&K, Jammu, SU: T&M, Agartala; NRO and SU: UP, Lucknow; SRO, SU: AP, SU: Telangana and GSITI, Hyderabad were inspected by CHQ, Kolkata during FY 2018-19. Apart from this, various State units/operational units were inspected by Regional Headquarters of Geological Survey of India. Sections/ divisions of CHQ were also inspected during this period.

Hindi Workshop

10.16 The offices of Geological Survey of India are organising Hindi Workshop on regular basis as per the directives of



Prize distribution to the winners of the competitions organized by Ministry of Mines during Hindi Prayog Protsahan month, 2018.

Government of India, Ministry of Home Affairs, Department of Official Language. In this order, Hindi Workshops on various topics i.e. Hindi Typing on Computer through Indic Tools; Standard Hindi Spelling; Standard Devnagari Script; Hindi Spelling, Hindi grammatical errors and resolve; Official Procedure and Management; Constitutional provisions of Official Language; Use of Official Language in GSI offices; Incentives provided by Government of India in implementation of Official Language; Common errors of Hindi spelling; Provisions of Official Language and updated information; Office terminology; Unicode: Requirement and Utility; Hindi documents related to Vigilance and Disciplinary Action; Career scope in Hindi; Use of Hindi as Official Language; Use of Rajbhasha Module in OCBIS; Hindi Noting and Drafting; General knowledge of Hindi

Language; Hindi Typing on Computer; Use of Simple Hindi in official work; Use of Hindi in Finance related work; Useful software for Official Language Implementation; Use of Hindi in Day-to-day Office work, Hindi Typing through Speech to Text, etc. were organized by various offices of GSI in every quarter. Hindi Workshops at Central Headquarters, Kolkata were organized on 25.06.2018, 20.09.2018, 13.12.2018 and 11.01.2019

Portal of the GSI in Bilingual Form

10.17 As per the policy of the Government of India, necessary steps have been taken to make the web portal of GSI in Bilingual form. A sub-folder reflecting the activities of department pertaining to Hindi work in the department also made available in the portal. The work is in progress.



Hindi Prayog Protsahan month, 2018.

Hindi Fortnight/Week/Day

10.18 Hindi fortnight/week have been celebrated in all the Regional Headquarters, State Units, Operational Units of Geological Survey of India in the month of September. On 14th September, 2018 Hindi day was celebrated in the department in which the message of Honorable Minister of Home Affairs and Minister of Mines were read and the participants of Hindi fortnight were rewarded with prizes & certificates on 28.09.2018.

Hindi Translation

10.19 Gazette Notifications, Summaries, Office Orders, Circulars, Tender Notices, RTI Materials, Parliament documents send from the parliament cell and other correspondence of GSI have been translated English into Hindi and vice-versa have been released in bilingual format, thus fulfilling the requirement of Official Language Act, 1963 Section 3(3). In addition to that, Abstracts of reports related to various survey programs of the Geological Survey of India were also translated into Hindi.

Review of Quarterly Progress Report (QPR) of Regions

10.20 The review of Quarterly Progress Report (QPR) of all regions and Missions is carried out regularly and feedback is given regarding shortfall for necessary action.

Meeting of Official Language Implementation Committee

10.21 The meeting of Official Language Implementation Committee are being held in entire GSI offices as per the directive of Government of India, Ministry of Home

Affairs, Department of Official Language. The meeting of the Official Language Implementation Committee of the Central Headquarters was held on 26.06.2018, 17.08.2018, 17.12.2018 and 22.03.2019 during FY 2018-19.

All India Scientific & Technical Official Language Seminar

10.22 All India Scientific and Technical Official Language Seminar was organized on 18.05.2018 at North Eastern Region, Shillong, in which 27 research articles / articles were presented. Five research writers were also rewarded in the best three categories.

All India Annual Official Language Review Meeting

10.23 All India Annual Official Language Review Meeting was organized on 10-11 January, 2019 at Central Headquarters, Kolkata, in which the Annual Report of progressive use of Hindi for the year 2017-18 of all the offices of GSI were reviewed.

Participation in Town Official Language Implementation Committee (TOLIC)

10.24 Various offices of GSI participate in their respective TOLIC meetings and related activities. Op.WC-I, Manglore and GSITI, Hyderabad offices received Second and Third prize respectively for their contribution in progress of Official Language from their respective TOLIC. Central Headquarters, Kolkata have organized Official Language related competitions at the level of KOLTOLIC, Zone-IV from 26.11.2018 to 27.11.2018 and Apex level competition on 14.12.2018.

Indian Bureau of Mines (IBM)

10.25 Indian Bureau of Mines is implementing the policy of official language of the Govt. of India in the headquarters as well as all Subordinate offices of IBM very effectively. IBM has its headquarters at Nagpur, Maharashtra which falls in 'B' region. Six Subordinate offices of IBM fall in 'A', one Subordinate office in 'B' region and the rest of the 08 Subordinate offices fall in 'C' region. All the Subordinate offices of IBM have achieved all the targets mentioned in Annual Programme of the Department of Official language. During 2018-19, the details of the progress and achievement related to Hindi implementation are as follows :-

10.26 The 106th, 107th, 108th and 109th meetings of the Departmental Official Language Implementation Committee were held on 29.06.2018, 28.09.18, 31.12.18 and 29.03.19 respectively. In all regional offices, the meetings of the Departmental Official Language Implementation Committee are regularly held and reports are sent to the headquarters.

10.27 The Hindi Fortnight was successfully organised from 04.09.2018 to 14.09.2018. During the fortnight, various competitions such as Hindi Essay, Hindi Noting and Drafting, Hindi Translation, Hindi Typing, Hindi Extempore speech and Hindi Quiz were organised. The final day function of the Hindi Fortnight was organised on 14.09.2018 and prizes were distributed to the winners of the Hindi competitions.

10.28 'Hindi Diwas' was celebrated on the 14th of September, 2018. On this occasion, the messages of the Hon'ble Union Home Minister, Sri Rajnath Singh and Hon'ble

Minister of Mines Shri Narendra Singh Tomar were read out.

10.29 One day All India Hindi Technical Seminar was organised at IBM Headquarters, Nagpur on 19.04.2018. Total 14 technical papers have been presented and a souvenir had been released on this occasion.

10.30 IBM has also contributed to the Mining and Mineral Technical Glossary being prepared by the Ministry of Mines. IBM has constituted a committee under the chairmanship of Controller General. The committee has compiled about 1500 technical terms and has sent those to the Ministry for inclusion into the Glossary. In order to finalize the glossary, a symposium was organised from 27.08.18 to 28.08.18 at NALCO, Bhubaneswar where in it was finalised.

10.31 IBM Headquarters, Nagpur has got two official language Awards by the Town Official Language Implementation Committee (office-2), Nagpur. It has got the second prize for its Hindi House Magazine "Khan Bharti" and second prize also for the implementation of Hindi.

10.32 Hindi parangat and Hindi Typing Training : Hindi Parangat Training was organised at IBM Hqrs from Jan 2018 to May 2018 and from May to November 2018 in which 53 and 22 personnels were trained respectively. In the same way, Hindi Typing Training was organised from Feb. 2018 to July 2018 in which 15 personnel were trained. Examinations were also conducted in IBM Hqrs for this purpose. Almost all the candidates qualified the examination. At present Hindi Parangat training is being organised in which 25 personnel are being trained.

10.33 Under the rule 8(4) of the Official Language Rule 1976 of the Govt. of India, an Order has been issued individually for 73 officers and staff of Indian Bureau of Mines, Hqrs. Nagpur to do their official work in Hindi. Similarly, two subordinate offices of IBM i.e. COM (CZ) and Modern Mineral Processing Laboratory and Pilot Plant, Hingna, Nagpur have been notified under Rule 10(4) of the Official Language Rules, 1976. In this way, the total number of notified offices of IBM has reached up to 2019.

National Aluminium Company Limited (NALCO)

Progressive use of Hindi in Official Work

10.34 As per the Official Language Act-1963 and Official Language Rule-1976, implementation Hindi is being done in NALCO.

- To promote use of Hindi in official work, Hindi Fortnight observed at Corporate Office, Production Units and Regional Offices of the Company and several Hindi Competitions were organised for employees and students.
- A Hindi Hasya Kavi Sammelan with Hindi poets of national repute organised at Damanjodi & Bhubaneswar.
- Mobile apps "NISARG" for Corporate Social Responsibility & "Namasya" for MSME was launched in Hindi.
- A Hindi musical Video clip "Amritam Gamaya" released to spread the awareness on "Swachha Bharat Abhiyan".

- Meetings of the Town Official Language Implementation Committee held at Angul & Bhubaneswar.
- Three Hindi workshops organised and employees and officers were trained to do official work in Hindi.
- Hindi Training was provided to the employees who do not have working knowledge of Hindi. 28 Employees passed Pragya course under Hindi Teaching Scheme of Government of India and incentives were awarded to them as per rules.
- Website of Company made Bilingual and being regularly updated both in Hindi and English.
- Inspection regarding implementation of Hindi was Corporate Office conducted by Committee of Parliament of Official Language in Sep'18. Rajbhasha Inspection of Eastern Regional Office, Kolkata was conducted by Assistant Director (Implementation), Deptt. of Official Languages, Kolkata in Mar'19.

Hindustan Copper Limited (HCL)

10.35 During the year 2018-19, HCL made constant endeavor to increase use of Hindi in its Units/Offices. Raj Bhasha Pakhwara and Hindi Diwas were celebrated in the Units/Offices from 14th to 28th September, 2018. The messages of Hon'ble Home Minister and Hon'ble Minister of Mines, Govt. of India and CMD, HCL were circulated/read out in all Offices/Units on this occasion. Various competitions were organized with a view to enhance interest among employees towards Official Language. Prizes were distributed to

the winners. Employees are constantly motivated to use Hindi in their day-to-day official work. Hindi Workshops were conducted in the Units/ Offices at regular intervals. Regular review of progressive use of Hindi and difficulties faced were carried out in Quarterly meetings of Official Language Implementation Committee under the Chairmanship of CMD at Corporate Office and Unit Heads in Units.

10.36 During the year 2018-19, the Company participated in the half-yearly meeting of Town Official Language Committee (PSUs), Kolkata held on 24th August, 2018. HCL has received the 'Protsaahan Puraskar' and "Best Performance Award" by Town Official Language Committee (PSUs), Kolkata for successfully implementation for official language under "Rajbhasha Award Scheme-2017-18".

10.37 The progressive use of Hindi is being reviewed regularly at the Board meetings of Company. During the year, books worth ₹ 43,000 were purchased, in which Hindi books of ₹ 28,000 have been purchased. The Company's in-house journal "Tamralipi" is published in Hindi and English and distributed among employees regularly and also mailed to the members of the Hindi Advisory Committee. Advertisement of company recruitment / tender etc. is also published bilingual. "One Hindi Word Every Day" scheme is operational for improving the Hindi vocabulary of employees. The Hindi translation of Annual Report, MoU, Outcome Budget, Annual Report of Ministry of Mines and various other jobs of the Company were done.

Mineral Exploration Cooperation Limited (MECL)

10.38 As per the orders of Ministry of Home Affairs, Rajbhasha Vibhag, Unicode Encoding 'Samarthit' font has been installed in all computers & Laptops in MECL, so that more officials are able to work in Hindi due to its easy functionality.

10.39 In accordance with the policy of Govt. of India for extensive use of Hindi in official work, all our efforts were continuously made for increasing the use of Hindi during the year 2018-19. Hindi Diwas/Pakhwada was organised from 01.09.2018 to 15.09.2018, wherein, various competitions were organised for employees to propagate Hindi amongst them. Four Hindi workshops were organised during the year 2018-19, Four quarterly meetings of the Official Language Implementation Committee of MECL were held, In order to encourage employees to do official work in Hindi, 203 cash awards were given to employees during the year 2018-19.

10.40 MECL also successfully organised a Hindi translation competition on 17.09.2018 for all officials of Nagpur based Govt. offices under the guidance of Official Language Implementation Committee. The in-house magazine of MECL "MEC SAMACHAR" received First Prize in the month of March 2019 under 'News Letter' category by Nagar Rajbhasha Karyanvayan Samiti (NARAKAS) under Ministry of Home Affairs, Nagpur and also got Consolation prize for encouraging implementation of Official Language,



"MEC Samachar" received First Prize under News Letter category of Nagpur City"

Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC)

10.41 JNARDDC continued its efforts to promote the progressive use of Hindi. The Centre celebrated Hindi Pakhwada during 14-28 September 2018 which included several competitions. Director, JNARDDC emphasized the need for further use of Hindi in day to day official use of the Centre's activities. A workshop on Hindi was conducted under the able guidance of Dr.Sompal Singh in June 2018. Inspection of JNARDDC was carried out by Director (Official Language), Ministry of Mines on 8th March 2019.

National Institute of Miners' Health (NIMH)

Celebration of Hindi Pakhwada

10.42 Staff and Officers of NIMH at Nagpur and KGF branch enthusiastically celebrated 'Hindi Pakhwada' from 14th September to 1st October, 2018 for the enrichment of Hindi language throughout the society and the Institution. Several programs like Sangoshti, Quiz session, etc., were conducted during 'Hindi Pakhwada'.

Exploration Activities in the North-Eastern Region

Exploration Activities in the North-Eastern Region

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- Landslide hazard studies Page - 150
- Work done by IBM in North-Eastern Region Page - 150
- Work Carried Out by MECL in North Eastern Region. Page -151

Introduction

11.1 The North Eastern Region has a unique geomorphological and geological setup. It consists of eight states with spectacular Himalayan Ranges, massif plateau and alluvium plains of Brahmaputra River. The rocks ranging in age from Precambrian to Recent age are exposed here. This part of the country attains significance with the presence of mighty Himalayan Mountain Belt in the north; Shillong Massif Plateau in the south and gorgeous Brahmaputra valley forming the extensive Assam plain in between and Indo-Myanmar Range in the east.

Review of Progress of Ongoing Projects in North-Eastern Region

11.2 GSI is relentlessly working for the development of the North Eastern Region (NER). To intensify GSI's activities in NER an office was set up at Shillong in 1961 which was a quantum leap for accelerating the activities on mapping and mineral assessment in Assam, North East Frontier Agency (NEFA), Nagaland, Manipur and Tripura. Since then with the changing need of the country and in conformity with the laid down policies of Government as envisaged under policies of Niti Aayog, GSI is continually striving for the development of NER states through augmentation of baseline geological data, natural resource assessment, addressal of societal issues (involving geotechnical, seismic, landslide studies), publication of maps, literatures, geo-spatial data base and helping the states of NER in training, capacity building, technical and scientific assistance.

Work done by Geological Survey of India (GSI) in North Eastern Region:



Aluminium Refinery

MISSION: I (Baseline Geoscience Data Generation)

Survey & Mapping

Regional Survey

Specialised Thematic Studies (Scale: 1:25 K)

11.3 During FS 2018-19, total nine items of Specialized Thematic Mapping including two RP items have been taken up in North Eastern Region of which one item taken in Arunachal Pradesh, two items in Assam, three items in Meghalaya, one item in Manipur-Nagaland and two items in Tripura-Mizoram and an area of about 1618 sq. km (STM) and 220 I km (RP) have been covered till March 2019.

Geochemical Mapping (GCM)

11.4 Total fifteen items of Geochemical Mapping on 1:50,000 Scale with collection of samples in grid pattern have been taken up during the F.S. 2018-19 in parts of Arunachal Pradesh, Assam, Nagaland and Meghalaya and an area of 10,617 sq. km has been covered till March 2019.

Geophysical Mapping (GPM)

11.5 Two items of Gravity-magnetic mapping in Hojai, Karbi-anglong and Kamrup districts, Assam have been taken



Loco garage in KCC mine

up during FS 2018-19 and an area of 2800 sq. km have been covered till March 2019.

Mission II: Natural Resource Assessment (Mineral Exploration)

11.6 Introduction: During FSP 2018-19, a total of 20 items (12 G4 and 8 G3 stage) have been taken up under Mission-IIA and Mission- IIB. Out of 20 items, 19 items of Mission-IIA (Mineral Resource Assessment) have been taken up in the states of Arunachal Pradesh, Assam, Meghalaya, Nagaland and Manipur and 1 item of Mission-IIB (Natural Energy Resources) is in Mongchen, Dibua, Waromong and Molungyimsen area of Mokokchung District, Nagaland.

Mission: III Geoinformatics (Dissemination of Information)

11.7 During the period from April, 2018 to March 2019 the following activities were taken:

- Publication of Records of GSI- Vol. 152, Part 4 (Extended Abstracts of progress reports of the Field Season 2017-18 of NER) is completed and tendering initiated for printing and under Publication of Misc. Pub. No. 30 Pt IV, Vol. 2 (II) (Geology and Mineral Resources of Meghalaya), 3rd edition, manuscript and map completed and submitted to PID for approval.
- Creation of geodatabase on 1:25000 scale: Attributes for 54 Nos. of toposheets viz., have been incorporated in geodatabase after consulting reports of Specialised Thematic Mapping projects of Meghalaya, Assam, Tripura & Mizoram and Arunachal Pradesh.
- Compilation, Updation, Editing, and Finalisation of 2nd Edition of Geology and Mineral Maps of NER on 1:2M and state map of Arunachal Pradesh of NER on 1:1 M scale and Uploading



on to GSI Portal: Compilation of both the maps were completed and first drafts were sent to Map Division, CHQ for scrutiny.

- Preparation of Geological Quadrangle Map of Degree sheet 83G: The generalization of lithology and structural layers as per the standardized legend has been completed. Administrative layers viz., road and drainage layers are digitised. Composition of the map on 1:250,000 as per the standard template are in progress.
- Preparation of Geological Quadrangle Map of degree sheets 83M, 83N, 91H and 92E on 1:250,000 scale based on 50K geological database uploaded to the GSI portal: Compilation of degree sheet 83M, 83N, 91H and 92E have been completed and presently under scrutiny at M&C Division, Shillong.

Mission: IV Fundamental & Multidisciplinary Geosciences and Special studies (Specialized Investigations)

Palaeontological Studies

11.8 During FS 2018-19, Study of the Palaeobiology of mega-invertebrates across K-Pg transition in Meghalaya shelf and the palaeoenvironmental implication' has been taken up in and around Amlarem, Amlari Quarry and Syndai, West Jaintia Hills District and around Lyndem and Pongtung, East Khasi Hills District, Shillong. An area of 42 sq km on 1:50,000 scale has been covered. 'The Sylhet sandstone of Shella Formation (Lakadong sandstone) was exposed around Jarain and Amlarem. Around Syndai, bivalves were collected from a carbonaceous shale unit (Lakadong sandstone?).

Geotechnical investigations

11.9 NER may be termed as the 'power house' of India as it possesses hydropower potential, which is about 30% of the total hydel potential of the country. The hydel potential of major river basin of Arunachal Pradesh like Kameng, Subansiri, Siang, Lohit and Dibang totals production of 34,920 MW at 60% load factor (CEA) i.e. about 90% of the total hydropower resources of NER.

11.10 GSI, NER is intimately associated with the development of hydel power in North-Eastern Region conducting geotechnical studies at various stages of geotechnical investigation to identify suitable sites for locating dams, powerhouses, selecting tunnel alignments and suggesting remedial measures during construction. Besides Hydro Electric Project, GSI also carried out geotechnical investigation of various transport and communication projects such as Sela Pass Tunnels, Gangtok-Sherathang-Nathula Highway (JNM Road) and Jiribam-Imphal Broad Gauge Railway Line (NFR).

11.11 During the current field season 2018-19, Engineering Geology Divisions, GSI, NER, Shillong has taken up the following three Geotechnical Investigation projects;

- Umri-Umsiang Irrigation project in Ri-Bhoi District, Meghalaya.
- Selim Hydro Electric Project, West Jaintia Hill District, Meghalaya
- Mawblei HEP, West Khasi Hill District, Meghalaya
- Myntdu- Leshka stage-II HEP, Jaintia Hill District, Meghalaya
- Preliminary geotechnical assessment of the proposed OTM ACCN for 305

FD Hospital Military Engineering Service (MES) at TeliTawang, Tawang District, Arunachal Pradesh.

- Geotechnical investigation for slope stability in the landslide prone area along realigned portion of the road portion of Ongsteng Umblai Mawphuroad, Meghalaya.

Landslide Hazard Studies

11.12 In North-Eastern Region, 15 standard items under the National Landslide Susceptibility Mapping programme are being taken up during FS 2018-19. In addition, 3 Meso-scale and 1 Site specific landslide studies are being taken up.

Earthquake Studies

11.13 Three regular items have been taken up in NER on seismic and earthquake studies in FS 2018-19. The Level B Seismic Microzonation is being taken up which involves integrated studies of seismic source, seismic response through geological, geotechnical and geophysical parameters and their relation to seismic susceptibility following guidelines of GSI, 2017. Monitoring of Ground Motion in Brahmaputra Basin, Naga Patkoi and NE Himalaya with the objective to generate and process data for long term monitoring of the ground motion in the selected parts of Brahmaputra basin, Naga Patkoi range & northeast Himalaya and to delimit the boundaries especially southern and eastern boundaries of the micro plate breaking off from the Indian plate.

Fundamental Geoscience

Petrological Studies

11.14 Two Research items i.e.

‘Petrological characterization of the felsic volcanics and volcanoclastics as well as of the basic volcanics and intrusives within Shillong Group of sediments of Meghalaya’ and Petrological studies of the Higher Himalayan Crystallines along Yinkiong-Tuting and Monigong-Tato-Menchuka sections of Arunachal Himalaya have been taken up. The work is in progress.

Climate Change

11.15 One item on climate change study i.e. ‘Deglaciation history of TistaKhangse Glacier, North Sikkim District, Eastern Himalaya, Sikkim’ has been taken up. Field based component of 40 sq. km area has been validated and 10 nos. samples (OSL) are collected and studied for determination of sediments.

11.16 Budget and Expenditure of the Northeast Region for the Financial Year 2018-19 (Allocated Plan Outlay for NER) is given in the **Table-11.1**

Work done by Indian Bureau of Mines (IBM) in North Eastern Region

11.17 The Regional Office of IBM at Guwahati continued to undertake inspection of mines and studies on development of resources in North-Eastern Region. During the year 2018-19 30 mines / areas were inspected for enforcement of provisions of MCDR, 2017 and for processing and disposal of mining plan/scheme of mining.

11.18 Based on the proposals received, two day workshop cum training programme on filing of returns under rule 45 of MCDR 2017 was organized on 1st and 2nd November 2018 at Kolkata. Course module in this regard was devised as per specific

Table 11.1
Budget and Expenditure of the Northeast Region for the Financial Year 2018-19
(Allocated Plan Outlay for NER)

(₹ in Lakh)

S. No.	SCHEMES	BE 2018-19	RE 2018- 19	Expenditure from April 2018 to March 2019 *
1	Survey & Mapping	70.00	70.00	87.00
2	Mineral Exploration	135.00	135.00	193.00
3	Special Investigation	30.00	30.00	34.00
4	R & D	38.00	38.00	44.00
5	Information Dissemination	105.00	105.00	134.00
6	Human Resource Development	15.00	15.00	10.00
7	Modernization & Replacement	140.00	140.00	131.00
8	TSP	0.00	0.00	163.00
	Administrative Support Activities	5167.00	5167.00	5282.00
	Total	5700.00	5700.00	6078.00
	% utilization of budget against RE			106.63%

* Expenditures beyond the allocated RE grant of NER have been made from the RE grant of GSI (excluding NER).

requirements. In this training 04 persons from NE region have also participated.

Work Carried Out by MECL in North Eastern Region

11.19 MECL has been associated with mineral exploration activities and geo-technical studies for the development of mineral industry in the North Eastern Region since 1977. It has completed exploration for coal in 15 blocks in the states of Assam, Arunachal Pradesh, Nagaland and Meghalaya on behalf of Ministry of Coal, North Eastern Council and CMPDIL. Under its promotional programme funded by Ministry of Mines, it has completed twelve schemes which include copper, sillimanite, glass sand, shell limestone and ferro-silicon grade quartzite in the states

of Assam, Meghalaya, Nagaland, Mizoram, Sikkim and Arunachal Pradesh. In addition, it has carried out geo-technical studies on behalf of Brahmaputra Flood Control Board in the state of Assam and Arunachal Pradesh and consultancy work for remote sensing studies at Tripura on behalf of Ministry of Mines. Exploration services were also rendered to Atomic Minerals Division involving survey, drilling & mining in Umarangaon / Domiaset block, West Kasi Hill district.

11.20 On behalf of Directorate General of Hydrocarbon, Govt. of India, MECL with BRGM France has completed studies for resource estimation in respect of oil shale deposit in an area of 254 sq.km. of Assam & Arunachal Pradesh.



Systemic Rice Intensification in villages around ICC



**Welfare Activities for SCs/STs,
Women, Minorities & Persons
with Disabilities.**

Welfare Activities for SCs/ STs, Women, Minorities & Persons with Disabilities.

- Ministry of Mines Page - 155
- Geological Survey of India (GSI) Page - 155
- Indian Bureau of Mines (IBM) Page - 156
- National Aluminium Company Limited (NALCO) Page - 156
- Hindustan Copper Limited (HCL) Page - 158
- Mineral Exploration Cooperation Limited (MECL) Page - 159
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- National Institute of Miners' Health (NIMH) Page - 160

Welfare of Scheduled Castes (SCs), Scheduled Tribes (STs), Women and other Weaker Sections

Ministry of Mines

12.1 The Ministry of Mines, with its attached office, subordinate office and the Public Sector Undertakings under its administrative control follow the Government guidelines with regard to welfare of weaker sections of the society, in letter and spirit. For upliftment of weaker sections of society, PSUs identify and implement a number of programmes in the peripheral area of their units/locations.

12.2 A number of activities like community education programmes, facilitating availability of drinking water, development/repair of approach roads of surrounding areas, arranging health awareness programmes and medical camps in rural areas were undertaken by the PSUs for upliftment of the community in and around their townships as part of their social responsibility.

12.3 For the welfare of SC/STs, OBCs and PwDs, Liaison Officers have been appointed.

Women's Welfare

12.4 An internal Complaints Committee (ICC) under chairpersonship of Smt. Reena Sinha Puri, JS&FA has been constituted to look into cases of sexual harassment of women at work place in the Ministry.

12.5 Ministry of Women & Child Development has developed an online complaint Management System titled Sexual Harassment electronic -Box (SHe-Box) (www.shebox.nic.in) to receive complaints related to Sexual Harassment at workplace. Once a complaint is submitted

to the SHe-Box, it will directly go to the ICC of the concerned Ministry which has the jurisdiction to inquire into the complaint. The Chairperson of Internal Complaints Committee (ICC) of this Ministry monitors the progress of inquiry conducted by ICC on the sexual harassment complaints received from women employees of this Ministry.



SHe-Box online complaint management system

Geological Survey of India (GSI)

12.6 The Geological Survey of India (GSI), an attached office of Ministry of Mines, has undertaken a number of activities for the welfare of Scheduled Caste (SC) / Scheduled Tribe (ST), Other Backward Class (OBC), personnel with disabilities (PwD) and other weaker sections of the Society.

12.7 Measures were undertaken for officials belonging to SC, ST, OBC and PwD communities @15%, 7.5%, 27% and 4% respectively against vacancies reserved for them as per order issued by the Govt. of India/MoM/DoPT from time to time. In GSI, reservation has been followed strictly in case of their employment/promotion wherever applicable.

- SC/ST cell has already been established in Central Headquarters as well as in the respective Regional offices of GSI under supervision of the Liaison Officer (LO) belonging to

SC/ST category to address difficulties faced by these communities and also to initiate appropriate measures for resolving their issues. The LO, SC/ST, CHQ accords his concurrence to fill up vacancies before conducting DR and promotion after verification of the Reservation/Register placed by the concerned personal wing at the time of submitting DR/promotion proposals. The Regional LO, SC/ST also accords concurrence in the regional matters wherever applicable.

- As per the available records, the total strength of employees in GSI as on 28.02.2019 is 6307 (Gr - A to MTS) out of the total Sanctioned strength of 12189 wherein, the reservation position of the existing strength is SC-1238, ST-631, OBC-1261 and PwD-96.
- The Liaison Officers (SC/ST) meeting is being held regularly once in a year for discussing various issues related to SC/ST grievances and to take appropriate actions accordingly.
- Quarterly meetings between the authority and the office bearers of 'All India GSI SC/ST Employees Welfare Association' are also conducted periodically to redress the grievances of GSI SC/ST employees. Last quarterly meeting was held at GSI, CHQ, Kolkata on 30.05.2018 under the chairmanship of the DG, GSI.

Indian Bureau of Mines (IBM)

Welfare activities for SC/ST, women, Minorities and PwD's:

12.8 IBM is strictly following the various instructions of the Government issued from time to time regarding reservation of

vacancies for PwD's in respect of Group 'A' and 'B' Gazetted posts. As on 31st March 2019, 13 physically handicapped persons were under employment in IBM.

12.9 A committee under sexual harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013 has been constituted in IBM to redress the complaints made by the victim of sexual harassment at work place in a time bound manner.

12.10 Women employees constitute about 12.00 per cent. Training is imparted to women employees in the field of technical as well as administrative matters.

National Aluminium Company Limited (NALCO)

12.11 Welfare of activities for SCs/STs, Women, Minorities and Persons with Disabilities.

- The Presidential Directives issued from time to time on reservation of SC/ST persons in employment has been scrupulously followed by the Company. There are exclusive Cells constituted for the welfare of the SC/ST employees which meet and discuss their view points at regular intervals both at Complex level as well as corporate level.

12.12 The following concession / relaxations are given to SC/ST candidates in the matter of direct recruitment.

- (a) Age relaxation of 5 years.
- (b) Exemption from payment of application fee.
- (c) Re-imbursment of travelling expenses for attending both written test and interviews.

- (d) Relaxation of experience up to one year.
- (e) Relaxation in qualifying marks for eligibility
- (f) Relaxation of 10% marks both in written test and interview (for posts requiring interview).
- Relaxation/concession in Promotions- Relaxation of 10% of marks both in written test and interview is given to SC/ST employees in promotion up to lowest rung of Group-A.
- 10% reservation in A & B type quarters & 5% in C, D & E type quarters is given to SC/ST employees in allotment of residential quarters.
- Liaison Officers have been appointed for each of the units for implementing the Presidential Directives as well as to look after the welfare of SC/ST employees. SC/ST Cell have also been constituted under the control of the respective Liaison Officers to ensure prompt disposal of grievances and representations of SC/ST employees.
- 20% of the scholarships are reserved for the children of SC/ST employees under Nehru Memorial Scholarship awarded to the children of NALCO employees along with relaxation of 10% in marks.
- Invariably in all the Selection Committees/Boards for recruitment and the Departmental Promotion Committees for promotion, an officer from SC/ST category of appropriate status is included as one of the members in order to take care of the interest of the SC/ST candidates.

12.13 Minority Welfare

- A member of the minority community is associated in the Selection Committees for Recruitment in order to give a fair deal to the minority community. Advertisement to fill up the vacancy position is notified in regional languages in order to encourage the minority candidates about recruitment especially in Group- 'C' & 'D' posts.

12.14 The Persons with Disability

- The Company has been making efforts to achieve representation of PwDs (Divyangs) in all posts in Group: A, B, C & D as per Section -34 of the Rights of Persons with Disabilities Act, 2016. From 19th April 2017 onwards, 4% of vacancies are being reserved for persons with disabilities as provided in the Act. As on 31.03.2019, there are 95 persons with Disability in employment of the Company in various identified posts. Facilities are being developed under the 'Access India Campaign'. An 'Equal Opportunity Policy' as required under the Act has been formulated in consultation with NGO, NIRTAR and Employees and the same has been widely circulated in addition to web-hosting.

12.15 Perspective Plan for Women Welfare

- The Company has adopted the principle of equal opportunity to the women employees in the matter of employment and the Company has 359 nos. of women employees at different levels and categories.
- The ladies clubs in all units have extended necessary assistance for carrying out their various activities which in turn enhances their leadership and organizing capabilities in addition to welfare of the society.

12.16 Employment in the Company of SC/ST/Ex-SM/PwD/LDP/Minorities as on **31.03.2019:**

Group	Total No. of Employees	SC	ST	EX-SM	PwD	LDP	Minority
Executives	1737	255	144	1	19	27	69
Non-executives	4621	782	1036	12	74	1664	168
Trainees	138	27	19	1	2	54	6
Total	6496	1064	1199	14	95	1745	243
		2,286					

It may be seen from above that every third employee of the organization belongs to SC or ST Community.

Hindustan Copper Limited (HCL)

Welfare Activities

- Employees Participation in Management**

12.17 Employees Participation in Management over the years has been the backbone of harmonious Industrial Relations in the Company. The successful operation of various Bi-partite forums at all three levels, namely, at the Apex level, Unit level and Shop floor level has immensely contributed in the smooth performance of the Company. Quality Circles which were introduced in all the production units of the company have been successfully functioning and contributing towards reduction of cost and increasing productivity.

- Perspective Plan for Women Welfare**

12.18 In pursuance to the judgment of the Supreme Court, HCL has set up Committees in all the Units/Offices of the company for the prevention of sexual harassment of women in work place. A provision in this regard has also been incorporated in

the Conduct, Discipline and Appeal Rules of HCL. During the year under report, one incidence of discrimination amongst employees on the basis of gender has come to light which has been resolved.

- Representation of SC/ST and OBC**

12.19 The representation of SC, ST and OBC employees out of the total manpower of 2195 as on 31.03.2019 is 17.77%, 13.58% and 14.26% respectively.

- Other Welfare Measures**

12.20 The retired employees of the Company and their spouse are extended medical treatment at the Company's Hospitals at the Projects. Company also extends support to 'Mahila Samity' and other institutions / NGOs in their endeavor to run 'Health Camps' for the local population under CSR programme.

12.21 In the townships of the Company located at Khetri, Malanjkhand and Ghatsila as well as in other places of work, the employees of different caste, creed, religion, live together and celebrate all religious festivals with pomp and gaiety.

12.22 The Company maintains Cultural Clubs for the employee at all the production Units.

The status of implementation of the persons with disability act, 1995.

12.23 The number of physically challenged persons employed in the Company as on 31.03.2019 is as given in **Table 12.1**.

Table 12.1
The number of physically challenged persons employed in the Company as on 31.03.2019

Group	Number of Persons with Disabilities (PwDs)
A	11
B	4
C	4
D	6
Total	25

Mineral Exploration Cooperation Limited (MECL)

12.24 The category wise employment position including General /SC /ST / OBC /Minorities /Women (As on 31.03.2019) in the company is given in **Table-12.2**.

Table - 12.2
Employment of Personnel as on 31.03.2019

Group	Total No. of employees	General	SC	ST	O.B.C	Minority	Women
A	292*	176	36	14	66	12	22
B	21	14	05	01	01	01	01
C	712	348	139	48	177	26	32
D	-	-	-	-	-	-	-
Total	1025*	538	180	63	244	39	55

* Including functional directors.

12.25 Welfare of SC/ST: MECL gives due importance to meet socio-economic needs of the SC and ST employees of the organisation.

Women and weaker sections

12.26 Being a CPSE, MECL is committed for raising and improving the socio-economic status of women and weaker sections of the society. For this purpose, under the CSR activities during 2018-19, the company has distributed cycles and sewing machine for women and weaker sections.

12.27 MECL is an equal opportunity employer for women employees where the service rules are uniformly applicable to both male and female employees. The company is successfully running its crèche facility. The women employees in the Company are provided Maternity benefits as per rules.

12.28 Laws relating to protection of dignity and safety of women in the workplace are being adhered to. The ratio of male to female employees turned out to be 18:1 in the financial year 2018-19 (data as on 31.03.2019)

12.29 The company has in place an Anti-Sexual Harassment policy in line with the

requirements of the Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013. Internal Complaints Committee (ICC) has been set up to redress complaints received regarding sexual harassment. All employees (permanent, contractual, temporary, trainees) are covered under this policy. Number of complaints received is nil and number of complaints disposed off is nil as on 31.03.2019. A sensitisation programme on Sexual Harassment of Women at Workplace was also organised during the year.

12.30 In line with the Rights of Persons with disability Act, 2016 (R PwD Act, 2016), MECL has implemented Equal opportunity Policy as per directive of Ministry of Social Justice & Empowerment.

Jawaharlal Nehru Aluminium Research Development and Design Center (JNARDDC)

12.31 The Centre is following the various government guidelines w.r.t PWD, SC & ST reservation. Recruitment of one OH category persons was completed.

National Institute of Miners' Health (NIMH)

Women

12.32 The Institute is following all the standard guidelines & policies issued by Govt. / Ministry towards the woman employees. Dr. Shubhagi Pingle, SRO has been nominated as nodal officer to handle the grievances of the woman employees & till date the Institute has not received any grievance from any woman employee.

SC/ST

12.33 The Institute is following all the standard guidelines & policies issued by Govt. / Ministry towards the SC/ST employee's reservation in recruitment. Till date the Institute has not received any grievance from any SC/ST employee.

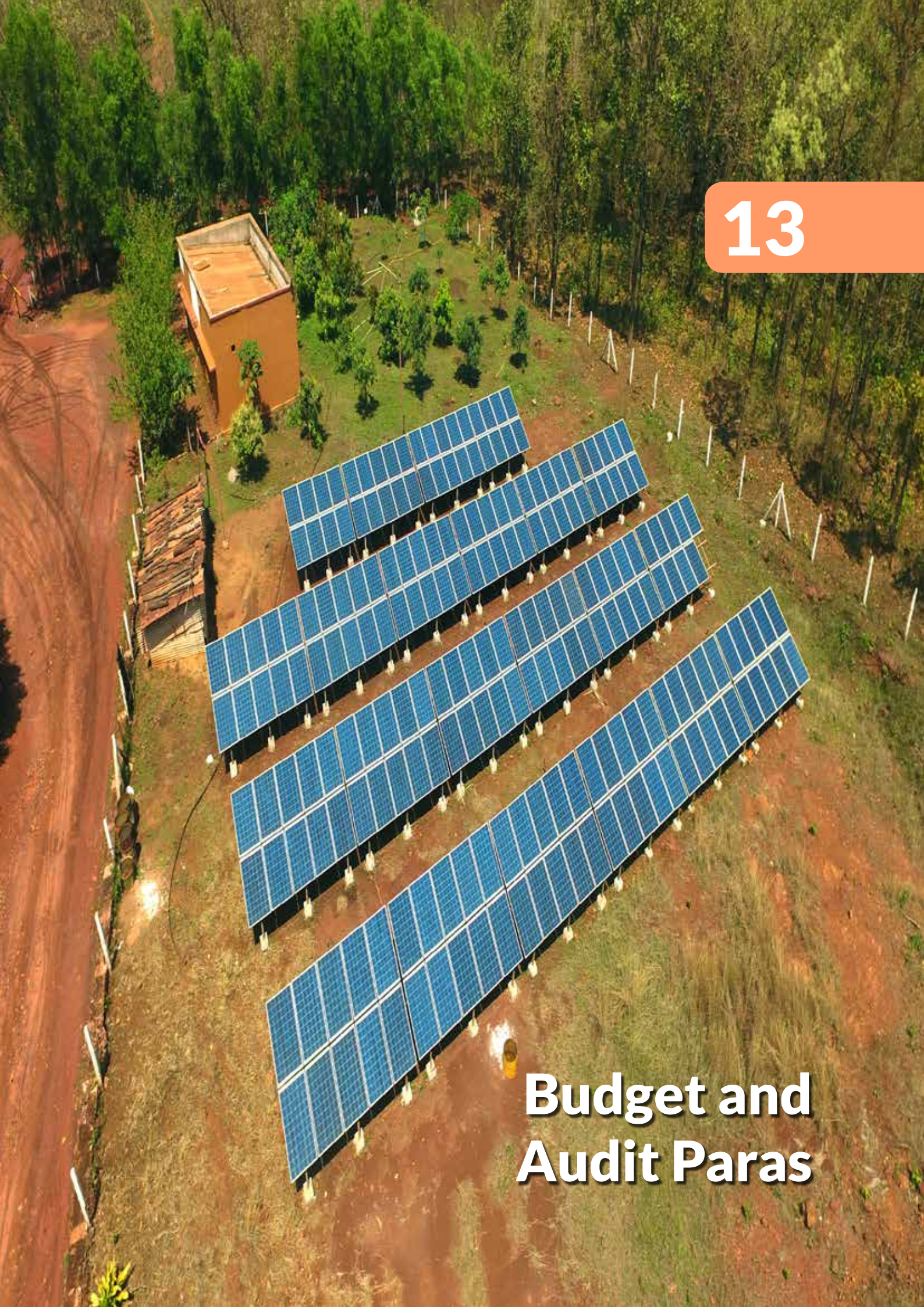
Physically Handicapped

12.34 The Institute is following all the standard guidelines & policies issued by Govt. / Ministry towards the Physically Handicap employee's reservation in recruitment.



Deployment of advanced mist cannon in mines

**Budget and
Audit Paras**



Budget and Audit Paras

- Budget Allocation for the year 2018 - 19 and 2019-20 Page - 163
- GSI Annual Plan 2018-19 Page - 163
- GSI Annual Plan 2019-20 Page - 163
- IBM Annual Plan 2018-19 Page - 165
- Audit Page - 166

Budget Allocation for the year 2018-19 and 2019-20.

Ministry of Mines

13.1 The Budget Estimates (BE), Revised Estimates (RE) 2018-19 and Budget

Estimates (BE) 2019-20 in respect of Demand No.65-Ministry of Mines including the Organisation wise breakup of the allocation is given in **Table 13.1**.

Table 13.1
The Organisation wise breakup of the allocation

(₹ In crore)

Sl. No.	Organisation	2018-19		2019-20
		BE	RE	BE
1.	Sectt. (Proper)(Including PAO)	43.58	29.96	33.50
2.	GSI	1057.87	1028.55	1163.47
3.	IBM	129.08	107.09	121.21
4.	MECL	6.00	6.00	0.00
5.	BGML	4.50	4.50	4.50
6.	NMA	0.65	0.65	0.65
7.	INT Cooperation	0.35	0.35	0.35
8.	NIRM	7.99	7.30	7.99
9.	NIMH	1.96	1.28	0.98
10.	JNARDDC	9.29	8.34	9.29
11.	Other Research Programmes	8.25	6.00	6.00
12.	NMET	400.00	50.00	150.00
	Total	1669.52	1350.02	1497.94

Geological Survey of India (GSI)

Annual Plan 2018-19

13.2 During the FY 2018-19, GSI received a total budget estimate (BE) grant of ₹1057.87 crore. This grant was reduced to ₹ 1028.55 crore in the revised estimate (RE) stage. Out of this GSI utilised an amount of ₹1023.63 crore (including Minor Works authorisations issued amounting ₹8.01 crore) which amounts to 99.52% of the total RE allocation.

Annual Plan 2019-20

13.3 GSI had proposed an outlay of ₹1393.52 crore in the Budget Estimate for FY 2019-20. Against this proposed outlay,

GSI has received a total budget grant of ₹ 1163.47 crore. This includes ₹ 621.97 crore for Establishment Expenditure and ₹ 541.50 crore for Schemes / Mission activities of GSI. Out of the total budget grant of ₹ 1163.47 crore, ₹ 1062.07 crore is under revenue heads and ₹ 101.40 crore is under capital heads. Major portion of the outlay under scheme activities include Survey & Mapping (₹ 109.85 crore), Modernisation & Replacement (₹ 101.40 crore), Information Dissemination (₹ 78.46 crore), Mineral Exploration (₹ 45.65 crore) and Tribal Area Sub-Plan (₹ 24.00 crore) schemes. Besides, an amount of ₹ 45.00 crore has been provisioned as Special Component Plan for Scheduled Caste.

13.4 The distribution of outlay for Annual Plan 2018-19 and 2019-20 including allocation for North Eastern Region (NER) and Tribal Sub Plan (TSP) is given in the **Table 13.2**.

Table – 13.2
Annual Plan 2018-19 & 2019-20

(₹ in crore)

S. No	Schemes / Programme	ANNUAL PLAN 2018-19						ANNUAL PLAN 2019-20					
		FINAL ESTIMATE						BUDGET ESTIMATE					
		Outlay				Outlay earmarked		Outlay				Outlay earmarked	
		Outlay	IR	EBR	GBS	North-East	TSP	Outlay	IR	EBR	GBS	North-East	TSP
1	Geological Survey of India	1028.55	0.00	0.00	1028.55	57.00	10.63	1163.47	0.00	0.00	1163.47	69.35	24.00
2	Construction												
	Geological Survey of India	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

13.5 Under 'Survey & Mapping' (Mission-I) allocation of ₹ 109.85 crore has been proposed for ground, aerial and marine survey programmes of GSI during FS 2019-20. Out of this, a major amount will be utilised for operation & maintenance of the three marine vessels and TOASS Aircraft of GSI. The rest amount will be utilised for execution of the ground based field items of Mission-I including payments for the NGPM surveys to be carried out by outsource agencies.

13.6 Under 'Mineral Exploration' (Mission-II), provision has been made for ₹ 45.65 crore for execution of the mineral exploration programmes of GSI including payment towards the outsourced drilling. Every year GSI is taking up more number of G4, G3 and G2 stage exploration programmes with a view to identify more number of auctionable blocks as well as to augment the mineral resources of the

country. There has been a quantum jump in the number of exploration programmes during the FS 2019-20 resulting in enhanced drilling, detailed mapping and large scale mapping targets in comparison to those of FS 2018-19.

13.7 Under 'Information & Dissemination' (Mission-III), ₹78.46 crore has been provisioned for payments related to the operation / maintenance of OCBIS, procurement of IT hardware & software, subscription of e-journals, other IT related expenditures; setting up of National Geoscience Data Repository (NGDR) and printing of publications / journals of GSI including the large amount of printing of publications / brochures / pamphlets related to IGC 2020 as well as procurement of hard copy journals.

13.8 Under 'Research & Development' (Mission-IV), ₹12.15 crore has been provisioned for procurement of spare parts,

consumables, chemicals, gases etc. required for smooth running of the laboratories of GSI including chemical analysis of samples through outsourced agencies, annual maintenance of sophisticated laboratory instruments as well as for expenditures for the R&D programmes of GSI. Similarly, ₹2.52 crore has been kept under the Special Investigation & Antarctica heads (Mission-IV) for field items related to geotechnical investigations, landslide, seismic / earthquake studies, environmental geology, glaciology and polar study, etc.

13.9 Under 'Human Resources Development' (Mission-V), ₹ 16.39 crore has been provisioned which includes ₹3.17 crore for the expenditures related to the different training courses slated to be conducted by the GSITI during FS 2019-20 and ₹ 13.22 crore has been provisioned as Grant-in-aid-General for the 36th IGC related activities to be organised in the year 2020.

13.10 Under 'Modernization & Replacement' scheme / activity, ₹101.40 crore has been provisioned which includes an amount of ₹ 90.90 crore under Machinery & Equipment (M&E) head, ₹10.00 crore under Motor Vehicle (MV) head and ₹ 0.50 crore under Other Capital Expenditure head (NER). Under the M&E head, major provision has been made for hydrostatic drilling rigs and procurements of high end laboratory and field instruments as per VAQ recommendations as well as other laboratory / field equipment. The projection under MV head has been made for procurement of field vehicles / trucks and water tankers, etc.

13.11 An amount of ₹ 24.00 crore has been provisioned under 'Tribal Area Sub Plan' (TSP) head for providing welfare service to

people living in the tribal areas indirectly through the mandated field activities of GSI under Mission-I, II & IV in notified tribal areas / areas under ST Lok Sabha Constituencies and skill development of tribal people through training programmes of Mission-V. Further, during FY 2019-20 GSI has provisioned an amount of ₹ 45.00 crore as Special Component Plan for Scheduled Caste which will be utilised for carrying out its mandated field activities under Mission-I, II & IV in the backward districts / areas under SC Lok Sabha Constituencies and skill development of scheduled caste people through training programmes of Mission-V, thereby providing indirect benefit to the such people living in these areas.

13.12 Under Minor Works head ₹ 35.50 crore has been proposed for setting up of the geo-science museum at Gwalior as well as for maintenance and renovation of the GSI buildings.

13.13 Under the Administrative Support Activities, an amount of ₹ 67.43 crore has been projected for expenditures like domestic / foreign travel, rents / taxes of buildings, office expenses and professional services. Another ₹ 3.15 crore has been provisioned for expenditures like supply & material, clothing & tentage and advertisement & publicity.

Indian Bureau of Mines (IBM)

Annual Plan 2018-19

13.14 IBM had proposed Plan outlay of ₹ 154.5440 crore for 2018-2019. The IBM's proposed outlay was mainly for five ongoing schemes and establishments. Proposed GBS and Allocation for annual plan 2018-19 is given in **Table 13.3**.

Table 13.3
Annual Plan 2018-2019
(proposed GBS and Allocation)

(₹ in crore)

Organization	Proposed Outlay	Allocated
IBM	154.5440*	129.08 #
IBM – Construction	31.1700	0.00

* It includes ₹ 7.49 crore for North Eastern Region and ₹ 3.00 crore for Tribal Area Sub Plan.

It includes ₹ 4.08 crore for North Eastern Region and ₹ 1.63 crore for Tribal Area Sub Plan.

13.15 Ministry has allocated outlay of ₹40.81 crore for 2018-2019 for five ongoing schemes and outlay allocated under establishment is ₹ 88.27 crore. Proposed GBS and Allocation for annual plan 2019-20 is given in **Table 13.4**.

Audit

13.16 The Audit Paras are being reviewed in the Standing Audit Committee (SAC) meeting under the Chairmanship of JS&FA (Mines). There were 9 Audit Paras pending in the Ministry as on 31.03.2019. 2 Paras have been settled during the year.

Table 13.4
Annual Plan 2019-2020 (proposed GBS and Allocation)

(₹ in crore)

Organization		Proposed Outlay	Allocated
IBM	Establishment	93.4900	85.07
	IBM Activities	*61.3600	**36.14
	Total	154.8500	121.21
IBM – Construction		60.3000	0.00

* It includes ₹ 6.14 crore for North Eastern Region and ₹ 2.45 crore for Tribal Area Sub Plan.

** It includes ₹ 3.61 crore for North Eastern Region, ₹ 1.55 crore for Tribal Area sub Plan & ₹ 2.99 crore for Scheduled Caste Sub Plan

13.17 The outlay for Annual Plan 2018-19 and proposed outlay for 2019-20 showing Internal Resources (IR), Extra Budgetary Resources (EBR), Gross Budget Support (NBS), North Eastern Region (NER), and Tribal Area Sub Plan (TSP) is given at the **Table 13.5**

Table 13.5
Annual Plan 2018-19 and 2019-20

(₹ in crore)

S. No	Schemes / Programme	Annual Plan 2018-19						Annual Plan 2019-20 (Proposed)								
		Plan Outlay			Outlay earmarked			Plan Outlay			Outlay earmarked					
		Outlay	IR	EBR	GBS	NBS	North-East	TSP	Outlay	IR	EBR	GBS	NBS	North-East	TSP	SCSP
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	IBM (Central Sector Schemes)	40.81	0.00	0.00	40.81	* 40.81	4.08	1.63	36.14	0.00	0.00	36.14	**36.14	3.61	1.55	2.99
2	Establishment	88.27	0.00	0.00	88.27	88.27	0.00	0.00	85.07	0.00	0.00	85.07	85.07	0.00	0.00	0.00
	Total	129.08	0.00	0.00	129.08	129.08	4.08	1.63	121.21	0.00	0.00	121.21	121.21	3.61	1.55	2.99

* The net Budgetary Support includes the outlay earmarked towards NER (₹ 4.08 crore) and TSP (₹ 1.63 crore).

** The net Budgetary Support includes the outlay earmarked towards NER (₹ 3.61 crore) and TASP (₹ 1.55 crore) and SCSP (₹ 2.99 crore).

IR - Internal Resources

EBR - Extra Budgetary Resources

GBS - Gross Budgetary Resources

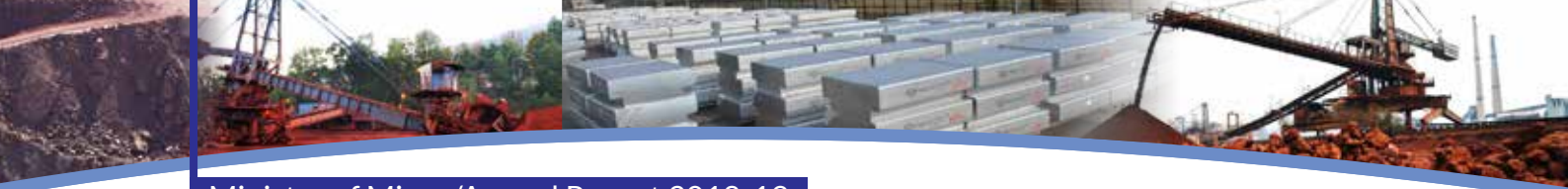
NBS - Net Budgetary Resources

Indian Bureau of Mines (IBM)

13.18 Audit objections as on 31.03.2019 are as follows:

Sl. No.	Item	AG's Audit	Internal Audit
1	Outstanding para's as on 31.03.2019	100	172
2	Audit Para raised during the year	--	184
3	Para settled	--	82
4	Outstanding para's as on 31.03.2019	100	274

As on March, 2019 No CAG Audit Para is pending in respect of IBM.



Dry Fog system in Ore crusher feeding point





Miscellaneous

Miscellaneous

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National Informatics Centre (NIC) IT Support by NIC at Ministry of Mines

14.1 National Informatics Centre (NIC) of the Ministry of Electronics and Information Technology is providing network backbone and e-Governance support to the Ministry of Mines. The following are the IT Services that NIC is providing to Ministry of Mines.

Management Information Systems for the Ministry

14.2 Ministry of Mines with the help of National Informatics Centre (NIC) is implementing various decision support system required for better planning, monitoring and decision making as given below: .

- a) Mineral Concession Approval System (MCAS)
- b) Revision Application System (RAS)
- c) Registration under Rule 45 of MCDR Rule 1988
- d) Post approval activities of Mineral Concessions at Indian Bureau of Mines
- e) Website of the Ministry
- f) TAMRA Portal
- g) NMET Website

Support for e-Governance Applications

14.3 The following e-Governance applications have been implemented and supported by NIC in the Ministry:

- PFMS for pay related data processing
- E-Office
- E-Visitor System
- Biometric Attendance System
- ACC Vacancy Monitoring

Local Area Network (LAN):

14.4 LAN has been established in the Ministry, which interconnects various officers/staff in the Ministry. There are approximately two hundred users connected to the LAN. All kind of trouble shooting is done by NIC to facilitate the smooth functioning of internet on user machines with the help of Facility Management services (FMS) team of the Shastri Bhawan Network Centre. Ministry of Mines has been made wifi enabled by NIC-Mines team.

Videoconferencing Support:

14.5 Videoconferencing of the Ministry officials with the State Governments, Subordinate offices, PSUs and PRAGATI VC being facilitated by the NIC-Mines team.

E-Office

14.6 The e-office is being implemented in the Ministry of Mines from May, 2013. The following modules have been successfully adopted.

- E File – (File Management System) – eFile system has been started with migrated data of File Tracking System(FTS). All new files are opened as e-files. All legacies files are being digitized for bringing them into e-file system. eSign option has also been introduced in eFile system (i.e. Aadhaar Based authentication) for easy and smooth functioning.
- LMS- (Leave Management System) – LMS has been started in August, 2012 and no physical leave applications are accepted for any Employee.
- KMS-(Knowledge Management System)- KMS is a central repository

for all employees to share all the documents/ O.M./ Office Order which they want to share with all as well as for personal use if they want to restrict.

- eTour- (Tour Management System)- eTour has started in September, 2013 and all officer(s) apply for tour and obtain approvals in this module.

Other than these applications the additional activities which have been carried out in e-Office are as follows:

- SMS/Email alert regarding file closing, file movement and leaves to all personnel.
- E-file MIS reports for all the employees to monitor the pendency of VIP/ PMO/ CabSec/ CAG & Audit Paras/DCN/Court Cases/DO Letters from Secretaries/ Joint Secretaries (Central)/ DO Letters from Chief Secretaries (States)/ Lok Sabha references and other categories of receipts and take necessary action accordingly.
- INTRA MINES link at dashboard of e-Office has been created in September, 2018 for issuing stationary items which makes it a transparent and easy process. Booking conference halls and video conference for meetings and trainings and to lodge complaints regarding LAN/ internet and for general complaints like furniture, computer etc. are the features available in this link.

Website of the Ministry

- Website of Ministry of Mines is developed and maintained by NIC. It provides comprehensive information on various subjects like Acts & Rules

and working of the Ministry, Right to Information Act, National Mineral Policy, information about the Indian Mineral Sectors, current status of the Revision Applications and Mineral Concession Cases, Annual Report of the Ministry and provides links to its PSUs and offices. The website is bilingual.

- The website of the Ministry is according to Guidelines for Indian Government Websites (GIGW) compliant and is Standardisation Testing and Quality Certification (STQC) certified.

E- Samiksha

14.7 e-Samiksha is a real time, on-line system for monitoring of follow-up action on the decisions taken during the presentations made by different Ministries/Departments to the Prime Minister, Centre State Coordination, Committee of Secretaries etc. The follow-up action in respect of all issues concerning other Ministries/Departments and State Governments is to be updated by the concerned Ministry/Department/ Agency on the e-samiksha portal and replies to issues raised by the Ministries /Departments and State Governments are taken up on priority and reply/status uploaded on e-samiksha every month.

Skill Development

14.8 The Ministry of Mines has joined hands with Ministry of Skill Development & Entrepreneurship (MSDE) to achieve faster, sustainable and inclusive growth through Skill Development in the Mining Sector. MoM along with its PSUs (NALCO, HCL and MECL) has signed Memorandum of Understanding (MoU) with Ministry of

Skill Development and Entrepreneurship (MSDE) and National Skill Development Corporation (NSDC).

14.9 Federation of Indian Mineral Industries (FIMI) with the approval of NSDC has set up Skill Council for Mining Sector (SCMS) in 2013. The SCMS is apex body for skill development in the mining sector. SCMS is a company registered under Section 25 of the Companies Act. SCMS had entrusted Deloitte Touche Tohmatsu India pvt. Ltd for conducting “Human Resource and Skill Requirement study for the period 2014-17 and 2017-22 for Indian Mining Sector”. Based on the study report a Skill plan for the Mining Sector (2016-2022) has been prepared with the help of SCMS which was unveiled at National Conclave on Mines & Minerals at Chhattisgarh in July, 2016. It aims to develop, design and disseminate training modules required for scientific, sustainable and safe mining practices within the framework of National policy of Skill Development and Entrepreneurship 2015. The main objective is to focus on outcome-based approach towards quality vocational training skills for both youth and employers to increase employability and better livelihood for individuals.

14.10 The activities to be undertaken under the skill plan are enumerated below:

- i. Enhancing the existing training facilities of PSUs, attached and subordinate offices of Ministry of Mines
 - ii. Setting up of 2 Centre of Excellence: one each by NALCO and HCL
 - iii. Skill development to get priority in fund allocation under CSR
- iv. Promoting Apprenticeship: 10% of the workforce shall be through apprenticeship programmes
 - v. Recognition of Prior Learning (RPL)
 - vi. Coordination of skilling efforts: engaging with States for skill development initiatives

14.11 National Aluminum Company Limited (NALCO)

Skill Development Programme

- In accordance with MOU signed with NSDC, RPL (Recognition of Prior Learning) certification training imparted to 420 workmen engaged in NALCO Bauxite mines under various contractors. Further, skill training also imparted to 1200 candidates in Company’s operational areas on retail, health care, beauty & wellness, banking, hospitality etc. out of which 744 candidates placed till March, 2019.
- In addition, skill training provided to 844 unemployed youths through 2 skilling partners out of which 255 already been placed till March, 2019
- Corporate Centre of Excellence for Mining Sector, with simulation facility, complying with the requisite guidelines of SCMS/NSDC is being set up at NRTC, Gothapatana, Bhubaneswar at an estimated cost Rs 20 crore which will be funded out of NALCO’s CSR fund. The simulator based training will be imparted in the center and on the job training would be provided in the company’s open cast mines at Damanjodi.



Skill development project by NALCO Foundation

- A Skill Development & Incubation Centre jointly being developed by NALCO and Utkal University to take up collaborative projects under industry institute interaction programme. It is the first-of-its-kind center for the non-technical students to help them become job-ready.
- In addition to above, NALCO also selected two skilling partners M/s Technopak and M/s Frontline, in Sep' 17 to impart training program to 2000 unemployed youths at Angul, Damanjodi, Bhubaneswar and Vizag area. The program will include 150 nos from PWD category and 700 women candidates.
- Also, NALCO Foundation in collaboration with MPCON



Skill development training NALCO.

Ltd., Gwalior, conducted skill development training programme for 100 candidates (4 batches) in mobile repairing and laptop repairing at Madhya Pradesh as on 31.03.2019. The second phase of the training programme will be conducted for 12 batches and 300 more youths will be imparted training.

14.12 Hindustan Copper Limited (HCL)

Training and Development of all levels of employees is given due priority by HCL to increase efficiency and effectiveness. Special emphasis was given to organization building and shaping right attitudes, team building and work culture besides preparing employees to understand the trends in fast changing technology/switching over to latest technology for achieving higher results in production, productivity and profitability.



RPL Skill Development Programme MCP HCL

14.13 A Skill Development institute has been set up at Khetri Copper Complex, Jhunjhunu (Rajasthan) by upgrading the existing training centre. Two batches with 55 numbers of students completed their 6 months theoretical training and practical training in the trade of 'Assistant Mines Surveyor'. A fresh batch of 30 trainees in the trade of 'Winding Engine Driver' has

started in March, 2019. These selected trainees shall undergo training for 14 months. The training programme is being conducted in collaboration with Skill Council for Mining Sector (SCMS).



Skill Development Institute, KCC- HCL

Redressal of Public Grievances

Ministry of Mines

14.14 Department of Administrative Reforms & Public Grievances (DAR&PG) is implementing a web based Centralized Public Grievance Redressal and Monitoring System (CPGRAM) vide which grievances of Ministries/Departments are forwarded for redressal. A Joint Secretary has been designated as the Nodal Officer of Public Grievances. During the year 2018-2019 (1st April, 2018 upto 31st March,2019) 1190 cases were received. 220 cases were brought forward. Total 1185 cases have been disposed during the period and rest cases have been referred to concerned Organization/Authority for taking further necessary action in the matter.

Geological Survey of India (GSI)

14.15 Geological Survey of India has adopted the most effective Public Grievance disposal system (Central Public Grievance Redress and Monitoring System) of Department Administrative Reforms & Public Grievances, Government

of India and worked as per CPGRAMS norms with specified time frame. In GSI office, the Director General & Deputy Director General (P&A) are monitoring the cases through regular meeting with the Nodal Officers of CHQ & Regional offices, which facilitates the speedy disposal of grievances.

14.16 Geological Survey of India has separate Unit/Cell in administrative machinery of each of its Regional offices and Central Headquarters headed by Nodal Officer (Public Grievance) under the supervision of Dy. Director General (P&A), to deal with the public grievances related to its organization. The grievance are mostly related to service matters of its serving as well as retired employees.

14.17 During the year 2018-19 (upto 31.03.2019), 646 cases of both Portal and Non-Portal were received. A total 568 cases have been disposed during the period and rest cases have been referred to concerned Regions/Authority for taking further necessary action in the matter.

14.18 Till 31st March, 2019, a total of 78 cases were pending of which a majority of cases were related to NFU/ACP/MACP/ Organised Service benefit/Compassionate appointment etc. and efforts are being made for speedy disposal of the pending grievance cases.

Indian Bureau of Mines (IBM)

14.19 During the year 2018-19 (up to March, 2019), 36 new grievance petitions were received. So far 26 cases have been disposed of. Remaining 10 case is under processing at various stages. Online facility for Registration of Public Grievances has already been provided by linking IBM

website with the Grievance Portal of DoPT "Central PGRAMS".

Hindustan Copper Limited (HCL)

14.20 All complaints received are registered in the Govt. web-site and accordingly disposed of. These are being regularly monitored. 101 public grievances were received during the period 2018-19 and there was previous carry forward of 19 grievances as on 1st April 2018. 107 cases were disposed off during the year and there were 13 Public Grievances as on 31.03.2019.

14.21 A link to public grievances site of Govt. of India www.pgportal.gov.in is provided in company's website www.hindustancopper.com at the main page as 'Public Grievance' in other information section' at the bottom. Public grievances can be lodged through this link.

Mineral Exploration Corporation Limited (MECL)

14.22 In MECL, Public Grievances are being dealt based on the guidelines received from the Ministry of Mines from time to time. These grievances are looked upon by Shri Ghanshyam Sharma, Director (Finance) who has been nominated as Director (Public Grievance). For further information on Public Grievances related to MECL, the same is made available at website <http://pgportal.gov.in>.

14.23 During FY 2018-19, the number of cases reported were 13 out of which 12 were disposed of under Public Grievances. The monthly/ quarterly reports on Public Grievances are being regularly sent to the Ministry of Mines.

Vigilance cases

Ministry of Mines

14.24 During the year 2018-19 from 1.1.2018 to 31.3.2019, 32 complaints were received. Out of these 32 complaints 23 were brought to their logical conclusion and 9 complaints are pending. Vigilance Awareness Week was observed from 29.10.2018 to 03.11.2018. During the week, essay competition and debate competition related to vigilance activities was organized.

Geological Survey of India (GSI)

A glimpse of Vigilance activities carried out at GSI during FS 2018-19

14.25 To uphold the canons of transparency, fairness and righteousness, Vigilance Division of GSI adopted a three pronged approach viz. i) Preventive Vigilance, ii) Surveillance, iii) Punitive Vigilance with major emphasis on Preventive Vigilance exercise. The common mistake and irregularities as discerned from procurement files were collated and shared with stakeholders in presence of DG, GSI through video conference wherein the deviation from rules were explained without referring to any specific case. A schedule of Regular inspection covering sensitive areas was prepared and outcome, in appropriate cases, was communicated to the concerned officers.

14.26 Further, Vigilance Division had identified sensitive posts, conducted random scrutiny of AIPRs, organised training/workshop, prepared ODI and Agreed List etc. as per mandate of Vigilance Manual – 2017. Vigilance Awareness Week – 2018 was observed as directed by CVC.

4 (four) numbers of complaints were pending as on 1st April, 2018 and 15 (fifteen) more complaints were received during F.Y. 2018-19. Out of these 19 complaints, 14 complaints were disposed of by March, 2019. 5 (five) complaints were carried forward to F.Y. 2019-20.

14 (fourteen) Chief Technical Examiner (CTE) type examinations were carried out during the FY 2018-19 based on which certain suggestions were given to the HoDs of the concerned Regions for ensuring transparency.

Indian Bureau of Mines (IBM)

14.27 During the year 2018-19 (up to March, 2019), 03 complaints were received of which all the 03 were brought to their logical conclusion and appropriate action initiated as deemed fit after investigation. During this period Ministry has issued charge sheet against 05 officers of IBM.

14.28 This year Vigilance Awareness Week was observed during the period from 29.10.2018 to 03.11.2018 in IBM HQ at Nagpur and in all zonal/regional offices of Indian Bureau of Mines as per directive of CVC.

Swachh Bharat Abhiyan

Ministry of Mines

14.29 Ministry of Mines and organizations under the Ministry organized the following 6 fortnights under the Swachh Bharat Abhiyan;

- i) 15.09.2015 to 31.09.2015
- ii) 12.12.2015 to 27.12.2015
- iii) 01.03.2016 to 15.03.2016
- iv) 16.06.2016 to 31.06.2016
- (v) 16.12.2017 to 31.12.2017
- (vi) 16.10.2018 to 31.10.2018

Adoption of ICONIC Heritage sites

14.30 NALCO has adopted Shri Jagannath Temple Puri and HZL has adopted Ajmer Sharif Dargah and have started preparation of Action Plan for comprehensive improvement of these two ICONIC Heritage places.



Annual Festival of Shri Jagannath Temple at NALCO Township at Damanjodi

Activities under Swachh Bharat Mission

14.31 Ministry of Mines has ensured in its day to day activity that toilets, rooms and corridors are kept clean. Waste item bins have been strategically placed to ensure that things are not thrown around. It has also been ensured that people don't spit or smoke in the premises or use gutka and other chewable items. Posters have been placed at various places to bring home this message. Administration carries out inspections to ensure cleanliness.

Removal/Disposal of waste/condemned items and vehicles

14.32 The Ministry has auctioned all those items which were old/ unserviceable through the tender process. The Ministry does not have any condemned vehicle in its premises.

Seepage of condensed water of ACs

14.33 Ministry of Mines has ensured that water seeping through ACs are properly drained out without any accumulation.

Proper cabling of cable TV/dish antenna wires

14.34 All the electrical cables/TV cables have been placed inside the conduit pipes and it is ensured that there are no loose wires hanging around. The false ceilings in the corridors have been strengthened.

Fire safety measures

14.35 Instructions have been issued for fire safety and instruction has been issued to ensure that all electrical points are switched off after closing of the office.

Right to Information Act, (RTI)

Ministry of Mines

14.36 The Ministry of Mines and its subordinate office, attached office, Autonomous Bodies and Public Sector Undertakings (PSUs) have appointed

Central Public Information Officers and Appellate Authorities. The List of Nodal Officer, CPIOs and Appellate Authorities in Ministry of Mines is given at **Annexure 14.1 (Page No. 199)**. The Ministry has also set up a 'Public Information Cell' for processing of the requests received from the public under the RTI Act, 2005 and for their monitoring. During the period 2018-19 (from 01.04.2018 to 31.03.2019), the Ministry received 496 applications under the RTI Act, which were timely responded. 29 Appeals received against the decisions of the CPIOs were disposed of by the concerned Appellate Authorities within the stipulated time frame. The status regarding receipt and disposal of RTI Applications/ Appeals in Ministry and its office is given at **Table 14.1, Table 14.2** and **Table 14.3** respectively.

Table 14.1
RTI Application/Request Status (w.e.f. 1st April, 2018 to 31st March, 2019)
(Only consolidated figures to be given)

Organization	No. of cases					*Pendency			
	Previous pendency	No. of RTI Request/ Application received during the period	Disposal	Balance	Information denied under section 8 (1), 9,11,24 & Others of RTI Act.	0-3 months	4-6 months	7-9 months	10-12 months
Ministry of Mines (Sectt.)	10	496	463	43	16	35	04	01	03
NALCO	18	337	232	16	107	16	NIL	NIL	NIL
GSI	49	718	712	34	21	16	18	NIL	NIL
HCL	19	276	267	28	31	28	0	0	0
MECL	06	84	73	11	06	05	01+03*	02*	NIL
IBM	14	448	450	12	30	12	NIL	NIL	NIL
NIMH	NIL	15	15	NIL	NIL	NIL	NIL	NIL	NIL
NIRM	0	27	24	3	0	3	0	0	0
JNARDDC	NIL	21	21	NIL	02	NIL	NIL	NIL	NIL

* Pending due to non-receipt of Document Charges from the RTI Applicant.

Table 14.2
RTI Appeal Status (1st April, 2018 to 31st March, 2019)
(Only consolidated figures to be given)

Organization	No. of cases					Pendency			
	Previous pendency	No. of 1st Appeal received during the period	Disposal	No. of Appeals rejected/ inf. denied under Section	Balance	0-3 months	4-6 months	7-9 months	10-12 months
Ministry of Mines (Sectt.)	01	29	28	0	02	0	02	0	0
NALCO	NIL	61	56	04	01	01	NIL	NIL	NIL
GSI	06	109	110	NIL	05	05	NIL	NIL	NIL
HCL	07	51	46	06	06	06	0	0	0
MECL	NIL	04	04	NIL	0	NIL	NIL	NIL	NIL
IBM	05	52	57	0	0	NIL	NIL	NIL	NIL
NIMH	NIL	01	01	NIL	NIL	NIL	NIL	NIL	NIL
NIRM	0	0	0	0	0	0	0	0	0
JNARDDC	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL	NIL

Table 14.3
CIC 2nd Appeal Status (1st April, 2018 to 31st March, 2019)
(Only consolidated figures to be given)

Organization	No. of cases				
	Previous pendency	No. of 2nd Appeals filed in CIC	Decided		Balance
			In favour of Appellant	In favour of Organisation	
Ministry of Mines (Sectt.)	0	07	02	05	0
NALCO	01	09	06	04	NIL
GSI	01	08	NIL	07	02
HCL	01	05	0	05	01
MECL	NIL	01	NIL	01	NIL
IBM	18	01	0	0	19
NIMH	NIL	NIL	NIL	NIL	NIL
NIRM	0	0	0	0	0
JNARDDC	0	0	0	0	0

Solar Power

14.37 On the directions of Ministry of New and Renewable Energy under its National Solar Mission, Ministry of Mines has directed all its field organizations to install Roof Top solar power systems as part of its efforts towards adopting renewable energy and energy savings.

- Shri Anil Kumar Nayak, Joint Secretary, Ministry of Mines has been nominated as Nodal Officer for RTS Power Project.
- Commitment Certificate for Solar Roof Top and Land Based Systems in respect of Ministry of Mines was signed and given to MNRE on 26.05.2016. Ministry of Mines has committed to install 34 MW capacity of Solar Power generation by 2022.
- M/s. Rajasthan Electronics & Instrumentation Limited (REIL) was nominated as the facilitator by the MNRE for implementing the roof top projects in the field offices of the Ministry of Mines.
- REIL has been sanctioned for implementation of 10.894MWp capacity grid connected rooftop solar power plants from MNRE in the roof tops of the buildings of the field organizations of Ministry of Mines.

LED Lighting

Ministry of Mines

14.38 Hon'ble Prime Minister of India, on 5th January, 2015 launched the National LED Programme to facilitate rapid adoption of LED-based home lighting and street lighting across the country.

14.39 The work of installation of LED based lightings in all rooms of Ministry

of Mines in Shastri Bhawan have been completed.

- NALCO has also completed the work of fitting of LED based lights in its Mines, Refinery, Smelter, Captive Power Plant and Corporate office.
- HCL & MECL has also completed the work of fitting of LED based lights in all its premises.
- The work of installation of LED based lightings in the offices of GSI and IBM are under progress.
- JNARDDC, NIRM and NIMH has also completed the work of fitting of LED based lights in all its premises.

14.40 Government e-Market (GeM) Portal

Ministry of Mines has been procuring various items it needs through GeM portal. During Financial Year 2018-19 the Ministry procured items worth ₹ 1,86,55,618. Total number of 621 order were placed on the portal during financial year 2018-19 by Ministry of Mines.

14.41 Important Days observed in Ministry of Mines

During the year 2018-19, the following days were observed in Ministry of Mines:

- (i) Anti Terrorism day on 21.5.2018 to oppose all forms of terrorism and violence.
- (ii) Sadbhavana diwas on 20.8.2018 to commemorate the birth anniversary of late Prime Minister of India, Shri Rajiv Gandhi.
- (iii) Rashtriya Ekta Diwas on 31.10.2018

to commemorate the birth anniversary of Shri Sardar Vallabhai Patel. On this occasion a Run for unity was conducted and T-shirts were provided to all participants.

- (iv) Constitution day on 26.11.2018 to commemorate the birth anniversary of Dr. B.R. Ambedkar. "Preamble" to our Constitution was read out on the occasion.
- (v) Communal Harmony week was observed during 19.11.2018 to 25.11.2018 and Communal Harmony

Flag Day on 25th November 2018. On Flag Day, donations have been collected from all the staff of Ministry of Mines and the collected money was sent to National Foundation for Communal Harmony.

- (vi) National Voters Day on 25.1.2019 to mark the Foundation day of Election Commission of India.
- (vii) A pledge taking ceremony was also organized on all these occasions and all the officers and employees of Ministry of Mines participated in it.



OMCKaliapani-active-waste-dump



Exploration by MECL



An aerial photograph of an industrial complex. On the left, a tall, slender, light-colored chimney stands prominently. To its right, a large, multi-story building is under construction, with its steel framework and concrete pillars visible. The foreground is filled with dense green trees, and the background shows a hazy, mountainous landscape under a clear sky. A purple banner with the word 'Annexes' in white text is positioned in the upper right corner.

Annexes

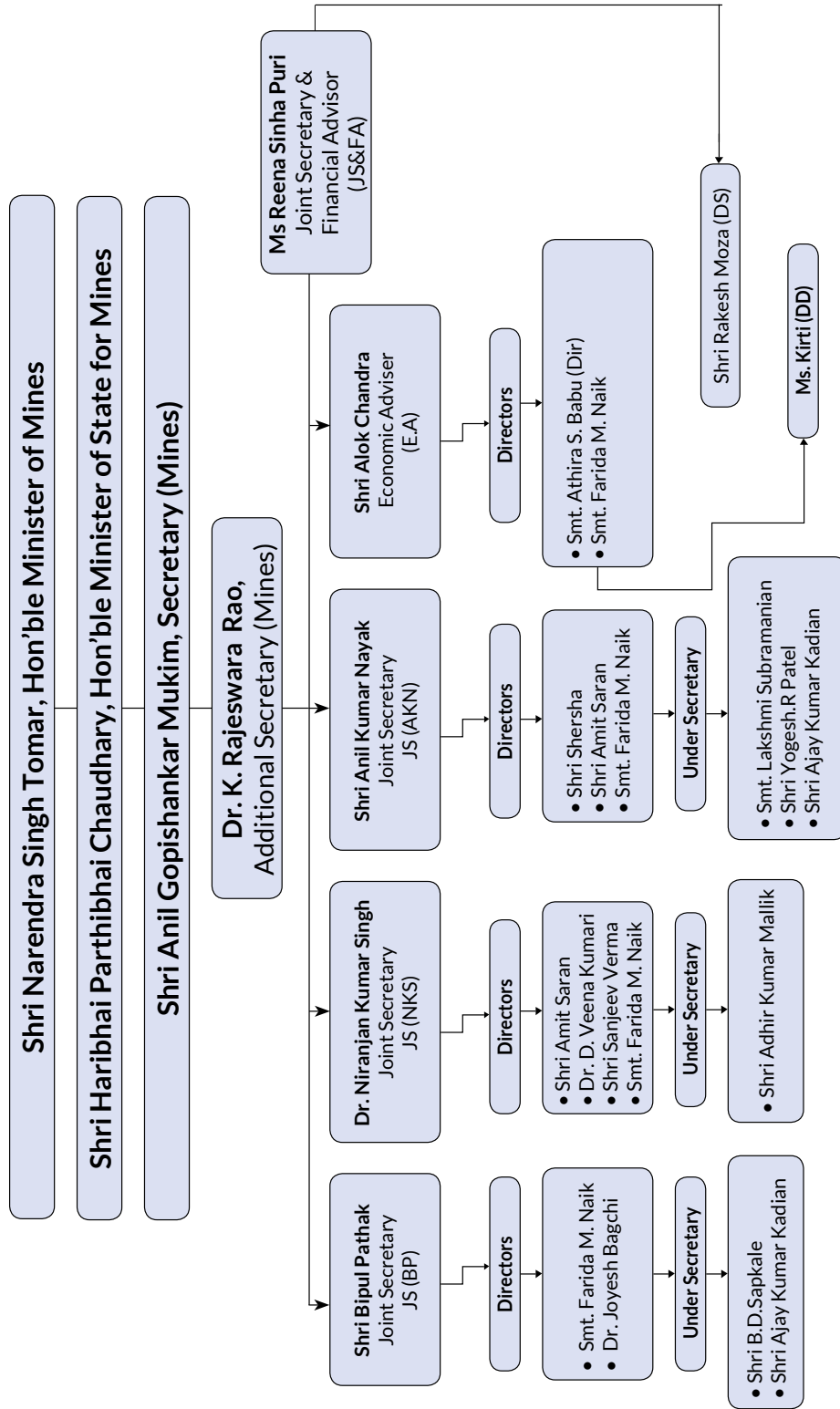
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Organizational Structure of Ministry of Mines

(as on 31st March, 2019)



Production of Selected Minerals, 2014-15 to 2018-19
(Excluding Atomic & Fuel Minerals)

(Value in ₹ crore)

All Minerals	Unit	2014-15		2015-16		2016-17		2017-18(P)		2018-19(E)	
		Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
Metallic			97214.91		95188.04		101783.10		112632.00		124019.47
Bauxite	th. tonnes	22493.67	1192.24	28123.79	1543.77	24745.49	1486.55	22312.68	1502.07	23193.68	1658.29
Chromite	th. tonnes	2164.16	1880.03	2915.58	2121.45	3727.78	3193.75	3480.93	3210.92	3445.11	3073.51
Copper Conc.	th. tonnes	107.6	528.94	151.84	654.83	134.79	650.61	141.86	774.28	158.04	954.75
Gold	kg	1441.00	360.27	1323.00	321.46	1595.00	436.24	1648.00	476.31	1360.00	419.30
Iron Ore	Mt. tonnes	129.32	27663.68	158.11	22320.66	194.58	25229.18	200.96	34262.89	199.21	44090.16
Lead Conc.	th. tonnes	197.67	5.64	261.86	788.51	268.05	966.93	306.40	1142.94	347.19	1562.07
Manganese Ore	th. tonnes	2369.48	1366.18	2166.95	854.55	2395.13	1624.84	2589.27	1971.75	2687.76	2174.32
Zinc Conc.	th. tonnes	1489.37	3157.22	1473.81	3494.31	1484.24	4338.56	1539.66	4979.93	1434.68	5481.51
Other Met. Minerals			1196.56		1522.16		1832.95		2118.92		1594.70
Non Metallic Minerals			7914.80		7572.03		8029.19		8197.70		9016.55
Diamond	crt	36107	61.35	36044	62.14	36491.00	63.96	39699.00	41.07	29615.00	53.97
Garnet (abrasive)	th. tonnes	91.39	80.1	82	64.81	85.41	78.73	158.15	163.67	159.46	206.75
Limeshell	th. tonnes	16.35	3.71	10.35	2.86	12.34	3.48	10.89	3.96	7.66	2.89
Limestone	Mt. tonnes	293.27	5800.04	307	6867.4	314.67	7387.84	338.55	7440.74	370.33	8280.41
Magnesite	th. tonnes	285.01	74.88	327.66	82.71	299.15	74.93	195.03	50.39	148.28	39.76
Phosphorite	th. tonnes	1607.22	375.91	1571.86	376.38	1124.44	299.67	1534.27	377.16	1176.57	310.06
Sillimanite	th. tonnes	66.27	45.61	69.94	50.93	68.13	53.59	81.64	66.93	77.02	64.97
Wollastonite	th. tonnes	186.52	16.21	175.35	15.03	166.19	15.88	153.05	12.67	148.89	13.66
Other Non-Met. Min.			#1457		49.77		51.10		41.11		44.09
Minor Minerals			51391.00		53994.30		53994.30		53994.30		53994.30

Mt. Tonnes - Million tonnes; th. tonnes - Thousand tonnes

(P) Provisional.

(E) Estimated figures

Note: # Includes 31. minor minerals declared as minor minerals vide notification dated 10.02.2015. The data for these minerals for 2014-15 onwards is included in minor minerals.

Source: a) Minerals covered under MCDR; MCDR returns

b) Minor Minerals: State Governments (data repeated in case of non-availability).

Exports of Ores & Minerals

(Value in ₹ '000)

Ores & Minerals	Unit	2013-14 (R)		2014-15 (R)		2015-16 (R)		2016-17 (P)		2017-18 (P)	
		Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
All Minerals		**	97214.91	**	95188.04	**	101783.10	**	112632.00	**	124019.47
Diamond		**	1581348136	**	1780194115	**	1709463248	**	2001306842	**	1991204401
Iron Ore	THt	16302	94811058	7297	31436685	5441	12639633	30728	102929254	24380	94901382
Granite	TON	6802309	98685777	6563271	98222392	5674568	92720986	6094341	93368588	6524816	92485125
Alumina	TON	1294651	25423462	1583590	32974199	1368526	25895759	1509464	30030430	1361382	32961495
Emerald (Cut & Uncut)		**	21570151	**	15945397	**	17879971	**	20340187	**	17757744
Precious & Semi-Precious Stones (Cut & Uncut): Total		**	16965363	**	12993434	**	12590259	**	11080271	**	12653546
Sandstone	TON	540874	7579280	627008	8523122	744657	10161784	710400	9071313	930902	12323873
Building And Monumental Stones Nes	TON	1686357	6268600	6127052	7786180	5133276	8489458	8211193	12089834	7715765	10165733
Salt (Other Than Common Salt)	TON	4956931	6562927	4776491	6390692	5926639	6701176	7897937	7450785	9969601	9402723
Barytes	TON	1067755	8699414	651571	4525677	743407	6517075	1067313	7669141	1652975	9308877
Coal (Ex Light)	THt	2188	10843196	1237	7202914	1576	9006274	1772	9669603	1502	8777023
Marble	TON	337937	5703443	325707	5990615	289853	5998393	326977	7048204	355364	7664933
Mica	TON	127882	3759755	141100	4263733	135805	4229719	135163	4555655	154553	6191768
Titanium Ores & Conc.	TON	687923	10412482	779598	7179647	790489	6644935	532204	5716719	355474	6010134
Bentonite	TON	1225568	3860453	1300083	3999732	1572469	4814343	1538134	4798150	1599608	4825168
Quartz And Quartzite	TON	308409	2233312	410497	2938739	388192	3025919	488800	3579270	550361	4286632
Sulphur (Exc. Sublimed Precipitated & Colloidal)	TON	577695	3949918	397399	3714082	628164	5157081	616472	3469350	573855	4254429
Limestone	TON	2779074	3432310	3812759	4671970	3236010	4694274	4330822	4990065	2812042	4102331
Copper Ores & Conc.	TON	38912	3349916	1	10	11432	712919	22711	1054322	61005	3805458
Steatite	TON	149343	2028614	158405	2156568	187287	2709689	251546	3456143	243850	3576256
Natural Gas	TON	4922	282767	138168	4901801	126951	3798603	37072	1521058	70838	2946152
Bauxite	TON	3492546	6736459	6808588	14050662	8914624	19527404	2790675	5105333	1529308	2705040
Felspar (Natural)	TON	437144	2234474	589820	2876165	426172	232791	481457	2495595	539102	2688250
Other Minerals Nes	TON	855864	1180655	1768058	1773764	1362345	1200053	757361	1663194	1670509	2507325
Garnet (Abrasive)	TON	480774	6060267	448559	5673831	480408	5950862	387276	4691843	157224	2346630
Remaining Minerals		**	13853011	**	8880404	**	8823697	**	16396285	**	12337364

Source: DGCI, Kolkata

P: Provisional, R: Revised

** : Quantity in different units

Note: Top 25 Minerals by Value during 2017-18

Imports of Ores & Minerals

(Value in ₹ '000)

Ores & Minerals	2013-14 (R)		2014-15 (R)		2015-16 (R)		2016-17 (P)		2017-18 (P)	
	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
All Minerals	**	12158267977	**	10717328023	**	7387889415	**	8094451080	**	10285012919
Petroleum (Crude)	189176	8696574353	187913	709379567	202314	4293999336	214886	4742189329	218104	5630977139
Diamond	**	1349155095	**	1252140915	**	1105651209	**	1296740696	**	1902035832
Coal(Ex Lignite)	166861	923353960	212106	1045300817	204000	861073456	191014	1003162924	208279	1384845576
Natural Gas	13020689	516992878	13289155	563400559	14376924	437824474	17783327	402490252	20176813	523664504
Copper Ores & Conc.	2048240	332267405	1702247	285028247	1886199	262965391	1143216	182986972	1488163	278344776
Coke	4167206	67948150	3290324	43751480	3019502	31956109	4368063	54356105	4589015	91542188
Emerald (Cut & Uncut)	**	22328771	**	63062390	**	87263269	**	113428795	**	77934749
Alumina	1169523	27542196	790305	21244790	998446	22924845	1403569	33417506	2224196	60483411
Manganese Ore	2179334	28306276	3172858	34669120	2216864	17413688	1908258	24028138	3567271	50633967
Precious & Semi-Precious Stones (Cut & Uncut): Total	**	12574991	**	14675045	**	21000369	**	24660623	**	46165230
Rock Phosphate	7160798	55177897	8273261	61888709	8037745	65290422	7511445	49513134	7702634	45457006
Iron Ore	369	3423552	12093	65947377	7099	31971444	4607	21615219	8706	42293972
Limestone	13214179	21580368	13943781	22138585	17187164	23772768	18300359	24384182	20827697	29016416
Marble	757948	22107199	778503	23839861	858061	27392157	882265	26142989	1164248	22696789
Asbestos	285870	13298989	396493	17168106	355686	14865511	310592	11279369	357182	11603678
Sulphur (Exc. Sublimed Precipitated & Colloidal)	1289979	11002923	1626407	17445432	1432632	14172610	1345520	8751428	1206433	10628790
Gypsum	3231930	5252009	4421048	6747745	4068412	5713627	4423811	6051112	5740955	8254199
Molybdenum Ores & Conc.	5572	5558079	8093	8646301	7511	4903721	7139	5442499	9169	8149457
Bauxite	421612	3662474	1800689	8560884	1116010	5982901	1894927	7785093	1461495	7727096
Zirconium Ores & Conc.	50945	3772861	47656	3331467	53208	3691649	73932	4569039	83781	6202746
Dolomite	2511602	3736523	2014760	3146095	1931136	2998295	2010665	2999705	5360336	5362525
Magnesite	66001	2216906	102077	3327762	118788	3256840	142599	3089947	229630	5268653
Barax	112775	3551231	146301	4474018	133551	4429455	129407	4359797	160134	4753976
Fluorspar	117254	2412180	155673	2967073	163113	2908707	190446	2992257	221818	3958977
Precious Metal Ores & Concentrates	179	106976	101602	2252601	78654	13658295	83322	19423078	15298	3363976
Remaining Minerals	**	24363735	**	28379077	**	20808867	**	18590892	**	23647291

Source: DGCS, Kolkata
P: Provisional, R: Revised
*: Quantity in different units
Note: Top 25 Minerals by Value during 2017-18

Annexure 2.4 (Contd.)

Mineral	Unit	Reserves					Remaining Resources							Total Resources (A+B)	
		Proved		Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance		Total (B)
		STD 111	STD 121	STD 122	STD 121	STD 221		STD 222	STD 331						
Diaspore	tonne	3242363	884525	3755546	7882434	114789	498756	480663	14241	110358	1045944	46068	2310817	10193251	
Diatomite	'000 tonnes	0	0	0	0	634	0	0	0	0	2251	0	2885	2885	
Dolomite	'000 tonnes	431750	107364	138770	677884	372515	323183	537932	307103	757005	5215075	224194	7737007	8414891	
Dunite	'000 tonnes	10848	18	1901	12768	436	1925	108887	25202	1087	23832	13680	175049	187818	
Emerald	Kgs	0	0	0	0	0	0	0	0	0	0	55869	55869	55869	
Feldspar	tonne	173383004	103054634	43403974	319841612	45903221	42467787	40160373	13882441	17928113	150012330	3371567	313725831	633567443	
Fireclay	'000 tonnes	13295	5035	8707	27037	13878	30155	18260	49290	54093	524011	6104	695791	722829	
Fluorite	tonne	224824	63860	0	288684	4976749	745390	571311	1713833	6218421	3522537	145183	17893423	18182107	
Fuller's Earth	tonne	3941000	0	0	3941000	0	0	58200	0	912340	256467419	0	257437959	261378959	
Garnet	tonne	9917936	278493	2587427	12783856	84320	1643412	3287667	121099	10247428	27992906	333	43377166	56161022	
Gold															
Ore (Primary)	tonne	10404349	6401725	422100	17228174	1925669	1303000	1968176	30333248	70136727	233608305	145336333	484611458	501839632	
Metal (Primary)	tonne	53.41	16.26	0.42	70.09	7.69	3.85	12.1	128.65	143.8	227.44	61.12	584.65	654.74	
Ore (Placer)	tonne	0	0	0	0	0	0	0	0	2552000	23569000	0	26121000	26121000	
Metal (Placer)	tonne	0	0	0	0	0	0	0	0	2.29	3.57	0	5.86	5.86	
Granite (Dimension Stone)	'000 cum	35741	201377	26574	263692	38462	51990	8234	837325	2063964	42543908	512216	46056098	46319790	
Graphite	tonne	4229675	1204423	2526694	7960793	9571933	3825575	3593404	741377	7368340	22361229	139464128	186925987	194886779	
Gypsum	'000 tonnes	35141	311	1169	36621	10826	93127	33419	9071	713834	428097	4518	1292892	1329513	
Iron Ore (Hematite)	'000 tonnes	4053032	449917	918801	5421751	3444103	1573822	1496674	1762741	1798557	4498142	2491176	17065214	22486965	
Iron Ore (Magnetite)	'000 tonnes	30352	2311	20037	52699	223388	15494	64091	1513195	1984566	6351286	584436	10736455	10789155	

Annexure 2.4 (Contd.)

Mineral	Unit	Reserves					Remaining Resources									
		Proved		Probable		Total	Feasibility		Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance	Total	Total Resources
		STD 111	STD 121	STD 122	STD 122	STD 211	STD 221	STD 222	STD 331	STD 332	STD 333	STD 334	(B)	(A+B)		
Kyanite	tonne	639121	0	48958	688079	1505114	2193427	579619	3577402	95869713	0	104293480	104981559			
Laterite	'000 tonnes	98598	12527	13608	124733	49655	22724	3532	2626	243535	250787	581819	706552			
Lead & Zinc Ore																
Ore	'000 tonnes	31662	68687	5767	106116	5564	31297	37055	192083	355403	4530	643343	749459			
Lead Metal	'000 tonnes	624.56	1666.02	191.76	2482.34	119.31	780.56	690.65	2171.43	6237.67	0	10521.36	13003.7			
Zinc Metal	'000 tonnes	2871.75	6728.14	399.63	9999.52	364.08	1362.05	1941.94	7931.06	13722.2	101.65	26363.24	36362.76			
Lead & Zinc Metal	'000 tonnes	0	0	0	0	0	0	0	0	120.76	22.37	143.13	143.13			
Limestone	'000 tonnes	9438939	3015917	3880897	16335753	4870440	8623172	7111337	22629060	130787772	8014504	186888998	203224752			
Magnesite	'000 tonnes	77867	165	4244	82276	6210	45574	59010	59652	131707	213	311711	393988			
Manganese Ore	'000 tonnes	62982	19715	10778	93475	70742	73823	18189	42803	135722	16513	402399	495874			
Marble	'000 tonnes	0	0	4551	4551	104236	72387	0	107129	1453386	2200	1941341	1945891			
Marl	tonne	117115856	4650000	2090000	123855856	11704870	0	0	0	0	0	11704870	135560726			
Mica	kg	82187635	20035595	12209547	114432777	38252500	124089303	1433353477	56528016	144446953	3593715	520869364	635302141			
Molybdenum Ore	tonne	0	0	0	0	0	0	36000	569304	17098594	167800	19371698	19371698			
Cotained MoS2	tonne	0	0	0	0	0	0	83	287	1119803	5034	12668.37	12668.37			
Nickel Ore	mill. tonnes	0	0	0	0	0	21	31	53	63	0	189	189			
Ochre	tonne	21959552	4448341	10525912	36933805	44924890	31896176	2559245	3560819	32369262	1612607	130859201	167793006			
Perlite	'000 tonnes	0	0	0	0	140	595	0	0	0	988	2406	2406			
Platinum Group of Metals (PGM)	In tonnes of Metal content	0	0	0	0	0	0	0	7.71	6.5	1.5	15.71	15.71			

Annexure 2.4 (Contd.)

Mineral	Unit	Reserves				Remaining Resources							Total Resources (A+B)			
		Proved		Probable		Total (A)	Feasibility	Pre-feasibility		Measured	Indicated	Inferred		Reconnaissance	Total (B)	
		STD 111	STD 121	STD 122	STD 121			STD 221	STD 222							STD 331
Potash	million tonnes	0	0	0	0	0	0	0	0	0	18142	3660	707	22508	22508	
Pyrite	'000 tonnes	0	0	0	0	27129	9539407	8301411	4240016	9590	77729	1527356	0	0	1674401	1674401
Pyrophyllite	tonne	16575493	4322386	4035079	24932958	9539407	8301411	4240016	1118943	3589624	7533340	360006	360006	34682745	59615703	
Quartz & Silica Sand	'000 tonnes	433014	93339	1211169	647522	354566	368216	362128	36872	219180	1897899	21436	21436	3260298	3907819	
Quartzite	'000 tonnes	47758	2016	33698	83472	120723	141437	160355	119953	152715	868850	11293	11293	1575325	1658798	
Rare Earth Elements	tonnes	0	0	0	0	0	0	0	0	6353	19140	0	0	25493	25493	
Rock Phosphate	tonne	43832936	5179	1969370	45807485	10679080	36271671	25008353	2912633	3549750	185771368	2678275	2678275	266871130	312678615	
Rock Salt	'000 tonnes	0	0	0	0	10035	0	5990	0	0	0	0	0	16025	16025	
Ruby	kg	0	0	0	0	0	429	3296	0	0	1623	0	0	5349	5349	
Sapphire	kg	0	0	0	0	0	0	0	0	0	450	0	0	450	450	
Shale	'000 tonnes	15027	171	274	15472	495	0	2022	0	0	1175	90	90	3781	19253	
Sillimanite	tonne	323231	5728868	450016	6502115	1020187	135278	20257525	4580083	17790664	16068690	3849600	3849600	63702027	70204142	
Silver Ore	tonne	69277075	8413000	72753828	150443903	0	1484543	46726460	29632000	64946000	218721729	0	0	361510732	511954635	
Metal	tonne	430978	22077	264139	717194	0	4285	25962	203799	3233639	1723303	0	0	2280988	2998182	
Slate	'000 tonnes	19619	667	0	20286	0	0	1075	0	0	1511	0	0	2586	22872	
Sulphur (Native)	'000 tonnes	0	0	0	0	0	0	0	0	0	210	0	0	210	210	
Talc / Steatite/ Soapstone	'000 tonnes	72172	8067	26251	106490	18178	13020	32221	2994	8126	128620	6275	6275	209434	315924	
Tin																
Ore	tonne	2067	897	1455	4419	22594200	2653	31330072	168457	561080	29064288	0	0	83720749	83725168	
Metal	tonne	44.56	94.02	15.62	154.2	3313945	842.8	54049.65	813.29	231.63	13182.34	0	0	102259.16	102413.36	

Annexure 2.4 (Contd.)

Mineral	Unit	Reserves				Remaining Resources								Total Resources (A+B)	
		Proved		Probable		Total	Feasibility	Pre-feasibility		Measured	Indicated	Inferred	Reconnaissance		Total (B)
		STD 111	STD 121	STD 122	STD 121	STD 211		STD 221	STD 222						
Titanium Minerals	tonne	13552280	0	868436	14420716	19311670	31365	117416	2198668	52373956	325171754	0	399204829	413625545	
Ilmenite	tonne	12980540	0	832970	13813510	17294168	0	0	1242214	41973121	280193087	0	340702590	354516100	
Rutile	tonne	558825	0	35466	594291	1099060	0	0	4460	3425835	9007516	0	13536871	14131162	
Leucoxene	tonne	0	0	0	0	624903	0	0	1994	0	341949	0	968846	968846	
Anatase	tonne	0	0	0	0	0	0	0	0	3345000	0	0	3345000	3345000	
Titaniferous Magnetite	tonne	0	0	0	0	293539	0	117416	950000	3630000	356229202	0	40620157	40620157	
Not Known		12915	0	0	12915	0	31365	0	0	0	0	0	31365	44280	
Tungsten															
Ore	tonne	0	0	0	0	2230000	0	173063	19611152	23435954	25356049	16581246	87387464	87387464	
Contained WO ₃	tonne	0	0	0	0	356800	0	45000	991400	2018092	10341515	456628	14209435	14209435	
Vanadium Ore	tonne	0	0	0	0	276530	1720000	4108100	0	232000	18297225	0	24633855	24633855	
Contained V ₂ O ₅	tonne	0	0	0	0	110612	2835	603240	0	4872	5413329	0	6459401	6459401	
Vermiculite	tonne	1582906	19413	30566	1632885	36411	26196	39794	58396	20179	538607	0	719582	2352467	
Wollastonite	tonne	1953384	48075	240003	2241462	3750118	12000	3748191	76088	3325042	3316385	0	14227824	16469286	
Zircon	tonne	1012205	146085	0	1158290	655020	0	105773	81741	377825	1044554	0	2264913	3423203	

figures rounded off.

Status of Mineral Rich States in Mineral Production (Excluding Atomic & Fuel Minerals)

Sl. No.	Name Of The State	Value Of Mineral Production In 2017-18 (Rs. In Crore)	% Change In Value As Compared To Previous Year	Leading Minerals Produced In The State *	Value Of Minor Minerals Production In 2017-18 (Rs. In Crore) #	No. Of Reporting Mines During 2017-18	Share Of The State In Country's Production Of Certain Minerals
1	2	3	4	5	6	7	8
1	Rajasthan	20887	7.00	Zinc Conc., Silver, Limestone, Lead Conc., Copper Conc., Phosphorite, Iron Ore, Wollastonite, Siliceous Earth, Manganese Ore, Garnet (Abrasive), Selenite	9868	81	Lead & Zinc Ore, Lead Conc., Selenite, Siliceous Earth, Wollastonite, Zinc Conc. are (100%), Silver (99.97%), Phosphorite (92.62%), Copper Conc. (43.22%), Copper Ore (31.56%), Limestone (21.87%), Garnet (Abrasive) (3.66%), Iron Ore (0.66%), Manganese Ore (0.29%).
2	Odisha	20177	25.29	Iron Ore, Chromite, Bauxite, Manganese Ore, Limestone, Garnet (Abrasive), Sillimanite, Graphite	86	130	Chromite (99.99%), Bauxite (51.31%), Iron Ore (50.85%), Graphite (43.73%), Sulphur (28%), Garnet (Abrasive) (21.61%), Sillimanite (20.45%), Manganese Ore (19.96%), Limestone (1.47%).
3	Andhra Pradesh	10465	1.74	Limestone, Garnet (Abrasive), Manganese Ore, Sillimanite, Iron Ore, Vermiculite	9353	130	Vermiculite (79.11%), Garnet (Abrasive) (70.43%), Sillimanite (65.84%), Limestone (11.49%), Manganese Ore (6.44%), Iron Ore (0.34%)
4	Chhattisgarh	9818	27.47	Iron Ore, Limestone, Bauxite, Tin Conc., Moulding Sand	634	109	Moulding Sand 100%, Tin Conc. (100%), Iron Ore (17.19%), Bauxite (11.47%), Limestone (10.74%)
5	Karnataka	9501	38.23	Iron Ore, Limestone, Gold (Primary), Gold, Manganese Ore, Magnesite, Silver, Limeshell	1321	140	Gold (99.51%), Gold Ore (99.16%), Iron Ore (14.29%), Manganese Ore (11.38%), Limestone (8.88%), Limeshell (6.98%), Magnesite (4.32%), Silver (0.03%)

* Except minor minerals.

Figures repeated due to non availability of data from State Governments.

TARGET AND ACHIEVEMENTS DURING THE FIVE YEARS OF XII PLAN (2012-2017) AND ANNUAL PLAN (2017-18 & 2018-19) OF GEOLOGICAL SURVEY OF INDIA

Name of the Scheme / Project / Programme	Target Vs Achievement FS 2012-13 (Apr'12-Mar'13)		Target Vs Achievement FS 2013-14 (Apr'13-Mar'14)		Target Vs Achievement FS 2014-15 (Apr'14-Mar'15)		Target Vs Achievement FS 2015-16 (Apr'15-Mar'16)		Target Vs Achievement FS 2016-17 (Apr'16-Mar'17)		Target Vs Achievement FS 2017-18 (Apr'17-Mar'18)		Target Vs Achievement FS 2018-19 (Apr'18-March'19)	
	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement	Target	Achievement
MISSION-I: BASELINE GEOSCIENCE DATA GENERATION														
a) Ground Survey														
Systematic Geological Mapping (sq. km)	1960	1289	2,000	2,640	700	600	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Spl. Thematic Mapping (sq. km.) (1:25,000 scale)	15,000@	21,566.50	18,000	20,411.5	18,000	20,307.9	16,875	19,741.50	9,230	9,146	14,000	18,369.5	20,000	23,319
Geochemical Mapping (in sq. km.) (1:50,000 scale)	46,000@	80,318	75,000	92,275.5	85,000	1,11,871	1,01,688	1,02,716	1,37,000	1,32,639	1,37,000	1,54,853.9	1,45,000	1,75,666
Geophysical Mapping (in sq.km.) (1:50,000 scale)	22,000	27,535	27,000	34,398	33,000	46,068	76,100	70,845	95,200	1,11,375	1,00,000	1,23,145.5	1,10,000	1,19,068
b) Aerial Survey														
(i) Multisensor / Aeromagnetic Survey* (with Twin Otter) (lkm)	25,000	#	30,000	52,380	33,000	0	51,735	58,583	60,000	61,352	60,000	1,67,779	43,221	1,08,023
(ii) Heliborne Survey (lkm)	10,000	\$	15,000	165	18,000	300	30,449	3,765	25,000	19,436.60	25,000	2,693	-	-
c) Marine Survey														
i) Parametric Survey within EEZ and beyond														
1) Bathymetry (lkm)	5,000	4,596	3,000	9,630	8,000	8,177	12,485	10,260	10,000	17,374	10,000	15,245	10,000	16,203
2) Magnetic (lkm)	1,700	3,923	3,000	5,531	10,000	3,829	10,060	8,419	10,000	8,833	11,000	14,076	12,000	8,582
3) Swath Bathymetry (Sq.km)	50,000	59,342	40,000	57,382	60,000	82,988	55,965	55,232	42,000	41,888	42,000	56,180	20,000	24,676
4) Seismic Survey (l. km) ^					7,000	3,188	7,450	1,993	5,000	3,949	5,000	5,971	4,000	3,562
5) Gravity (l. km) ^					20,140	17,014	18,300	16,958	16,000	16,550	16,000	11,404	15,000	20,125
6) Sub bottom Profiling (l. km) ^					13,485	14,393	14,925	16,070	15,000	15,587	15,000	17,642	9,000	4,212
ii) Systematic coverage within Territorial Water +EEZ (sq.km)	1,700	1,775	1,500	2,375	1,650	2,541	2,217	2,241	4,650	4,935	5,000	7,250	1,400	1,400

MISSION-II : NATURAL RESOURCE ASSESSMENT														
a) Large Scale Mapping (sq.km)	2,500	4,916.59	4,500	5,263.65	4,500	5,422.34	5,078.50	5,924.98	5,500	8,043.10	6,600	9,960.51	6,000	9,315.6
b) Detailed Mapping (sq.km)	40	45.43	50	62.525	50	73.9	58.59	106.03	103	145.63	110	112.3	125	166.8
c) Drilling (metre)	66,000	70,006.95©	70,000	68,037©	71,000	87,465.87©	8,5847	1,13,202	1,13,000	1,39,074.98©	1,15,000	1,29,710	1,20,000	115,697
d) Preliminary mineral investigation within EEZ(sq. km)					15000	16,225	15,000	15,819	25,000	32,358	30,000	37,710	24,000	25,634
MISSION-III : GEOINFORMATICS														
(Map, Publication, Information Technology, Core Library etc) (in nos)	30	30	30	30	30	30	62	62	35	35	40	22	40	43 initiated
MISSION-IV : FUNDAMENTAL AND MULTIDISCIPLINARY GEOSCIENCE														
(Geotechnical, Earthquake Geology & Seismology, Geo-environment, Glaciology, Geothermal etc.) (in nos)	91	89	85	81£	77	87	100	98	61	95	70	96	66	108
Research & Development Research (No of investigation including Deep Geol., Polar studies)	36	36	30	36	45	69	63	63	49	54	40	51	50	68
MISSION-V : TRAINING AND CAPACITY BUILDING														
Training (in GS/IT) No of Types (No of courses)	80	104	75	77	80	97	86	101	85	130	90	137	90	165

* Flying Season: normally in October - March
 # No Airborne survey conducted 2012-13 as Navigational system PNAV -2100 not working.
 \$ Sensors under installation to the helicopter
 @ Upward revision of target made with the induction of new officers in the Dept.
 £ Includes drilling under M-IV also.
 ¤ Four items were sponsored items and could not be taken up as there was no request from the Sponsor Agencies.
 ^ test flight over Aladahalil covering 165 Ikm.
 ^ Instrumentation on RV Samudra Ratnakar

Annexure-6.2 (Page 84)

**Mineral Wise Summary of Mining Lease Distribution of Minerals
(Excluding Atomic, Fuel & Minor Minerals) As on 31/03/2018(P) (All India)**

Sl. No.	State	No. of Leases	Lease area (Hect.)
1	Amethyst	3	6.63
2	Apatite	2	20.17
3	Aquamarine	1	24.29
4	Asbestos	1	49.22
5	Bauxite	387	28356.68
6	Borax	1	159.00
7	Chromite	32	8368.80
8	Copper ore	14	4253.68
9	Diamond	2	275.96
10	Emerald	1	46.32
11	Epidote	1	4.05
12	Flint stone	2	11.77
13	Fluorite	11	331.87
14	Garnet	109	1604.02
15	Garnet(gem)	2	38.22
16	Gold	11	7445.69
17	Graphite	51	1926.79
18	Iolite	12	188.71
19	Iron ore	488	73556.93
20	Kyanite	28	1439.88
21	Lead & zinc ore	11	6657.16
22	Limeshell	24	2779.88
23	Limestone	2046	164533.57
24	Magnesite	38	2434.05
25	Manganese ore	291	14553.37
26	Marl	3	13.45
27	Moulding sand	8	37.02
28	Perlite	1	144.88
29	Phosphorite	10	2057.52
30	Rock phosphate	1	13.20
31	Rock salt	1	8.12
32	Ruby	1	27.66
33	Sapphire	1	673.40
34	Semi-precious stones	15	183.20
35	Siliceous earth	44	314.03
36	Sillimanite	6	563.01
37	Stibnite	1	40.47
38	Tin	14	302.77
39	Vermiculite	97	1801.18
40	White clay	8	77.54
41	White shale	38	220.94
42	Wollastonite	16	331.10
	Total	3834	325876.2

Excludes the mining leases of the Atomic minerals, Coal, Lignite, Petroleum, Natural Gas and Minor minerals. (P) : Provisional
Source:- Respective State Govt Deptt/ Directorate of Geology and Mining Deptt. * Note:- Date received from respective regional offices of IBM have also been taken in account wherever necessary.

Annexure-8.1 (Page 117)

List of projects approved in 2018-19

S.N.	Project Title	Project Cost (Rs. lakh)	Amount released* (Rs. lakh)
1.	Assessment of Udaipur rock phosphate, low grade potassium feldspar and lignite mine waste for the development of organo-mineral fertilizer formulations,	24.9225	7.875
2.	Bench scale study on extraction of pure Silica and smelter grade Aluminium Fluoride from Coal Fly Ash (CFA)	63.026	38.205
3.	Characterization and Beneficiation of Lithium Bearing Minerals from Indian Deposits.	15.00	8.57
4.	Development of capacitive deionization technology for the extraction of germanium and selenium: Two elements of strategic relevance.	29.61	13.10
5.	Integrated Geological, Geochemical and Geophysical studies for the delineation of Chromitite extensions in Nuggihalli Schist Belt and implications for Ni-Cu+-PGE mineralization.	60.00	14.00
6.	Treatment of Acid Mine Drainage for Heavy Metal Removal,	19.8397	16.02
7.	Development of grapheme based membranes from graphite ore for desalination.	60.00	26.73
8.	Recovery of scandium metal from acid leach liquor from titanium mineral industries.	32.92	8.73
9.	Improving fracture resistance of rocks through adhesive bonding for underground mining application.	14.73467	13.9571
10.	Development of a Low-cost Portable Optical Reflectance Spectrometer for Mining and Mineralogy.	10	6.10
11.	Novel Approach to Recover Individual Valuable Heavy Minerals from Pyriboleferrous Beach and Dune Sand Deposits	15	6.775
12.	Investigation of the dynamics & mechanism of flocculation by polymers and biopolymers for separation of solid particles of high rate thickeners in mineral processing industries.	60	22.433
13.	Use of Overburden Clay as alternate for aggregate	178	35.00
14.	Texturally controlled micro-chronological and extraction protocol studies on Pt-Chromite mineralization-Preliminary Studies	8	3.35
15.	Development of Ready-To-Use Assorted Sand for Construction Activities from Zinc Refining Wastes and Marble Powder	20	14.007
16.	To study the fire retardancy of nano-ATH in polymers	56.98	5.61
17.	Techno-economic Survey of Aluminium Scrap Recycling in India	53.55	20.50
18.	High performance of rare earth metal as Electrode material for super-capaciter application and fuel cell	30.96944	23.73054
19.	Development of open cell aluminium foams for heat sink and EMI shielding Application	30	4.72
	Total	782.5523	289.4126

Annexure 14.1 (Page 178)

List of Nodal Officer, CPIOs and Appellate Authorities in Ministry of Mines

(As on 31st March, 2019)

Nodal Officer (RTI)	CPIO (RTI)
Shri Rakesh Moza Deputy Secretary Room No.: D-313, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23383096 E-mail : rakesh.moza@nic.in	Smt. Rima Puri Section Officer Room No.: D-301, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23384225 E-mail : rimapuri.59@nic.in

Sl. No.	CPIO	Subject matter dealt (Section)	Appellate Authority
1.	Shri Yogesh R. Patel, Under Secretary Room No.: D-303, III Floor, Shastri Bhawan Tel No. : 23383946 E-mail : yogesh.patel77@gov.in	Establishment	Shri Shersha, Director Room No.: D-309, III Floor, Shastri Bhawan Tel No. : 23381172 E-mail : shersha.mohideen@nic.in
		Administration	
		Cash	
		R&I Section	
		Records	
2.	Smt Lakshmi Subramanian, Under Secretary Room No.: D-303, III Floor, Shastri Bhawan Tel No. : 23387223 E-mail : lakshmi.s@nic.in	Vigilance	Smt. Farida M. Naik, Director Room No.: D-312, III Floor, Shastri Bhawan Tel No. : 23384593 E-mail : fm.naik@nic.in
		Metal-II	
		Metal-III	
3.	Shri Adhir Kumar Mallik, Under Secretary Room No.: D-314, III Floor, Shastri Bhawan Tel No. : 23384743 E-mail : ak.mallik@nic.in	Mines-VI	Dr. D. Veena Kumari, Director Room No.: D-308, III Floor, Shastri Bhawan Tel No. : 23388345 E-mail : veena.kumarid@nic.in
		DMF & PMKKKY	Shri Sanjeev Verma, Director Room No.: D-315, III Floor, Shastri Bhawan Tel No. : 23070260 E-mail : sanjeev.verma79@gov.in
		Mines V	Dr. D. Veena Kumari, Director Room No.: D-308, III Floor, Shastri Bhawan Tel No. : 23388345 E-mail : veena.kumarid@nic.in
		Mines IV	Shri Sanjeev Verma, Director Room No.: D-315, III Floor, Shastri Bhawan Tel No. : 23070260 E-mail : sanjeev.verma79@gov.in
		Metal-I	Shri Amit Saran, Director Room No.: D-306, III Floor, Shastri Bhawan Tel No. : 23381136 E-mail : amit.saran@nic.in

4.	Ms. Kirti, Deputy Director Room No.: D-303, III Floor, Shastri Bhawan Tel No. : 23380610 E-mail : kirti.15@gov.in	ES & IT (GST, Skill Development & Economic matters)	Ms. Athira S. Babu, Director Room No.: D-311, III Floor, Shastri Bhawan Tel No. : 23073046 E-mail : athira.babu@gov.in
		Trade issues (FTAs) & economic inputs on matters concerned through respective section	
		Mines-IV (Sand Mining & Auctions monitoring (including 2020 MLs))	Shri Sanjeev Verma, Director Room No.: D-315, III Floor, Shastri Bhawan Tel No. : 23070260 E-mail : sanjeev.verma79@gov.in
5.	Shri Ajoy Kumar Kadian, Under Secretary Room No.: A-349, III Floor, Shastri Bhawan Tel No. : 23389513 E-mail : ajay.kadian@nic.in	Mines III	Shri Amit Saran, Director Room No.: D-306, III Floor, Shastri Bhawan Tel No. : 23381136 E-mail : amit.saran@nic.in
		Coordination & Parliament	Shri Shersha, Director Room No.: D-309, III Floor, Shastri Bhawan Tel No. : 23381172 E-mail : shersha.mohideen@nic.in
		International Cooperation	Shri Amit Saran, Director Room No.: D-306, III Floor, Shastri Bhawan Tel No. : 23381136 E-mail : amit.saran@nic.in
6.	Shri Bhimrao Daulat Sapkale Under Secretary Room No.: Tel No. : E-mail : bdsapkale@gmail.com	Mines II	Smt. Farida M. Naik, Director Room No.: D-312, III Floor, Shastri Bhawan Tel No. : 23384593 E-mail : fm.naik@nic.in
		Revision Cell	Shri H. K. Mallick, Deputy Secretary Room No.: D-314, III Floor, Shastri Bhawan Tel No. : 23070376 E-mail : hk.mallick@nic.in
7.	Shri Birendra Singh Rawat, AD (OL) Room No.: D-305, III Floor, Shastri Bhawan Tel No. : 23383085 E-mail : bs.rawat62@nic.in	Hindi (OL)	Shri Alok Chandra, Economic Adviser Room No.: 308-A Wing, III Floor, Shastri Bhawan Tel No. : 23384592 E-mail : ea-mines@gov.in

8.	Shri Vikas Raj, Under Secretary	Mines-I	Shri Joyesh Bagchi, Director (T) Room No.: D-310, III Floor, Shastri Bhawan Tel No. : 23385329 E-mail : dirtech.mom@nic.in
		Metal IV	Shri H. K. Mallick, Deputy Secretary Room No.: D-314, III Floor, Shastri Bhawan Tel No. : 23070376 E-mail : hk.mallick@nic.in
9.	Shri Ravinder Kumar, SO Room No.: A-338, III Floor, Shastri Bhawan Tel No. : 24363632 E-mail : if.dom@nic.in	IF Section	Shri Rakesh Moza, Deputy Secretary Room No.: D-313, III Floor, Shastri Bhawan Tel No. : 23383096 E-mail : rakesh.moza@nic.in
10.	Shri Rajendra Prasad, Deputy Director Room No.: 114-F Wing, I Floor, Shastri Bhawan Tel No. : 23384741 E-mail : rajendrprasad.gsi@gov.in	NMET Cell	Shri Pradeep Singh, Director Room No.: 114-F Wing, I Floor, Shastri Bhawan Tel No. : 23384741 E-mail : pradeep.singh.gsi@gov.in



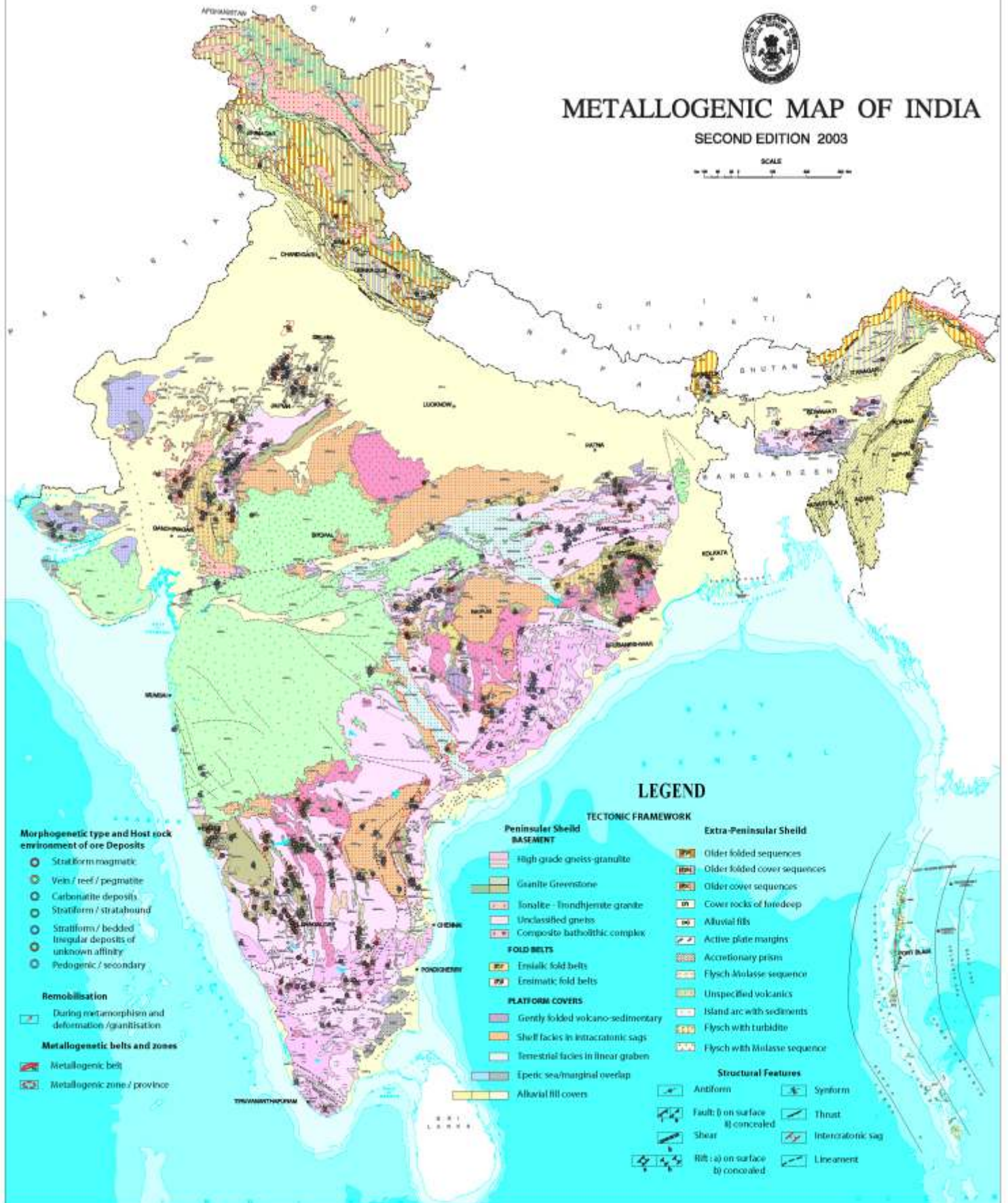
UnchabaliFeMine-mining-quarry



METALLOGENIC MAP OF INDIA

SECOND EDITION 2003

SCALE
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सत्यमेव जयते

Government of India
Ministry of Mines

Shastri Bhawan, Dr. Rajendra Prasad Road, New Delhi-110001
Website: <http://mines.gov.in>