



Digital India

Government of India

2020-21 Annual Report

Ministry of Mines

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Ministry of Mines Government of India

Ministry of Mines

Geological Survey of India

Indian Bureau of Mines

National Aluminium Company Limited

Hindustan Copper Limited

Mineral Exploration Corporation Limited

Jawaharlal Nehru Aluminium Research Development and Design Centre

National Institute of Rock Mechanics



https://mines.gov.in



www.gsi.gov.in



www.ibm.nic.in



www.nalcoindia.com



www.hindustancopper.com



www.mecl.co.in



www.jnarddc.gov.in



www.nirm.in

Annual Report 2020-21

Abbreviations

AAS	Atomic Absorption Spectrophotometer
ACR	Annual Confidential Report
AIMS	Aluminium Import Monitoring System
APAR	Annual Performance Appraisal Report
ASTER	Advanced Space borne Thermal Emission and Reflection Radiometer
BEE	Bureau of Energy Efficiency
BGML	Bharat Gold Mines Limited
BISAG	Bhaskaracharya Institute for Space Applications and Geo-informatics
BSE	BSE - Bombay Stock Exchange
СВМ	Coal Bed Methane
ССоМ	Chief Controller of Mines
CEMS	Continuous Emission Monitoring Systems
CETP	Common Effluent Treatment Plant
CGPB	Central Geological Programming Board
CGWB	Central Ground Water Board
СНQ	Central Head Quarter
CHWTSDF	Common Hazardous Waste Treatment, Storage & Disposal Facility
CII	Confederation of Indian Industry
CIMFR	Central Institute of Mining and Fuel Research
CMFRI	Central Marine Fisheries Research Institute, Kochi
CMPDI	Central Mine Planning & Design Institute
СРСВ	Central Pollution Control Board
CPGRAMS	Centeralised Public Grievance Redressal and Monitoring System
CSR	Corporate Social Responsibility
CUSAT	Cochin University of Science and Technology, Kochi

DGM	Directorate of Geology & Mining
DGMS	Directorate General of Mines Safety
DMF	District Mineral Foundation
DRM	District Resources Maps
EC	Environmental Clearance
EEZ	Exclusive Economic Zone
EIA	Environment Impact Assessment
EPMA	Electron Probe Micro Analyser
EPS	Enterprises Procurement System
ERP	Enterprise Resource Planning
FC	Forest Clearance
FDP	Forest Diversion Proposal
FMCP	Final Mine Closure Plan
FROF	First Right of Refusal
FS	Field Season
FTS	File Tracking System
FY	Financial Year
GCM	Geochemical Mapping
GDP	Gross Domestic Product
GEM	Government e-Market
GIGW	Guidelines for Indian Government Websites
GPM	Geophysical Mapping
GPR	Ground Penetration Radar
GQM	Geological Quadrangle Maps
GR	Geological Report
GSI	Geological Survey of India
GSITI	Geological Survey of India Training Institute
HCL	Hindustan Copper Limited
HINDALCO	Hindustan Aluminium Company Limited
HR-SIMS	High-Resolution Secondary Ion Mass Spectrometer

IBAAS	International Bauxite, Alumina and Aluminium Society
IBM	Indian Bureau of Mines
ICC	Indian Copper Complex
ICSG	International Copper Study Group
ICNFMM	International Symposium Non-ferrous Minerals & Metals
ICT	Information and Communication Technology
IEBR	Internal and Extra Budgetary Resources
IEC	Information Education and Communication
IGC	International Geological Congress
IMD	Indian Meteorological Department
IMYB	Indian Mineral Year Book
ISRO	Indian Space Research Organisation
ITEC	Indian Technical Economic Cooperation
ITM	Integrated Thematic Mapping
JNARDDC	Jawaharlal Nehru Aluminium Research Development and Design Centre
JV	Joint Venture
JWG	Joint Working Group
KABIL	Khanij Bidesh India Limited
КСС	Khetri Copper Complex
KMS	Knowledge Management System
KPA	Key performance Area
LEWS	Landslide Early Warning System
LME	London Metal Exchange
MCDR	Mineral Conservation & Development Rules
МСР	Malanjkhand Copper Project
MCR	Mineral Concession Rules
MDRD	Minerals Development & Regulation Division
MECL	Mineral Exploration Corporation Limited
ML	Mining Lease

MMDR Act	Mines & Minerals (Development and Regulation) Act, 1957
MNRE	Ministry of New and Renewable Energy
MoC	Ministry of Coal
MoEFCC	Ministry of Environment, Forest and Climate Change
MOIL	Manganese Ore India Limited
МоМ	Ministry of Mines
MoU	Memorandum of Understanding
MPD	Mineral Processing Division
MSDE	Ministry of Skill Development and Entrepreneurship
MSMP	Monthly Statistics of Mineral Production
MSS	Mining Surveillance System
MT	Magnetotelluric
MTS	Mining Tenement System
NALCO	National Aluminium Company Limited
NER	North Eastern Region
NFTDC	Non-Ferrous Materials Technology Development Centre
NGCM	National Geochemical Mapping
NGDR	National Geoscience Data Repository
NIIST	National Institute for Interdisciplinary Science and Technology, Thiruvananthapuram
NIMH	National Institute of Miners' Health
NIRM	National Institute of Rock Mechanics
NLCIL	Neyveli Lignite Corporation India Limited
NLSM	National Landslide Susceptibility Mapping
NMEP	National Mineral Exploration Policy
NMET	National Mineral Exploration Trust
NMH-II	National Mission Head-II
NMI	National Mineral Inventory
NMP	National Mineral Policy
NPCIL	Nuclear Power Corporation of India Limited

NRSC	National Remote Sensing Centre
NRTC	NALCO Research & Technology Centre
NSDC	National Skill Development Corporation
NSE	National Stock Exchange
OAMDR	Offshore Areas Mineral (Development & Regulations) Act, 2012
OCBIS	Online Core Business Integrated System
OGP	Obvious Geological Potential
OL	Official Language
OLIC	Official Language Implementation Committee
OREDA	M/s Orissa Renewable Energy Development Agency
OSPCB	Odisha State Pollution Control Board
PERC	Project Evaluation and Review Committee
PGE	Platinoid Group of Elements
PGRS	Photo Geology and Remote Sensing
PL	Prospecting Licence
РМСР	Progressive Mine Closure Plan
РМКККҮ	Pradhan Mantri Khanij Khsetra Kalyan Yojana
PRAGATI	Pro-Active Governance and Timely Implementation
PWDs	Persons with Disabilities
REE	Rare Earth Elements
REIL	Rajasthan Electronics & Instruments Plant
RESCO	A Renewable Energy Service Company
RMDS	Regional Mineral Development Studies
RP	Reconnaissance Permit
RSAC	Research & Scientific Advisory Committee
RSAS	Remote Sensing and Aerial Survey
RTI	Right to Information
R&D	Research & Development
SAIL	Steel Authority of India Ltd.

SCMS	Skill Council for the Mining Sector
SCSP	Special Component Plan for Scheduled Caste
SDF	Sustainable Development Framework
SDGs	Sustainable Development Goals
SEM	Scanning Electron Microscopy
SGM	Systematic Geological Mapping
SGPB	State Geological Programming Board
SoP	Standard Operating Procedure
SSAG	Standing Scientific Advisory Group
SSAMS	Single Stage Accelerated Mass Spectrometer
STM	Specialised Thematic Mapping
STP	Sewage Treatment Plant
STQC	Standardisation Testing and Quality Certification
SU	State Unit
TAMRA	Transparency, Auction Monitoring and Resource Augmentation
TAMRA TCC	Transparency, Auction Monitoring and Resource Augmentation Technical-cum-Cost Committee
TAMRA TCC TEFR	Transparency, Auction Monitoring and Resource Augmentation Technical-cum-Cost Committee Techno-Economic Feasibility Report
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Contents

S. No.	Chapters	Page No.
1.	<u>An Overview</u>	1-11
2.	Minerals and Metals in the Country	13-22
3.	Legislative Framework, Mineral Policy and Implementation	23-37
4.	Revenue from Mineral Resources	39-44
5.	International Co-operation	45-50
6.	Attached / Subordinate offices	51-88
7.	Central Public Sector Undertakings	89-134
8.	Science, Technology and Autonomous Bodies	135-146
9.	Corporate Social Responsibility	147-153
10.	Progressive Use of Hindi	155-162
11.	Exploration Activities in the North-Eastern Region	163-172
12.	Welfare Activities for SCs/STs, Women, Minorities & Persons with Disabilities.	173-180
13.	Budget and Audit Paras	181-188
14.	Miscellaneous	189-204
	Annexures	205



Sukinda Chromite Ore Mine

Annual Report 2020-21

<u>Ministry of Mines :</u> <u>An Overview</u>

Annual Report 2020-21

1

Ministry of Mines : An Overview

Ministry of Mines

Ministry of Mines An Overview

•	Vision	Page - 3
•	Role and Organization of the Ministry	Page - 3
•	List of Subjects Allocated to the Ministry	Page - 3
•	Organisational Structure	Page - 4
•	Major Highlights / Achievements of Ministry of Mines	. Page- 5

Annual Report 2020-21

1.1 Vision

- (i) India is well endowed with natural resources, particularly minerals, which serve as raw material for many industries, paving a path for rapid industrialisation and infrastructural development. This, in turn, will facilitate the economy's ascent to a path of sustained growth and a five trillion-dollar economy.
- (ii) During last six years, the Government has introduced important reforms to open up the mineral sector to ensure its contribution in achieving the national policy goals. Major reforms include enactment of the Mines and Mineral (Development & Regulations) (MMDR) (Amendment) Act, 2015, which made the process of allocation of mineral concessions completely transparent by introducing public auctions with active participation of the State Governments. In the federal set up, States are owners of mineral wealth in their respective territories. For realising the benefits of mineral wealth, States have primary and significant role to come up with auctionable mineral blocks that have clearance, to start production.
- (iii) The Vision is to double the production of important minerals in next 5 years with resultant reduction in import dependency, by allocating and regulating minerals in a transparent and sustainable manner and to promote exploration and mining of deep-seated minerals to meet country's needs and to effectively implement other policy goals stated

in the National Mineral Policy, 2019, thereby enabling the country to progress towards attaining self-sufficiency in major mineral production.

Role and Organisation of the Ministry

Main Functions

1.2 Ministry of Mines is responsible for survey, 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 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 related to mineral wealth 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 the 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 Aluminium Company Limited (NALCO), Bhubaneswar;
- Hindustan Copper Limited (HCL), Kolkata; and
- Mineral Exploration Corporation Limited (MECL), Nagpur

Autonomous Bodies

1.6 There were three Research Institutions

which are Autonomous Bodies of this Ministry at the start of year 2020-21:

- 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.

However, NIMH merged/ has been amalgamated with ICMR - National Institute Occupational Health (Ahmadabad), of Ministry of Health & Family Welfare with all assets and liabilities. NIMH has been dissolved and deregistered under Karnataka Societies Registration Act, 1960 w.e.f. 23.07.2020. Therefore, at present, there are two Research Institutions (which are Autonomous Bodies) of this Ministry viz. JNARDDC and NIRM.

Organisational Structure

1.7 The Ministry of Mines is headed by Shri Pralhad Joshi as the Minister of Mines, during the period of the report. Shri Pralhad Joshi assumed the charge, after the formation of new Government, on 31st May, 2019, along with Parliamentary Affairs and Coal.

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 Nine Directors/Deputy Secretaries, one Director (Economic Service), one Deputy Director (OL), one Assistant Director of IES, one Assistant Director (OL). 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**.

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			
Croup			SC	ST	OBC	Minority	Women	VH	нн	ОН
Group-A Gazetted	34	33	03	02	04	01	05	-	-	01
Group-B Gazetted	37	21	04	02	01	01	07	01	-	-
Group-B Non- Gazetted	56	42	12	06	11	01	08	-	-	01
Group-C	87	42	07	01	01	01	03	-	-	01
Total	214	138	26	11	17	04	23	01	-	03

Table 1.1Information in r/o Secretariat proper employees as on 31st December, 2020

Contribution of Mining and Quarrying Sector to the Gross Value Added (GVA) of the Nation

1.9 As per the Estimates of GDP for the second quarter released by the National Statistical Office, Ministry of Statistics and Program Implementation, the contribution of the mining and quarrying sector in the estimated Gross Value Added (GVA), at 2011-12 prices, for the Q2 of 2020-21 was 2.06%,

which is near to the level of 2.10% in Q2 of 2019-20. At the current prices, the share in Q2 of 2020-21 is 1.45%, which is close to the share of 1.70% in Q2 of 2019-20. GVA contribution of mining and quarrying sector, at 2011-12 prices, for the H1 of 2020-21 was 2.39%, which is near to the level of 2.46% in H1 of 2019-20. At the current prices, the share in H1 of 2020-21 is 1.58%, which is close to the share of 2.02% in H1 of 2019-20. The details are in **Table 1.2**.

Table 1.2Gross Value Added (GVA): Share/Contribution of Mining and Quarrying (%)

Period	At 2011-12 price	At current price
Q2 (July- September), 2020-21	2.06	1.45
Q2 (July- September), 2019-20	2.10	1.70
H1 (April- September), 2020-21	2.39	1.58
H1 (April- September), 2019-20	2.46	2.02

Source: MoSPI, Press Note on Estimates of GDP for the second quarter (July-September), 2020-21. Statement Nos. 1, 3, 5 & 7.

1.10 Major Highlights/Achievements of Ministry of Mines

1.10.1 Mineral Laws (Amendment) Act, 2020 (No. 2 of 2020) was notified on 13^{th}

March, 2020 for replacing Mineral Laws (Amendment) Ordinance, 2020, which was promulgated on 10.01.2020. In order to implement the amended provisions of the MMDR Act, the Mineral Auction (Amendment)

Rules, 2020 and Minerals (Other than Atomic and Hydrocarbon Energy Minerals) Concession (Amendment) Rules, 2020 were notified on 20.02.2020. These amendments were made for early operationalization of the mineral blocks auctioned & to also facilitate transfer of all the valid clearances of the old lessee to new lessee up to a period of two years for mining leases expiring under the provisions of the Sections 8A(5) and (6) of the Act. In effect, all the brownfield mining blocks will benefit through this amendment. Further, Ministry of Environment, Forest and Climate Change (MoEF&CC) has also issued notification for Environment Clearance (EC) on 28.03.2020 and guidelines for Forest Clearance (FC) on 31.03.2020 in line with the Mineral (Auction) Amendment Rules. 2020 after detailed discussions with the concerned stakeholders.

1.10.2 The Ministry of Mines is also in the process of bringing amendment in the Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act) for structural reforms in mining sector. Draft Bill in this regard has been approved by the Cabinet on 13.01.2021, which will be placed for consideration of the Parliament in forthcoming Budget Session, 2021.

1.10.3 Ministry of Mines, MoEF&CC and State Governments have taken several steps to prevent disruption in production and supply of minerals and raw materials on account of expiry of leases on 31.03.2020 and recent granting of new leases. These steps include amendment to MMDR Act, Mineral Auction Rules 2015, Mineral (Other than Atomic & Hydrocarbon Energy Minerals) Concession Rules, 2016 etc. In view of extraordinary situation due to COVID-19, Ministry of Mines on 22.04.2020 has recommended to State Governments to annualize the upfront

payment needed for execution of lease. Regarding the annualization of the payment of stamp duty, State Governments have been asked to consider the request. Further, MoEF&CC has also been requested to consider annualizing the payment of Net Present Value (NPV) for issuance of Forest Clearance.

1.10.4 Since the amendment to MMDR Act, 1957, a total of 105 mineral blocks have been auctioned so far across 9 States. The estimated revenue to the State Governments over the lease period of these auctioned mines is Rs.8,27,982 Cr. So far, mining lease has been executed for 34 auctioned mines and 17 auctioned mines are in production and 1 mine granted for composite license is also operational.

1.10.5 46 working mining leases got expired on 31.03.2020 under Section 8A(6) of the MMDR Act, 1957. The major impact on production of minerals was from the mineral blocks expired in Odisha (24) and Karnataka (7). Pursuant to recent amendments in Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act) to facilitate seamless transfer of mining leases to new lessee, mining lease has been executed for 19 mines in Odisha and 10 mines have started production. Karnataka has also executed 4 Mining leases which have started production. 2 mineral blocks are ready for auction in Andhra Pradesh & Gujarat. 12 mineral blocks are under exploration in Jharkhand, Karnataka and Rajasthan. 3 mineral blocks will be reserved for PSU and 1 mine has gap period issue.

1.10.6 To facilitate processes that help ease of doing business and to boost investments in the country, this Ministry has issued guidelines for auction of mineral blocks with pre-embedded clearances for mining projects

on 03.06.2020. Further, Secretary (Mines) have also written to the Chief Secretaries of Gujarat, Karnataka, Madhya Pradesh, Odisha & Rajasthan to identify 5 mineral blocks and expedite the auction of mineral blocks with pre-embedded clearances. A list of prospective mineral blocks explored by GSI has also been shared with States.

1.10.7 Two orders under section 20A of the MMDR Act were issued on 03.12.2020 for (i) allowing SAIL to sell 25% of total production calculated on the basis of cumulative production of captive mines of SAIL in consultation with the State Government and (ii) allowing to sell the sub-grade minerals lying at the mine pit heads of captive mines of SAIL in consultation with the State Government to maintain the availability of iron ore in the market and considering the economic rationale.

1.10.8 The long pending issue of Donimalai iron ore mine of NMDC in Karnataka, which was suspended since November, 2018, has finally concluded through the endeavour of the Ministry of Mines. The Karnataka Government has issued order on 01.12.2020 permitting NDMC Ltd. to restart mining operations at its Donimalai mines in Bellary District, Karnataka. The operationalization of the Donimalai iron ore mines, which has an estimated resource of 149 MT, will increase the annual iron ore production in the country by 7 MTPA. It will contribute around Rs. 1100 crore to the State exchequer per annum and will take the country a step closer towards the vision of the Government to achieve 300 MTPA crude steel capacity by 2030-31.

1.10.9 Pradhan Mantri Khanij Kshetra Kalyan Yojana (PMKKKY) is being implemented through the funds collected under DMF and as on November, 2020, Rs.43,271.47 Cr was

collected, Rs.40,753.63 Cr stands allocated and Rs. 18,836.35 Cr has been spent. Total 1,91,725 projects have been sanctioned under the scheme.

1.10.10 State Governments are continuing to use District Mineral Foundation (DMF) funds to combat COVID-19 wherein Rs.497.72 crore has been spent upto 31.12.2020. Details in this regard are at <u>Annexure 1.2</u>.

1.10.11 Ministry of Mines has set a target of Rs.3,000 crore for expenditure under Garib Kalyan Rojgar Abhiyan (GKRA) through works done under District Mineral Foundation (DMF). Projects under the Abhiyan are already sanctioned. Till the completion of Abhiyan on 23.10.2020, a total of 7,583 projects amounting to Rs.1042.82 crore were completed. 50974 person days were generated during Abhiyan period. Funds required for expenditure through DMF are already available with districts. Regular follow up was carried out by the Ministry officials through regular teleconferences and weekly Video Conferences with the States.

1.10.12 National Non-Ferrous Metal Scrap Recycling Framework, 2020 has been published on 06.01.2021 to promote a formal and well-organized recycling ecosystem by adopting energy efficient processes for recycling leading to lower carbon footprints and to work towards sustainable development and intergenerational equity, and to shift towards a circular economy in the coming years for base metals, critical raw materials and other essential materials.

1.10.13 Ministry of Mines has approved "Non Ferrous Metal Import Monitoring System" (NFMIMS) to monitor the import of Aluminium & Copper, including scrap, in the country. The purpose of NFMIMS is to



have adequate information with regard to import of Aluminium and Copper so that an appropriate policy intervention could be devised well in time.

1.10.14 A 200 bedded exclusive COVID 19 hospital at Nabarangpur, funded by NALCO was inaugurated by Hon'ble Chief Minister of Odisha in presence of Hon'ble Union Minister of Parliamentary Affairs, Coal and Mines (Joined through video conferencing) on 20.04.2020. This hospital facility includes a 10 bedded ICU with oximetry along with 24-hour diagnostic facility etc. It will provide round the clock facilities to the patients of undivided Koraput district with high tribal population and help in combating COVID-19 cases.

1.10.15 Shri Pralhad Joshi, Hon'ble Union Minister for Coal, Mines and Parliamentary Affairs launched SATYABHAMA (Science and Technology Yojana for Aatmanirbhar Bharat in Mining Advancement) Portal for Science and Technology Programme Scheme of Ministry of Mines on 15th June, 2020. In contrast to present system where research proposals are submitted physically by the scientists/ researchers, SATYABHAMA portal will allow online submission of project proposals along with monitoring of the projects and utilization of funds/grants. The researchers can also submit progress reports and Final Technical Reports of the projects in the electronic format in the portal. The portal is integrated with NGO Darpan Portal of NITI Aayog. The SATYABHAMA Portal can be accessed at research.mines.gov.in. All the research project details and final reports will be available on the portal.

1.10.16 Hon'ble Minister of Coal, Mines & Parliament affairs, Shri Pralhad Joshi along with officers of Ministry of Mines and Ministry

of Coal visited Ranchi & Raipur on 30/31 July 2020, and Bangalore on 28.08.2020. During these visits, important issues, including issues related to extension of Surda mines of HCL (Jharkhand), extension of Mining lease of Donimalai mines of NMDC, issues related to BGML and other issues related to coal and mining sector were discussed with concerned Hon'ble Chief Ministers of the States. Hon'ble Chief Ministers of these States assured to expedite action on the issues discussed. Hon'ble Union Minister also assured that all issues raised by the States will be taken care of.

1.10.17 A meeting was taken by Hon'ble Union Minister of Coal, Mines and Parliamentary Affairs Sh. Pralhad Joshi with Hon'ble Union Minister of Petroleum & Natural Gas and Steel Sh. Dharmendra Pradhan and Hon'ble Chief Minister Government of Odisha Sh. Naveen Patnaik on 09.12.2020 to discuss various issues related to mining sector, especially the supply of raw materials, such as iron ore.

1.10.18 A meeting was held between Minister of Coal, Hon'ble Mines and Parliamentary Affairs, Shri Pralhad Joshi and Hon'ble Minister for Resources, Water and Northern Australia, Government of Australia, Mr. Keith Pitt MP through video conferencing on 11.09.2020. Hon'ble Union Minister emphasised about the geological similarity between India and Australia being part of Gondwana land, mentioned about the enhanced need for cooperation and collaboration between both countries in the areas of exploration and mining of mineral resources. He mentioned that Khanij Bidesh India Limited (KABIL) has been established with a primary objective to secure availability of 12 critical and strategic minerals from

overseas through mineral acquisition. KABIL has shortlisted Lithium & Cobalt as the most critical & strategic minerals in terms of their importance & supply risk, and requirement of cooperation with Australia as these two minerals are available abundantly in Australia. He further mentioned that a Memorandum of Understanding (**MoU**) between the Government of India and Government of Australia has been signed on 3rd June, 2020 on cooperation in the field of mining and processing of critical and strategic minerals. He extended invitation to Mr. Keith Pitt MP to visit India once the prevailing situation due to COVID-19 normalizes.

1.10.19 A document on "Strategic plan for REE exploration in India" (November 2020 edition) has been jointly released by GSI and AMD for exploration and research, and uploaded on GSI-OCBIS portal.

1.10.20 Geological Survey of India (GSI) has started testing Regional Landslide Early Warning System (LEWS) in Darjeeling district, West Bengal and Nilgiris district, Tamil Nadu, w.e.f. 27.07.2020. This system will be tested in both these locations for few monsoon years for validation before making it operational. Like a few other developed countries, where such type of regional landslide early warning model is already operational, India will also carry out extensive ground validation and testing of the prototype LEWS models for a few monsoon years, including testing in eight other landslide prone States too in phases till 2025, before making it operational nationwide. GSI has developed this technology through an ongoing collaborative international research program- LANDSLIP after working with a large group of Indian and European scientists from Landscape, Climate and Social dynamics fields.

1.10.21 The 36th International Geological Congress (36IGC), scheduled to be held during 2nd to 8th March, 2020 was postponed due to Corona virus risks and would be held now from 16th August, 2021 to 21st August, 2021. The Ministry had to make intensive efforts to convince IUGS to not cancel the event altogether.

1.10.22 An MoU between the Geological Survey of India (GSI), and the Geological Survey of Brazil – CPRM (GSB–CPRM), Ministry of Mines and Energy of the Federative Republic of Brazil was signed at New Delhi on 25th January, 2020 on cooperation in the field of Geology and Mineral Resources for an initial period of five years during the State Visit of Hon'ble President of the Federative Republic of Brazil to India. 1st meeting of the Joint Working Group constituted under the MoU was held on 12.11.2020 through video-conferencing.

1.10.23 A Memorandum of Understanding (MoU) was signed between the Ministry of Mines, the Government of the Republic of India and Department of Industry, Science, Energy and Resources for Australia, the Government of Australia on cooperation in the field of mining and processing of critical and strategic minerals for an initial period of five years and exchanged during the India-Australia Leaders' virtual summit between Hon'ble Prime Minister of India and Australian Prime Minister through Video Conference held on 4^{th} June, 2020. 1^{st} meeting of the Joint Working Group constituted under the MoU was held on 26.11.2020 through videoconferencing.

1.10.24 Geological Survey of India (GSI) has signed a Memorandum of Understanding (MoU) with Geological Survey of Finland (GTK) on 03.12.2020. The Director General,

GSI and Mr. Mika Nykanen, Director General, GTK signed the agreement in the fields of various aspects of Geology and Mineral Resources. GSI signed another MoU with India Meteorological Department, Ministry of Earth Sciences on Institutional Cooperation Program on landslide studies towards developing regional landslide early warning system for the country on 30.12.2020.

signed the **1.10.25** KABIL first MoU with Jujuy Energía Y Minería Sociedad Del Estado (JEMSE), a state-owned enterprise of JUJUY province of Argentina on 10th July, 2020. The signing ceremony of the MoU was held through VC in the presence of HE Governor of Jujuy Province of Argentina, President of JEMSE and other officials of Federal Government of Argentina. The Indian side was represented by Secretary, Ministry of Mines along with officials of Ministry of Mines and External Affairs and CEO of KABIL. The MoU entails sharing of the data on prospective mineral assets of Lithium, Cobalt and others such minerals located in JUJUY province of Argentina, so as to evaluate feasibility of exploration and exploitation of the resources through acquisition of mineral assets. This would involve a process of joint identification of prospects in Lithium and Cobalt mining in JUJUY province of Argentina.

1.10.26 A Memorandum of Understanding (MoU) was signed on 29.12.2020 for strategic partnership between Catamarca Minera Y Energetica Sociedad Del Estado (CAMYEN) from the CATAMARCA Province of Argentina and Khanij Bidesh India Ltd. (KABIL) to build a future partnership with the aim of jointly developing, building, commercializing and operating projects of high technological content in the field of energy, mining and natural resources exploitation in the territory

of the province of CATAMARCA, the country and the world.

1.10.27 GSI has signed an MoU with Satluj Jal Vidyut Nigam Limited (SJVN), a PSU of M/o Power on 16.6.2020 for providing construction stage geotechnical services for ARUN-3 Hydroelectric project in Nepal. SJVN is a joint venture of the Government of India and the Government of Himachal Pradesh. The project will produce 3924 million units of electricity a year out of which 3065 million units will be transmitted to India for next 25 years after commissioning of the project. The hydropower project is also expected to strengthen the bilateral ties between Nepal and India.

1.10.28 Numaligarh Refinery (NRL) signed an MoU with aluminium giant National Aluminium Company Limited (NALCO) on 24th September, 2020 for long term supply of Calcined Petroleum Coke (CPC) for a period of 5 years with an annual estimated sale of 40,000 MT (+/-10%). MoU will be a win-win situation for both organizations with NRL gaining a dedicated market while NALCO ensuring raw material security for itself.

1.10.29 A total of 8112 Students / Research Scholars, Professors/Assistant Professors, 4959 officers from GSI, and 483 participants from DGMs and other organizations attended the e-training conducted by GSI Training Institute and Regional Training Divisions in the year 2020-21 till December, 2020.

1.10.30 04 online Training programmes (in house) conducted through VC-NIC wherein a total 161 IBM officials participated during the year 2020-21 up to December, 2020.

1.10.31 800 mining lessees filed online templates till December, 2020 on Sustainable Development Framework (SDF) web portal

Annual Report 2020-21

1.10.32 437 inspections have been undertaken by the IBM during the year 2020-21 up to December 2020. Further, 35 Ore dressing investigations have been undertaken by the IBM during the year 2020-21 up to December 2020. Also, 53 mining plans, 160 review of mining plans & 08 final mine closure

respectively. Validation is in progress.

under provisions of rule 35 of Mineral Conservation and Development Rules, 2017 with reference to the performance year 2019-20. As per system assigned provisional rating, 194 mines are falling under 5 Star category, 287 mines are falling under 4 Star category and 192 mines are falling under 3 Star category

Ministry of Mines

plans have been disposed of by IBM during the year 2020-21 up to December, 2020.

1.10.33 Patent has been granted to Jawaharlal Nehru Aluminium Research Development & Design Centre, (JNARDDC), Nagpur for "Development of process for selective in-situ dissolution of alumina & silica bearing mineral phases in bauxite at room temperature for geo-analytical application". The process can be used for rapid determination of the mineral constituents at remote mining sites for guick assessment of bauxite and laterite samples with minimum infrastructural support [Patent No. 340231 dated 02.07.2020].



Mahagiri Chromite UG Mine Loader Dumper Hauler

2

<u>Minerals</u> <u>and</u> <u>Metals in</u> <u>the</u> <u>Country</u>

Annual Report 2020-21

Minerals and Metals in the Country

Ministry of Mines

Minerals and Metals in the Country

•	National Mineral Scenario	Page - 15
•	Index of Mineral Production	Page - 15
•	Mining	Page - 17
•	Self-reliance in Minerals and Mineral Based Products	Page - 20
•	Production trends	Page - 21
•	State-wise Mineral Scenario	Page - 22

National Mineral Scenario

2.1 Minerals are valuable natural resources. They constitute the vital raw materials for many basic industries and are a major resource for development. The history of mineral extraction in India dates back to the days of the Harappan civilization. The wide availability of the minerals provides a base for the growth and development of the mining sector in India.

2.2 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 and other materials).

Index of Mineral Production

2.3 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 2020-21 (upto November)

is estimated to be 89.2 as compared to 101.9 for the same duration for the year 2019-20 showing a negative growth of 12.5% due to COVID-19 pandemic. The index of mineral production (base 2011-12=100) for the year 2019-20 was 109.6. The trend of index of mineral production and trend in value of mineral export and import 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**

2.4 The total value of mineral production (excluding atomic & fuel minerals) during 2020-21 has been estimated at Rs.1,29,950 crores, which shows a decrease of about 11.35% over that of the previous year which is due to COVID-19 pandemic and countrywide lockdown. During 2020-21, estimated value for metallic minerals is Rs.49,285 crores or 37.93% of the total value and nonmetallic minerals including minor minerals is Rs.80,664 crores or 62.07% of the total value. Information on production and value of minerals from 2016-17 to 2020-21 is given in Annexure 2.1. The details of export and import of Minerals during the period 2015-16 to 2019-20 is given in Annexure 2.2 and Annexure 2.3 respectively.







Figure 2.2: Trends in Value of Mineral Exports & Imports



Figure 2.3: Value of Minerals Production (by groups) (excluding atomic & fuel minerals)

Source: Monthly statistics on mineral production of IBM.

Price Trend

2.5 The WPI for minerals (base 2011-12=100) stood at 167.6 in October 2020 and the corresponding index was 153.6 for October 2019.

2.6 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 sillimanite. The wholesale price index for metallic minerals was 162.6 in October 2020 as compared to 147.3 in October 2019 and that of other minerals was 185.1 in October 2020 as compared to 176.0 in October 2019.

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 1303 in 2019-20 as against 1427 in the previous year.

2.8 Out of 1303 reporting mines, most of the mines reported are in Madhya Pradesh followed by Gujarat, Karnataka, Odisha, Andhra Pradesh, Chhattisgarh, Tamil Nadu, Rajasthan, Maharashtra, Jharkhand, Telangana and Goa.

2.9 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	2018-19 (P)	2019-20 (P)	2020-21 (E)
All Minerals*	1427	1303	1229
Metallic Minerals	610	566	545
Non-Metallic Minerals	817	737	684

*excluding atomic, fuel and minor minerals

Table 2.2 Area Wise Distribution of Mining Leases (Other than Atomic, Hydro Carbons Energy & Minor Minerals) as on 31/03/2019 (P) (All India)

Frequency (Hect.)	No. of Leases	Lease area (Hect.)
0 to 2	420	544.59
> 2 to 5	922	3575.23
> 5 to 10	417	3075.58
> 10 to 20	408	6026.73
> 20 to 50	477	15491.36
> 50 to 100	283	20189.44
> 100 to 200	208	30122.73
> 200 to 500	214	70970.65
Above 500	178	165989.72
Total	3527	315986.03

Sources: Respective State Governments (DGMs/DMGs etc); However, the data received from respective regional offices of IBM have also been taken in account wherever necessary. (P): Provisional

2.10 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 2018-19 (P) @ (By Principal Minerals)

Minerals	'A' Category	'B' Category	Total
Apatite	-	-	-
Chromite	6	-	6
Copper ore	5	-	5
Gold	5	-	5
Lead & Zinc	8	-	8
Manganese ore	9	6	15
Rock Salt	0	1	1
Total	33	7	40

@ excluding fuel, atomic & minor minerals;

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

'B' Category: Other than 'A' category

2.11 During 2020-21, mineral production was reported from 32 States / Union Territories (actual reporting of minerals for all 32 States/ Union Territories) (including MCDR minerals and estimation of minor minerals) of which the bulk of value of mineral production (excluding fuel and atomic minerals) of about 87.40% was confined to 10 States. Rajasthan is in leading position, in terms of estimated value of mineral production in the country and had the share of 17.14% in the national output. Next in order was Odisha with a share of 13.72% followed by Andhra Pradesh (13.32%), Telangana (8.42%), Chhattisgarh (7.84%), Karnataka (6.94%),Madhya Pradesh (6.16%), Gujarat (5.48%), Uttar Pradesh (4.26%) and Maharashtra (4.13%) in the total value of mineral production. The contribution of States/ UTs in the value of mineral production during 2020-21 estimated is pictorially shown in Figure 2.4.



Figure 2.4: Share of States in Value of Mineral Production 2020-21 (Estimated) (Excluding Atomic & Fuel Minerals)

Source: Statutory returns submitted to IBM

2.12 State-wise analysis revealed that during 2020-21, the value of mineral production (excluding fuel & atomic minerals) has shown a

Ministry of Mines

mixed trend as compared to that in the previous year. The States which have indicated major increase in the value of mineral production are Jammu & Kashmir (6.30%), Meghalaya (6.27%), Karnataka (2.53%), Rajasthan (0.50%), etc. However, some of the principal mineral producing states recorded decrease in value of mineral production (excluding fuel & atomic minerals) and those include Odisha (44.23%), Jharkhand (15.21%), Chhattisgarh (13.03%), etc.

2.13 All India Reserves and Resources of various minerals as on 01.04.2015, as per parameters of UNFC System are given in **Annexure 2.4**.

2.14 During 2019-20 (excluding atomic, fuel, and minor minerals), the Private Sector emerged to play a dominant role in mineral production accounting for 72.28% or Rs.54,187 crores 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 2019-20 were Copper ore and concentrate, Diamond, Fluorite (graded), Selenite, Rock Salt and Sulphur.

2.15 India's ranking in 2018 in world production was 2nd in Steel (crude/liquid), 3rd in Zinc slabs, 4th in aluminium, Chromite, iron ore, and lead (refined); 5th in Bauxite, 7th in Manganese ore, 11th in copper (refined), 15th in Magnesite and 16th in apatite & rock phosphate. 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, 2018

Contor	Unit of	Production (quantity)		Contribution	India's rank in	
Sector	Commodity	World	India*	(Percentage)	World order \$	
Metallic Minerals						
Bauxite	'000 tonnes	326000	23688	7.27	5 th	
Chromite	'000 tonnes	40800	3971	9.73	4 th	
Iron ore	million tonnes	2923	206	7.05	4 th	
Manganese ore	'000 tonnes	53000	2820	5.32	7 th	
Industrial Minerals						
Magnesite	'000 tonnes	29500	147	0.50	15 th	
Apatite & rock phosphate	'000 tonnes	232000	1285	0.55	16 th	
Metals						
Aluminium (Primary)	'000 tonnes	62700	3696	5.89	4 th	
Copper (refined)	'000 tonnes	23900	454	1.90	11 th	
Steel (crude/liquid)	million tonnes	1812	110.92	6.12	2 rd	
Lead (refined)	'000 tonnes	12000 ##	620 #	5.17	4 th	
Zinc (slab)	'000 tonnes	13300	696	5.23	3 rd	

Source: World mineral production data compiled from World Mineral Production, 2014-2018; British Geological Survey.

* Figures relate to 2018-19.

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

** As per Government of India Notification S.O. 423(E) dated 10th February, 2015, following minerals have been declared as minor minerals: i) barytes ii) dolomite iii) felspar iv) fireclay v) quartz/silica sand and vi) talc/steatite/soapstone & pyrophyllite, hence not included in the table due to non-availability of production data with respect to India.

\$: India's rank based on production mentioned in World Mineral Production 2014-18; British Geological Survey.

#: Figures as published in World Mineral Production, 2014-18. However, the production of Lead (Primary) during 2018-19 was 198 thousand tonnes.

##: Figure relates to both primary and secondary refined lead and include the lead content of antimonial lead.

Self-reliance in Minerals & Mineral Based Products

2.16 India continued to be wholly or largely self-sufficient in minerals which constitute primary mineral raw materials that are supplied to industries, such as, iron & steel, aluminium, cement, various types of refractories, china clay-based ceramics, glass, etc. India is self-sufficient or near to self-sufficient in bauxite, chromite, limestone, iron ore and sillimanite. India is deficient in kyanite, magnesite, rock phosphate, manganese ore, etc. which were

imported to meet the demand for either blending with locally available mineral raw materials and/or for manufacturing special qualities of mineral-based products. To meet the increasing demand of uncut diamonds, emerald and other precious & semi-precious stones by the domestic Cutting and Polishing Industry, India is dependent on imports of raw uncut stones for their value-added re-exports. Degree of Self-sufficiency in Principal Minerals & Metals, 2018-19 (P) is furnished in **Table 2.5**.

	lable 2.5		
Degree of Self-sufficiency in	Principal Minerals	& Metals, 2018-1	9 (P)
	Dama and /Dama atta	Community (Damage et a	Ouden

SI. No.	Commodity	Demand/Domestic Consumption ('000 tonnes)	Supply/Domestic supply ('000 tonnes)	Order of self- sufficiency (%)
Mine	erals			
1	Bauxite	22189	23688	100
2	Chromite	1920	3971	100
3	Iron ore	159940	206446	100
4	Kyanite	5.1	4.89	96
5	Limestone	350878	3790451/	100
6	Magnesite	195	147	75
7	Manganese ore*	5548	2820	51
8	Rock phosphate (including apatite)*	8802	1285	15
9	Sillimanite	56	69	100
Metals*				
10	Aluminium (primary)	3676	3696	100
11	Copper (refined)	1159 ^{2/}	454	39
12	Lead (primary)	381 <u>³/</u>	198	52
13	Zinc	7784/	696	89

Source: MCDR Returns for production data.

*: Apparent demand (production+ import-export)

Note: As per Government of India Notification S.O. 423(E) dated 10th February, 2015, the following minerals have been declared as minor minerals: i) barytes ii) dolomite iii) felspar iv) fireclay v) quartz/silica sand vi) talc/steatite/soapstone & vii) pyrophyllite, these have not been included in the table due to non-availability of production data for the year 2018-19⁻

Even in cases where almost entire domestic demand is satisfied by domestic supplies, some quantities of certain special quality/ types of minerals and metals/ferroalloys 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 & 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

2.17 The value of metallic minerals in 2019-20 at Rs.66,084 crores increased by 3.19% over the previous year. Among the principal metallic minerals, iron ore contributed Rs.48,107 crores or 72.80%, zinc concentrate Rs.6,023 or 9.11%, chromite Rs.3,333 crores or 5.04%, manganese Rs.1,942 crore or 2.94%, lead concentrates Rs.1,807 crore or 2.73%, silver Rs.1,804 crore or 2.73%, while the remaining was contributed by bauxite, copper (concentrate), gold and tin concentrates.

2.18 The Production of Bauxite at 21,824 thousand tonne during 2019-20 registered a decrease of 7.87% as compared to the previous year. Odisha with 70.95% contribution was the leading producer of bauxite followed by Gujarat (9.50%), Chhattisgarh (7.18%), Jharkhand (6.50%), Madhya Pradesh (3.14%), and Maharashtra (2.73%). The share of public sector in the total production was 49.76% while remaining 50.24% was contributed by private sector. There were 139 reporting mines of Bauxite.

2.19 The production of chromite at 3,929 thousand tonnes in 2019-20 decreased by 1.04% as compared to that in the previous year. Odisha reported almost entire production of chromite.

2.20 The production of copper ore in 2019-20 at 3,952 thousand tonnes decreased by 4.41% as compared to that in the previous year. There were five reporting mines of copper ore in 2019-20. The production of copper concentrates at 125 thousand tonnes decreased by 19.78% in 2019-20 as compared to that in the previous year.

2.21 The production of gold ore at 591 thousand tonnes in the year 2019-20 increased by 4.52% as compared to that in the previous year. Almost entire production of gold ore and bullion was reported from Karnataka.

2.22 The production of iron ore consisting of Lumps, Fines and Concentrates at 246 million tonnes in 2019-20 increased by almost 19.19% as compared to 206 million tonnes in the previous year. There were 250 reporting mines in 2019-20 as against 254 mines in the previous year. Odisha was the leading producer of iron ore accounting for 59.64% of total production followed by Chhattisgarh (14.11%), Karnataka (12.76%), Jharkhand (10.93%) and remaining (2.56%) production was reported from Andhra Pradesh, Madhya Pradesh, Maharashtra and Rajasthan.

2.23 The production of lead & zinc ores at 14.48 million tonne in 2019-20 increased by 5.28% as compared to that in the previous year. There were ten mines reporting production of lead and zinc ore in the current year. The production of lead concentrate decreased by 1.98% and the production of zinc concentrate decreased by 0.71% during the year. Rajasthan was the sole producing State of lead and zinc ores and concentrates.

2.24 The production of manganese ore at 2,904 thousand tonnes in 2019-20 has increased by 2.98% as compared to the previous year. There were 131 reporting mines of manganese ore in 2019-20. Madhya Pradesh continued to be the largest producer of Manganese Ore contributing 32.99% in the total output of the country.

Non-Metallic Minerals

2.25 The value of production of non-metallic minerals at Rs.8,882 crores during 2019-

20 decreased by 3.62% as compared to the previous year. Limestone retained its leading position by contributing Rs.8,312crores or 93.59% of the total value of non-metallic minerals in 2019-20. The other non-metallic minerals in the order of importance were phosphorite/rock phosphate (4.86%), and diamond (0.45%).

2.26 The production of limestone at 359 million tonnes during 2019-20 decreased by 5.2% as compared to that in the previous year.

2.27 The production of magnesite at 98 thousand tonnes during 2019-20 decreased by 33.36% as compared to that in the previous year. Tamil Nadu contributed 47.37% of the total production during 2019-20. The remaining was reported from Uttarakhand and Karnataka.

2.28 The production of phosphorite at 1,400 thousand tonnes in 2019-20 has increased by

9% as compared to that in the previous year. Rajasthan contributed 92.86% and the rest was accrued from Madhya Pradesh.

Minor Minerals

2.29 The value of production of minor minerals was estimated at Rs.71,626crore in 2018-19. Andhra Pradesh with share of 23.5% in the value of minor minerals produced in the country occupied the top position. Telangana was at second place with a share of 15.0% in the value of minor minerals. Next in the order was Rajasthan 14.3%, Gujarat 9.4%, Madhya Pradesh 7.9%, Uttar Pradesh 7.8%, Maharashtra 6.4%, Bihar 6.0%, Kerala 5.4% and the contribution of remaining states and UTs was less than five percent each.

State-wise Mineral Scenario

2.30 Status of top mineral rich states of India is at **Annexure 2.5**.

3

Legislative Framework, Mineral Policy and Implementation

Annual Report 2020-21

23

Legislative Framework, Mineral Policy and Implementation

Legislative Framework, Mineral Policy and Implementation

•	National Mineral Policy, 2019	Page - 25
•	Measures taken to control illegal mining	Page – 26
•	Mining Surveillance System (MSS)	Page - 28
•	Mineral Concession System	Page - 29
•	Mineral Laws (Amendment) Act, 2020	Page - 30
•	Subordinate Legislation	Page - 31
•	Mineral Auctions	Page - 34
•	District Mineral Foundation (DMF) and Pradhan Mantri Khanij	
	Kshetra Kalyan Yojana (PMKKKY)	Page - 36
•	Revision Applications	Page - 36

24
National Mineral Policy, 2019

3.1 National Mineral Policy, 2019 has been approved by the Union Cabinet on 28th February, 2019.

3.2 National Mineral Policy, 2019 replaced the extant National Mineral Policy 2008 ("**NMP 2008**"). The impetus to review NMP 2008 came about 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 vs. Union of India & Others.

3.3 In compliance of the directions of the Apex Court, the Ministry of Mines constituted a Committee on 14.08.2017 under the chairmanship of Dr. K. Rajeswara Rao, the then Additional Secretary, Ministry of Mines to review NMP 2008 and the Committee submitted its Report to the Ministry of Mines.

3.4 The Ministry of Mines accepted the Committee's Report and invited the comments/ suggestions of the stakeholders, and finalized the National Mineral Policy, 2019 taking into account the comments / suggestions received from the stakeholders.

3.5 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.

3.6 Details

The National Mineral Policy, 2019 includes provisions which will give boost to mining sector such as:

• 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;
- transfer of mining leases and creation of dedicated mineral corridors to boost private sector mining areas;
- proposes to grant status of industry to mining activity to boost financing of mining for private sector and for acquisitions of mineral assets in other countries by private sector;
- proposes to auction mineral blocks with pre-embedded clearances to give fillip to auction process;
- proposes to make efforts to harmonize taxes, levies & royalty with world benchmarks to help private sector.

3.7 National Mineral Policy, 2019 focusses on Make in India initiative and gender sensitivity in terms of the vision. In so far as the regulation in minerals is concerned, the main focus of the policy is on ease of doing business by adopting e-Governance, IT enabled systems, awareness and information campaigns. 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 suggested. NMP 2019 aims to attract private investment through incentives while the efforts would be made to maintain a database of mineral resources and tenements under mining tenement system. The new policy focuses on use of coastal waterways and inland shipping for evacuation and transportation of minerals and encourages Legislative Framework, Mineral Policy and Implementation

dedicated mineral corridors to facilitate the transportation of minerals. The NMP 2019 reiterates the utilization of the district mineral fund for equitable development of project affected persons and areas. 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.

3.8 The NMP 2019 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.

3.9 Benefits

The NMP 2019 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

Measures taken to control illegal mining:

3.10 Illegal mining means any reconnaissance or prospecting or mining operation undertaken by any person or a company in any area without holding a reconnaissance permit or a prospecting license or, as the case may be, a mining lease as required under sub-section (1) of section 4 of the MMDR Act. Section 23C of Mines and Minerals (Development and Regulation) Act 1957, empowers the State Governments to frame rules to prevent illegal mining and the State Government may, by notification in the official gazette, make such rules for preventing illegal mining, transportation and storage of minerals and for the purposes connected therewith in the State.

3.11 There is a three-pronged strategy for prevention of illegal mining viz. constitution of task force by the State Governments at State and District Level, framing of rules under Section 23C of the MMDR Act, 1957 and furnishing of quarterly returns on illegal mining for review to the Central Government. The details of States who have constituted task force at State level, framed Rules under section 23C of the MMDR Act, 1957 and have furnished quarterly returns on illegal mining to IBM are as follows:

- **Constitution of State Level Task Force:** (i) 22 State Governments have constituted the task force namely, Andhra Pradesh, Bihar, Chhattisgarh, Assam, Goa, Gujarat, Haryana, Himachal Pradesh, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Mizoram, Nagaland, Odisha, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand and West Bengal. The function of the task force is to review the action taken by member departments for checking the illegal mining activities in their respective jurisdiction.
- (ii) Framing of Rules under section 23C of MMDR Act, 1957: 21 State Governments have framed the rules under section 23C of MMDR Act, 1957 to curb illegal mining namely, Andhra Pradesh, Bihar, Chhattisgarh, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Kerala, Telangana, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Uttarakhand & West Bengal.

(iii) Receipt of Quarterly returns on illegal mining: The State Government submits quarterly returns on prevention of illegal mining to IBM. These returns contain details such as number of cases detected and action taken there on etc. IBM on receipt of the returns from the various State Governments, consolidates the information and sends it to the Ministry at the end of each quarter.

3.12 The Mineral Conservation and Development Rules, 2017 (MCDR) provides measures to ensure systematic and scientific mining. Rule 45 of the MCDR provides for the mining companies to submit 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 State Government(s) and Indian Bureau of Mines.

3.13 Details of mines/traders registered with IBM as given in **Table 3.1**.

Details	Registers as on December,
	2020
Mining Leases*	6,368
End users	3,566
Traders	6,139
Stockists	1,833
Exporters	1.001

Table 3.1

*Mining leases including both working and non-working leases. IBM has recommended 103 cases for termination and 129 cases for suspension under Rule 45(7)(a)(i).

Note: IBM has also requested the State Governments not to issue transit passes for movement of minerals to unregistered operations.

3.14 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

3.15 Indian Bureau of Mines (**IBM**) has entered into a MoU with National Remote Sensing Centre (**NRSC**) for a pilot project "Sudoor Drishti" 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.

3.16 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. 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 software and hardware for the lab. Now the remote sensing labs have been established one at Nagpur and other at Hyderabad and are fully operational. Transfer of legacy data of Multi-Mineral Leasehold Map, which was earlier on AutoCAD system, is being carried out on GIS platform and all Reconnaissance Permit and Prospecting Licenses are being digitized on GIS platform along with Integration of regional geology, forest map and mine lease boundary maps.

3.17 An MoU has been signed between IBM & MOIL for pilot study of MOIL leases in

Maharashtra state using time series satellite imageries (for the year 2010, 2014 and 2018) procured from NRSC.

Mining Surveillance System

3.18 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 and Indian Bureau of Mines (IBM) have developed the MSS, with assistance from Bhaskaracharya Institute for space applications and Geoinformatics (BISAG), Gandhinagar and Ministry of Electronics and Information Technology.
- 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 and 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 launched on 24th January, 2017 at Gandhinagar for enabling public participation in assisting the Government's 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 cases of 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. Total 164 Officers from States participated in the training.
- In the second phase, 52 major mineral triggers have been detected from the 3280 plotted leases (out of 1694 working mines 1689 have been plotted and out of 2129 non-working mines 1596 have been plotted) across the country, out of which 45 have been verified by the State Governments and in 5 cases unauthorized mining activities have been identified.
- Similarly, in respect of minor minerals, 130 triggers have been generated so far, out of which 106 triggers have been verified and in 11 cases unauthorized mining activities have been identified.
- The work of third phase of MSS trigger generation for major mineral plotted leases is in progress at BISAG. About 960 high resolution satellite images (Cartosat-2E) have been acquired from NRSC having resolution of 60 cm. Earlier Cartosat-1 satellite images, which had resolution of 2.5 m were used. Hence, there is a considerable improvement in the system as high resolution of satellite images will be used for the 3rd phase trigger generations. Due to covid situation, the acquisition of satellite images is delayed

and 3rd phase of MSS trigger generation is likely to be completed in about 2 to 3 months.

Mineral Concession System

3.19 As per the Amendment to MMDR Act in 2015, the system of allocation of Mineral Concession has been changed from first come first serve basis to a transparent and non-discriminatory auction process. The Amendment also has brought in a uniform tenure of 50 years for Mining Leases.

Mines and Minerals (Development and Regulation) Act

3.20 Ministry of Mines is responsible for survey and exploration of all minerals, other than natural gases, petroleum and atomic minerals and for mining and metallurgy of metals like Iron, aluminium, copper, zinc, lead, gold, nickel etc. and also for administration of the Mines and Minerals (Development and Regulation) Act, 1957 in respect of all mines and minerals other than coal, natural gas and petroleum, but including offshore minerals. In performing its functions, the Ministry is assisted by Geological Survey of India and Indian Bureau of Mines.

The Mines and Minerals (Development and Regulation) Act, 1957 is available on web link–

https://www.indiacode.nic.in/ bitstream/123456789/1421/1/A1957-67. pdf



3.21 The details of amendments to the Mines and Minerals (Development and Regulation) **[MMDR]** Act, 1957 are as under:-

(i) The Mines and Minerals (Regulation and Development) Amendment Act, 1958 (15 of 1958) (w.e.f. 15.05.1958).

- (ii) The Repealing and Amending Act, 1960 (58 of 1960) (w.e.f. 26.12.1960).
- (iii) The Mines and Minerals (Regulation and Development) Amendment Act, 1972 (56 of 1972) (w.e.f. 12.09.1972).
- (iv) The Mines and Minerals (Regulation and Development) Amendment Act, 1986 (37 of 1986) (w.e.f. 10.02.1987).
- (v) The Mines and Minerals (Regulation and Development) Amendment Act, 1994 (25 of 1994) (w.e.f. 25.01.1994).
- (vi) The Mines and Minerals (Regulation and Development) Amendment Act, 1999 (38 of 1999) (w.e.f. 18.12.1999).
- (vii) The Mines and Minerals (Development and Regulation) Amendment Act, 2010 (34 of 2010).
- (viii) The Mines and Minerals (Development and Regulation) Amendment Act, 2015 (10 of 2015) (w.e.f. 12.01.2015).
- (ix) The Mines and Minerals (Development and Regulation) Amendment Act, 2016 (25 of 2016) (w.e.f. 06.05.2016).
- (x) The Mineral Laws (Amendment) Act, 2020 (2 of 2020) (w.e.f. 10.01.2020).

3.22 A major amendment was carried out in 2015 in the Act through the MMDR (Amendment) Act, 2015. The most important feature of the said amendment was the provision for grant of mineral concessions through auction as against the earlier method of 'first-come-first-served', in order to bring in greater transparency and remove discretion at all levels in grant of mineral concessions. The method of auction also ensures that the State Government get its fair share of revenue accruing from the auction process. Following are some other salient provisions and objectives

of the MMDR (Amendment) Act, 2015:

- (i) All mineral concessions are granted only through auction [Section 10 B & 11].
- (ii) Auction for mining leases (ML) for bulk minerals; auction of prospecting licencecum-mining leases (PL-cum-ML) for deep-seated minerals [Section 10 B & 11].
- (iii) To solve issues arising out of all Supreme Court judgments on second and subsequent renewals, the period of mining lease was made uniform as 50 years without any provision for renewals and making it mandatory for auction of the blocks at the end of the lease period. [Section 8 A (1), (2), (3) and (4)].
- (iv) Transition period of minimum 15 years for captive mines and 5 years for merchant mines were provided to ensure that there was no sudden stoppage of mineral production as a result of bringing auction methodology for allocation of mineral sources [Section 8A(5) and 8A(6)].
 Central Government was empowered to prescribe to issue binding directions to States for conservation and development of minerals and or on any policy matter of national interest [Section 20A].
- (v) Central Government to frame separate rules for atomic minerals [Amendment to Section 11B].
- (vi) The requirement of previous approval of the Central Government for grant of mineral concession other than for Atomic Minerals, Coal and Lignite was dispensed with [Amendment to Section 5(1)].
- (vii) Enabling powers for reservation of mineral bearing area for the public sector

continued with the condition to execute Mining lease by Government Companies for such reserved area.[Section 17A(2A)].

- (viii) Higher penalties and jail terms for offenses and provision for special courts for handling the offenses under the Act were added [Amendment to Section 21(1) & (2) and Section 30].
- (ix) Provision for establishing District Mineral Foundation to benefit people and areas affected by mining [Section 9B].
- (x) Provision for establishing National Mineral Exploration Trust for providing impetus to exploration [Section 9C].
- (xi) Easy transferability of concessions obtained through auctions to attract private investment and FDI [Section 12A].
- (xii) Powers to Central Government to intervene when the State Governments do not pass orders within prescribed time lines to eliminate delay [Amendment to Section 30].

3.23 After this amendment, the amendment to the Act was carried out in the year 2016 through the Mines and Minerals (Development and Regulation) Amendment Act, 2016 (25 of 2016) (w.e.f. 06.05.2016) to bring in clarity on the transfer of mining leases.

3.24 Mineral Laws (Amendment) Act, 2020

The Mines and Minerals (Development and Regulation) (MMDR) Act, 1957 was amended through the Minerals Laws (Amendment) Ordinance, 2020 on 10.01.2020, to facilitate seamless transfer of valid rights/ clearance to new lessees and to incentivize exploration of deep seated minerals, for maintaining the sustainable production in the country

considering the fact that a large number of working mining leases were expiring in March 2020 under some of the provisions of the MMDR Act which would have created a situation of shortage mineral availability in the country. The same is available at Ministry of Mines' website on web link –

https://mines.gov.in/writereaddata/ UploadFile/minerallawamendment 202013072020637147929474483458.pdf

The Ordinance was replaced by Mineral Laws (Amendment) Act, 2020 (No. 2 of 2020). notified on 13th March, 2020, which came in to effect from 10.1.2020. The same is available at Ministry of Mines' website on web link-

https://www.mines.gov.in/ writereaddata/UploadFile/Gazette%20 Notification18032020.pdf



In order to implement the amended provisions of the MMDR Act, the Mineral Auction (Amendment) Rules, 2020 and Minerals (Other than Atomic and Hydrocarbon Energy Minerals) Concession (Amendment) Rules, 2020 were notified on 20.03.2020, which is available at Ministry of Mines' website on web link -

https://mines.gov.in/writereaddata/ UploadFile/MCR2020MAR202016042020. pdf



These amendments were made to help in early operationalisation of the mineral blocks auctioned & also facilitate transfer of all the valid clearances of the old lessee to the successful bidder for a period of two years for mining leases expiring under the provisions of the Section 8A(5) and (6) of the Act. Further, MoEF&CC has also issued notification for Environment Clearance **(EC)** on 28.03.2020 and guidelines for Forest Clearance **(FC)** on 31.03.2020 in line with the Mineral (Auction) Amendment Rules, 2020.

3.25 Subordinate Legislation

The following rules have been framed and notified under the MMDR Act, 1957:

The Mineral Concession Rules, 1960 (framed under Section 13 of the MMDR Act). This rule shall apply to all minerals except minor minerals defined under clause (e) of section 3 and minerals listed in Part A and in respect of licensing relating to atomic minerals listed in Part B of the First Schedule of the Act. The said rule was further replaced by the Minerals (Other than Atomic and Hydro Carbon Energy Minerals) Concession Rules, 2016 [framed under section 13] after the amendment in the MMDR Act, in 2015 for regulating the grant of mineral concessions for major minerals and for purposes connected therewith. The rule was further amended on 20.03.2020 to implement the provisions of the Mineral Laws Amendment Act, 2020. The Minerals (Other than Atomic and Hydro Carbon Energy Minerals) Concession Rules, 2016 shall apply to all minerals except minor minerals and minerals listed in Part A (Coal & Lignite) & Part B (Atomic Minerals) of the First Schedule to the MMDR Act. The Minerals (Other than Atomic and Hydro Carbon Energy Minerals) Concession Rules, 2016 are available at Ministry of Mines' website on web link -

https://www.mines.gov.in/writereaddata/ UploadFile/MineralsConcession%20 Rules2016.pdf



 (i) The Minerals (Evidence of Mineral Contents) Rules, 2015 [framed under clause (a) of sub-section (2) of section 5] Rules for prescribing the parameters of existence of mineral contents, which are available at Ministry of Mines' website on web link -

https://www.mines.gov.in/ writereaddata/UploadFile/Minerals (EvidenceofContents)Rules,2015.pdf



The Mineral (Auction) Rules, 2015 to (ii) terms and conditions, and prescribe procedure for conducting auction of mineral blocks and subsequent grant of prospecting licence-cum-mining leases and mining leases. The rule was further amended on 30.11.2017 to amend the eligibility for participating in the auction and also to allow the auctioned captive mines to sell mineral to the tune of 25% of the production of previous financial year. The rule was again amended on 20.03.2020 to implement provisions of the Mineral Laws Amendment Act, 2020. The Mineral (Auction) Rules, 2015 are available at Ministry of Mines' website on web link -

> https://www.mines.gov.in/ writereaddata/UploadFile/Mineral %20(Auction)%20Rules,%202015.pdf

(iii) The Mineral (Non-exclusive Reconnaissance Permits) Rules, 2015 to prescribe the terms and conditions for grant of Non-Exclusive Reconnaissance Permit, which are available at Ministry of Mines' website on web link -

> https://www.mines.gov.in/ writereaddata/UploadFile/NERP%20 Rules,%202015.pdf



were amended in 2018 for incorporation of accounting procedure of NMET. The National Mineral Exploration Trust Rules, 2015 are available at Ministry of Mines' website on web link –

https://www.mines.gov.in/ writereaddata/UploadFile/NMETRules 2015.PDF

(v) The Mines and Minerals (Contribution to District Mineral Foundation) Rules, 2015 to prescribe the amount of payment to be made to the District Mineral Foundation. The rule was further amended on 31.08.2016 for prescribing the date from which contribution to be made under DMF. The Mines and Minerals (Contribution to District Mineral Foundation) Rules, 2015 are available at Ministry of Mines' website on web link -

> https://www.mines.gov.in/ writereaddata/UploadFile/DMF%20 rates%20notification.pdf



The Mineral (Mining by Government (vi) Company) Rules, 2015 to prescribe the period of mining leases, including existing mining leases, of Government companies or corporations and the payment to be made by Government company or corporation, or a joint venture, for mining lease to be granted under the reservation route. The Rules was further amended on 27.09.2019 to ensure the extension of leases in respect of PSUs by the State Government. The Mineral (Mining by Government Company) Rules, 2015 are available at Ministry of Mines' website on web link -

> https://www.mines.gov.in/ writereaddata/UploadFile/The%20 MineralMGCRules%202015.pdf



(vii) Minerals (Transfer of Mining Lease Granted Otherwise than through Auction for Captive Purpose) Rules, 2016 to prescribe the terms and conditions and the amount or transfer charges for affecting the transfer of a mining lease granted otherwise than through auction for captive purpose, which are available at Ministry of Mines' website on web link-

> https://www.mines.gov.in/ writereaddata/UploadFile/ MineralsTransferRules2016.pdf



(viii) The Atomic Mineral Concession Rules, 2016 for regulating the grant of mining leases or other mineral concessions in respect of minerals specified in Part B of the First Schedule and for purposes connected therewith. Further, rule was also amended on 19.02.2019 & 20.02.2019 to amend Schedule A and prescribing the threshold value in all cases of Beach Sand Minerals and other placer deposits. The Atomic Mineral Concession Rules, 2016 are available at Ministry of Mines' website on web link -

> https://www.mines.gov.in/ writereaddata/UploadFile/AMC Rules%202016.pdf



Mineral Conservation and Development (ix) Rules, 2017 for the conservation and systematic development of minerals in India and for the protection of environment by preventing or controlling any pollution which may be caused by prospecting or minina operations. Further, Rules were amended on 27.03.2018 for relaxing the norms to carry out General Exploration (G2) over the entire mineralized area for the leases

expired on 31.03.2020 as per Section 8A(6) of the MMDR Act. The Mineral Conservation and Development Rules, 2017 are available at Ministry of Mines' website on web link -

https://www.mines.gov.in/ writereaddata/UploadFile/MCD Rules%202017.pdf



(x) Granite Conservation and Development Rules, 1999 for conservation and systematic development of and scientific mining to conserve the granite resources and to prescribe a uniform framework with regard to systematic and scientific exploitation of granite throughout the country, which are available at Ministry of Mines' website on web link -

> https://www.mines.gov.in/ writereaddata/UploadFile/GCDR%20 Rules1999.pdf



The (xi) Marble Development and Conservation Rules, 2002 for conservation and systematic development of and scientific mining to conserve the marble resources and to prescribe a uniform framework with regard to systematic and scientific exploitation of marble throughout the country, which are available at Ministry of Mines' website on web link -

> https://www.mines.gov.in/ writereaddata/UploadFile/MDC Rules%202002.pdf



3.26 The Ministry of Mines also issued order under section 20A of the MMDR Act for preembedded clearances for green field mining projects, i.e., for those mines which are ready for auction to promote ease of doing business on 03.06.2020. The States have been advised to establish Project Monitoring Unit (PMU) and obtain all the clearances from different agencies which will later be transferred to the successful bidder. This would work as a major reform in mining sector as all clearances required for starting the production from mine will be obtained before auction itself. This would also help to attract more players in the field of mining.

3.27 The Ministry of Mines further issued two orders under section 20A of the MMDR Act on 03.12.2020 permitting Steel Authority of India to sell its 25% production of iron ore in the open market and also to sell the sub-grade mineral lying on mine pit head of SAIL which could not be used by the captive Plants of SAIL, to maintain the availability of iron ore in the market considering the fact that 46 mines were expired due to statutory provisions of the MMDR Act which resulted in shortage of supply of iron ore in the market.

Mineral Auctions

3.28 Auction Framework and Handholding Support

- (i) The Government of India amended the Mines and Minerals (Development and Regulation) (MMDR) Act, the principal act which governs the mineral sector in India, with effect from 12th January, 2015, which brought major paradigm shift in the mining regulations, including the grant of mineral concessions of major minerals through auctions to bring transparency and remove discretion.
- (ii) 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 document to facilitate the State Governments to expedite the auction process.

In order to provide handholding support (iii) 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.

3.29 Auction Status

- (i) The MMDR Amendment Act, 2015 instituted the system of e-auction for grant of mineral concessions for major minerals with a view to bring in greater transparency and removal of discretion in allotment. 105 mineral blocks across 9 States, namely Rajasthan, Odisha, Madhya Pradesh, Chhattisgarh, Karnataka, Jharkhand, Andhra Pradesh, Gujarat and Maharashtra have been successfully auctioned till 31.12.2020.
- (ii) The estimated value of resources in the 105 successfully e-auctioned mineral blocks across the country is over Rs. 8,06,631crore. The total estimated revenue to the State Governments over the lease period of these mines stands at Rs.8,27,982 crores. The estimated additional contribution to the State Governments by way of auction premium

is Rs. 6,93,615 crore over the lease period. Out of the cumulative statutory payments of Rs. 1,34,367 crores, the Royalty, the District Mineral Fund (DMF) and National Mineral Exploration Trust (NMET) contributions work out to be Rs. 1,19,971 crores, Rs. 11,997 crore and Rs. 2,399 crores respectively. The year wise auction summary as on 31st December, 2020 is given in **Table 3.2**.

Year	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21 (as on 31.12.2020)	Total
Number of blocks auctioned	6	15	14	19	43	8	105
Mineral	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	 17 Iron Ore, 6 Iron Ore & Manganese, 5 Bauxite, 4 Limestone, 3 Chromite, 3 Manganese, 2 Copper, 2 Graphite, 1 Diamond 	4 Limestone, 2 Gold, 1 Bauxite, 1 Iron Ore	 37 Iron Ore, 30 Limestone, 6 Iron Ore & Manganese, 7 Bauxite, 5 Graphite, 5 Manganese, 6 Gold, 3 Chromite, 2 Copper, 2 Diamond
Estimated value of the resources (in crore)	29,817.72	63,372.55	90,136.20	42,671.50	576,129.07	4,504.32	806,631.36
Additional Contribution through Auction (in crore)	13,032.23	44,501.74	53,850.14	32,004.51	548,816.55	1,409.60	693,614.77
Royalty (in crore)	4,565.44	9,564.42	14,895.90	6,703.21	83,358.16	883.72	119,970.85
DMF (in crore)	456.54	956.44	1,489.59	670.32	8,335.82	88.37	11,997.08
NMET (in crore)	91.31	191.29	297.92	134.06	1,667.16	17.67	2,399.42
Total of Royalty + DMF + NMET (Statutory Payments) (in crore)	5,113.30	10,712.15	16,683.41	7,507.60	93,361.14	989.76	134,367.35
Total revenue to the Govt. over 50 years (in crore)	18,145.53	55,213.88	70,533.55	39,512.11	642,177.69	2,399.36	827,982.11

Table 3.2Year-wise Auction Summary as on 31st December, 2020

Legislative Framework, Mineral Policy and Implementation

Ministry of Mines

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

- DMF is meant to address the longstanding 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. 12th January, 2015.
- 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 16th September, 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 other priority 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.
- Rs. 44008.51Crores have been collected as on 31st December, 2020.
- Total 1,93,753 projects under different sectors have been sanctioned, out of this 69% projects are being done in high priority sectors like drinking water, sanitation, health care etc.

- Funds worth more than Rs.41095.95crore have been sanctioned for various projects.
- A national level portal http:// mitra.ibm.gov.in/pmkkky has been launched where up to date information regarding fund collection and utilization is being displayed.
- District wise breakup of funds is displayed.
- Data for fund collection and utilization will be fed directly from the districts on the national level portal.
- Project details with respect to the high priority and other priority sectors as specified in the PMKKKY guidelines will be entered by the District Mineral Foundations.
- The dashboard displaying the fund and project information is available to the public for view.

Revision Applications

3.31 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 Government or any other authority. Under Rule 35 and 36 of MCR 2016 detailed procedure for filing and disposal of Revision Application has been prescribed.

3.32 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. The Web Link of Status of Revision Application is www.ras.
- (ii) Final Orders are available on the website; The Web Link of Status of Revision Application is www.ras.nic.in/ WebQuery.aspx

- (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.

3.33 As far as possible, cases are being heard on a chronological order and their age of pendency.

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

3.35 During 1st January, 2020 to 31st December, 2020, 50 Revision Applications were disposed of by Revisionary Authorities in the Ministry of Mines.

Legislative Framework, Mineral Policy and Implementation

Ministry of Mines



Joda East Iron Mine Haul Road Sprinklings

Annual Report 2020-21

Revenue from Mineral Resources

Annual Report 2020-21

Revenue from Mineral Resources

Ministry of Mines

Revenue from Mineral Resources

•	Royalty - Legal provisions	Page -	41
•	Revision of rates of royalty and dead rent in respect of major minerals (non-coal minerals)	. Page -	41
•	Rates of royalty	Page -	42

Annual Report 2020-21

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 (noncoal 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 the same 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 notified the same 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) by the various State Governments for the year 2016-17, 2017-18, 2018-19 and 2019-20(P) are given at Table 4.1.

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

Table 4.1 State wise Royalty Accrual of Major Minerals (Other than Coal, Lignite, Sand for Stowing and Minor Minerals) from 2016-17 to 2019-20(P)

(Unit:	Lakhs	Rupees)
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				• •
State	2016-17	2017-18	2018-19 (R)	2019-20 (P)
Andhra Pradesh	33647	33492	41797	NA
Assam	528	464	503	710
Bihar	152	153	589	NA
Chhattisgarh	111533	165130	221167	218472
Goa	31475	23961	2231	510
Gujarat	27044	26366	27041	21832
Himachal Pradesh	7082	13175	NA	NA

State	2016-17	2017-18	2018-19 (R)	2019-20 (P)
J & K	946	1544	928	NA
Jharkhand	69037	125559	NA	NA
Karnataka	103433	127140	128324	142483
Kerala	645	851	535	NA
Madhya Pradesh	37792	46166	53880	NA
Maharashtra	14562	17146	19598	18273
Meghalaya	4470	5592	8639	NA
Odisha	249634	347041	758117	784351
Rajasthan	236612	264897	290859	NA
Telangana	20126	22927	23578	20743
Tamil Nadu	20210	15067	NA	NA
Uttarakhand	32	26	40	NA
Uttar Pradesh	628	1919	NA	NA

Source: Data received from concerned state Government/DGM offices

P: Provisional; R: Revised;

NA: Not Available (Data not received from concerned State Government

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	(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.	
		(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.	
2.	Chromite	Fifte	en per cent of average sale price on ad valorem basis.	
3.	Copper	Four meta prod	point six two per cent of London Metal Exchange Copper al price chargeable on the contained copper metal in ore uced.	

4.	Diamond		Eleven point five per cent of average sale price on ad valorem basis.
5.	Dolo	mite	Seventy five rupees per tonne.
6.	Gold	l:	
	(a)	Primary	Four per cent of London Bullion Market Association Price (commonly referred to as "London Price") chargeable on the contained gold metal in ore produced.
	(b)	By-product gold	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.
7.	Grap	ohite :	
	(i)	with 80 per cent or more fixed carbon.	Two hundred and twenty five rupees per tonne.
	(ii)	with 40 per cent or more fixed carbon but less than 80 percent fixed carbon.	One hundred and fifty rupees per tonne.
	(iii)	with 20 per cent or more fixed carbon but less than 40 percent fixed carbon	Sixty five rupees per tonne.
	(iv)	With less than 20 percent fixed carbon.	Iwenty five rupees per tonne.
8.	lron conc	ore: (lumps, fines & entrates all grades)	Fifteen per cent of average sale price on ad valorem basis.
9.	Lead		(a) Eight point five per cent of London Metal Exchange lead metal price chargeable on the contained lead metal in ore produced.
			(b) Fourteen point five per cent of London Metal Exchange lead metal price chargeable on the contained lead metal in the concentrate produced.
10.	Lime	estone :	
	(a)	L.D. grade (less than one and half per cent silica	Ninety rupees per tonne.
	<i>(</i> L.)	Content)	Eighty rupees per tonne.
11		ouners	Three per cent of sale price on advalerem basis
12	Mag		
12.	ivian		Five new cent of everyon color price are adveloped back
	(a)	Ore of all grades	Five per cent of average sale price on ad valorem basis.
	(b)	Concentrates	One point seven per cent of average sale price on ad valorem basis.

13.	Silver	
	(a) By-product	Seven per cent of London Metal Exchange Price chargeable on by-product silver metal actually produced.
	(b) Primary silver	Five per cent of London Metal Exchange silver metal price chargeable on the contained silver metal in ore produced.
14.	Zinc	(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.
		(b)Ten per cent of London Metal Exchange zinc metal price on ad valorem basis chargeable on contained zinc metal in concentrate produced.
15.	All other minerals not here- in-before specified [Agate, Corundum, Diaspore, Felsite, Fuchsite-Quartzite, Kyanite, Jasper, Perlite, Rock Salt, Selenite, Pyroxenite, etc.]	Twelve per cent of average sale price on ad valorem basis.

Notes:

* Rates of royalty in respect of item No.10 relating to Coal (including Lignite) as revised vide notification number G.S.R. 349 (E), dated the 10th May, 2012, read with corrigendum G.S.R. 525(E), dated the 14th June, 2012 of the Government of India in the Ministry of Coal shall remain in force until revised through a separate notification by the Ministry of Coal.

** Rates of Royalty in respect of item 41 relating to Sand for Stowing revised vide notification number G.S.R. 214(E) dated the 11th April, 1997 will remain in force until revised through a separate notification by the Department of Coal.



International Cooperation

Annual Report 2020-21

International Cooperation

•	Objectives	Page- 47
•	Memorandums of Understanding (MoUs) signed during the period	Page - 47
•	Bilateral Meetings	Page- 48
•	Khanij Bidesh India Ltd. (KABIL)	Page - 50

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, 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 Cooperation Division has been engaging in collaboration with countries like Australia, Russia, African and Latin American countries. A number of Memorandums of Understanding (MoU) have also been signed with mineral rich countries. India used to participate in various International Mining events by setting up India Pavilion, 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.

5.2 Due to COVID-19 pandemic outbreak, the Ministry of Mines could not participate in any of the International Mining events during this year. However, despite the corona virus threat and worldwide lockdown, the Ministry of Mines' commitment to mineral development has led to opt rather unconventional methods of engagement through video conferencing, online seminars and training etc. This allowed the Ministry to be progressive and pioneering even in the most adverse situations faced by the whole world during this year.

Memorandum of Understanding (MoU) signed during the period

5.3 In the interest of developing bilateral

cooperation with countries having rich mineral resources and access to the latest technologies in the exploration and development of minerals, the Central Government has entered into bilateral agreements with the Governments of a number of countries viz. Afghanistan, Australia, Bangladesh, Bolivia, Brazil, Chile, China, Colombia, Finland, Morocco, Malawi, Mali, Mozambique, Peru, United Kingdom, Zambia and Zimbabwe. Moreover, the Ministry of Mines is constantly endeavouring to seek greater engagements overseas in order to ensure mineral security for the Country.

MoU with Australia

5.4 An MoU was signed between the Ministry of Mines and Department of Industry, Science, Energy and Resources for Australia on cooperation in the field of mining and processing of critical and strategic minerals for an initial period of five years and exchanged during the India-Australia Leaders' Virtual Summit between Hon'ble Prime Minister of India and Hon'ble Prime Minister of Australia through video conference held on 04th June, 2020.

5.5 India's Make in India initiative is aiming to make India a global manufacturing hub for twenty-five different sectors including electric vehicles, electrical machinery, electronic systems and renewable energy technologies, for which critical and strategic minerals are essential. For this, the critical and strategic minerals having significant importance, including lithium, cobalt and others rare earth elements, are identified which are also susceptible to disruptions in supply as India is deficient in these minerals.

MoU with Finland

5.6 An MoU was signed on 3rd December, 2020 between Geological Survey of India, Ministry of Mines and Geological Survey of Finland (Geologian Tutkimuskeskus), Ministry of Employment and the Economy, Government of Finland, for cooperation in the fields of Geology and Mineral Resources, as Finnish side has expertise in multi-thematic data integration and analysis using spatial platform with special emphasis on 3/4D modelling for mineral prognostication, hazard management,



environmental impact assessment, and any other areas of socio-economic significance, and developing Decision Support System (DSS), which can be used with minimal knowledge of GIS based modelling.

MoU with Argentina

5.7 An MoU between Ministry of Mines and the Secretariat of Mining of the Ministry of Productive Development of the Argentine Republic on cooperation in the field of Mineral Resources is under consideration, which is likely to be signed by March, 2021.

Bilateral Meetings

5.8 There are a number of bilateral meetings held during the year 2020-21 with various countries to further the cooperation and collaboration in the fields of Mining, Geology and Mineral Resources, including the critical and strategic minerals.



5.9 A meeting between Hon'ble Minister of Coal, Mines and Parliamentary Affairs, Government of India Shri Pralhad Joshi and Hon'ble Australia's Minister for Resources, Water and Northern Australia, Government of Australia Mr. Keith Pitt MP was held through video conferencing on 11.09.2020.

5.10 First meeting of Joint Working Group (**JWG**) under the MoU between the Ministry of Mines and the Ministry of Mines & Minerals Development, the Government of Zambia on cooperation in the fields of Geology and Mineral Resources was held through video conferencing on 23.09.2020.



5.11 First meeting of Joint Working Group (JWG) under MoU on cooperation in the field of mining and processing of Critical and Strategic Minerals between India and Australia was held on 26.11.2020 through video conference. During this meeting, various areas w.r.t. cooperation in the fields of critical and strategic minerals were deliberated, which may go long way to benefit India' resource security agenda through route of direct investments in Australia or as collaborations for knowledge and technology transfers.



5.12 An MoU between the Geological Survey of India (GSI), Ministry of Mines and the Geological Survey of Brazil –CPRM (GSB–CPRM), Ministry of Mines and Energy of the Federative Republic of Brazil for cooperation in field of Geology and Mineral Resources was signed on 25.01.2021. First meeting of the Joint Working Group under the MoU was held on 12.11.2020 through video conferencing.

5.13 A meeting was taken by Shri Pralhad Joshi, Hon'ble Minister of Coal, Mines and Parliamentary Affairs with Sh. Dinesh Bhatia, Ambassador of India to Argentina on 9thDecember, 2020 regarding cooperation on Lithium with Argentina.

Khanij Bidesh India Ltd. (KABIL)

5.14 With the advent of current economic developments of the country, assured supply of critical and strategic minerals is vital for the defence and security of India as well as its transition to a more advanced low fossil fuel based industrial economy. In this regard, import dependency for strategic minerals is one of the most obvious challenges.

5.15 A joint venture company named 'Khanij Bidesh India Ltd. (KABIL) was formed during the year 2019 by NALCO, HCL and MECL with equity participation of 40:30:30 respectively. KABIL is mandated to identify, explore, acquire, develop, mine, process and sale overseas mineral assets for 12 critical & strategic minerals viz. Lithium (Li), Cobalt (Co), Germanium (Ge), Indium (In), Beryllium (Be), Niobium (Nb), Selenium (Se), Gallium (Ga), Tantalum (Ta), Tungsten (W), Bismuth(BI)

and Tin (Sn). The main objective is to ensure mineral security of the nation through supply side assurance of these minerals.

5.16 KABIL is pursuing engagements with select source countries such as Argentina, Bolivia and Chile, Australia, Russia, Canada and USA with a focus on Lithium which are endowed with the cited critical & strategic minerals. The primary interface in each country has been the respective federal agencies and engagement with central and state-owned public enterprises through the Embassies & Missions of India. So far, KABIL has signed non-binding MoUs with Non-Disclosure Agreement for information sharing with the following state-owned organisations:

- M/s. JEMSE, a state-owned enterprise of JUJUY province of Argentina
- M/s. YPF, an energy major & federal owned enterprise of Argentina
- M/s. CAMYEN, a state-owned enterprise of CATAMARCA province of Argentina

KABIL has also signed a non-binding MoU with the Far East Investment & Export Agency of Russia and further discussions are underway.

5.17 It is planned that through these MoUs the shared information dockets entailing prospective mineral acreages will be jointly evaluated such that due diligence – technical, commercial, regulatory, statutory etc. can be carried out for investment decisions and after the approval process definitive agreement will be signed for commercial negotiation and acquisition of participating interest or equity in the projects by KABIL.

6

<u>Attached Offices /</u> <u>Subordinate</u>

Annual Report 2020-21

Attached Offices /Subordinate

Attached Offices / Subordinate

Geo	logical Survey of India	Page -	53
•	Organisation of GSI Mission	Page -	53
•	Mission I	Page -	54
•	Mission - II	Page -	57
•	Mission - III	Page -	58
•	Mission - IV	Page -	62
•	Mission - V	. Page -	65
•	Central Geological Programming Board	. Page -	65
•	Quality Management Cell of GSI	. Page -	68
•	Memorandum of Understanding (MoU) signed during the period	Page -	69
India	an Bureau of Mines	. Page -	74
•	Key activities and functions of IBM	. Page -	76
•	Inspection of mines	. Page -	76
•	Mining Plan, Review of Mining and Mine Key activities and functions	Page -	78
•	Mining Tenement System (MTS)	. Page -	86
•	Sustainable Development Framework (SDF)	Page -	86
•	Mining Surveillance System (MSS)	.Page -	87

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 later years, GSI diversified into various geoscientific activities. and made contributions in geosciences and resultantly, in the economic growth of India. The key functions of GSI are creation and updation of national geoscientific and assessment of mineral information resources.

Towards these, GSI has taken up ground, airborne and marine surveys, mineral exploration, multi-disciplinary geoscientific, geo-technical, geo-environmental and natural hazard studies, glaciology, seismotectonics, and fundamental research.

GSI, headquartered at Kolkata, has six Regional offices located at Lucknow, Jaipur, Nagpur, Hyderabad, Shillong and Kolkata, and has State Unit offices in almost all States of the country (**Figure 6.1**).



Figure 6.1

Organization of GSI Mission

6.2 The activities of GSI are carried out through five Missions viz. Baseline Geoscience Data Generation (Mission-I), Natural Resources Assessment (Mission-II),

Geoinformatics (Mission-III), Fundamental and Multi-disciplinary Geoscience and Special Studies (Mission- IV), and Training and Capacity Building (Mission-V). Besides these, three Support Systems viz. Policy Support System (**PSS**), S&T Support System (**STSS**) and Administrative Support System (**AdSS**) have been created to provide support and crosscutting co-ordination in GSI.

MISSION I: BASELINE GEOSCIENCE DATA GENERATION

6.3 Systematic Geological Mapping

Systematic Geological Mapping (SGM) (1:50,000 scale) is the most fundamental and basic mapping program of GSI. The whole country, excluding a few patches of inaccessible and difficult terrains, has been covered under this program. Out of the total mappable area of 3.146 million sq.km. of the country, 3.119 million sq.km. has been covered till December, 2020 bringing the total coverage to 99.14%. As the rest of the areas are totally inaccessible, therefore SGM programmes have not been mounted after March 2018 Bhukosh is a gateway to all geoscientific data of GSI, which can be accessed through the following web link:

http://bhukosh.gsi.gov.in/Bhukosh/ MapViewer.aspx



The data generated through SGM has immense application in exploration and other activities. The data generated through this mapping activity has helped to build up the knowledge base and data base for National Geo-scientific information. This knowledge base has been providing the baseline data to earth science related socio-economic activities and programmes of the Nation.

The areas which have not been covered under SGM are the inaccessible terrains of the northeastern parts of the country in the States of Assam, Arunachal Pradesh, Nagaland, Manipur and Meghalaya, the mountainous terrains of the Northern Himalayas in the States of Jammu & Kashmir and Uttarakhand, the Jarwa/Sentineli - inhabited islands of Andaman & Nicobar, and the Abujhmar Plateau of Chhattisgarh and Maharashtra.

6.4 Specialized Thematic Mapping

Wherever it is felt that the geology is complex, and more information on a specific theme needs to be revealed, Specialized Thematic Mapping **(STM)** is taken up. This mapping is carried out on 1:25,000 or larger scale. It involves collection of multidisciplinary data, and is backed by advanced laboratory studies. STM plays a pivotal role in natural resource prognostication through generation of spin off preliminary mineral investigation programmes (mostly G4 stage). Till December, 2020, an area of about 0.329 million sq. km. (including 17,490.40 sq. km. area mapped in 2020) has been mapped.

6.5 Geochemical Mapping

The National Geochemical Mapping (NGCM), in implementation since Field Season 2001-2002, aims to create a seamless baseline geochemical base map of 64 elements (details in Annexure 6.1) on 1:50,000 scale for the entire country. However, presently 62 elements are analysed except Platinum & Palladium (Pt & Pd). The data helps in deriving anomalous zone(s) of elemental concentration, which may be prospective for future mineral investigation. It also finds application in environmental, agricultural, human health and other social concerns. The elemental analyses of NGCM samples are being done in the laboratories of GSI as well as other like government organizations National Geophysical Research Institute (NGRI), Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC) and National Metallurgical Laboratory (NML).

The procedure follows international standards, which are considered benchmarks for deciding anomalous value of different elements for preparation of geochemical anomaly maps. For detailed reports visit website of GSI at www.gsi.gov.in.

On the basis of geological mapping and other baseline geoscience and mineral exploration data, GSI has demarcated an area of 0.571 million sq. km. in the country with Obvious Geological Potential (**OGP**). To systematically cover this 0.571 million sq. km. area, toposheet area of 0.813 million sq. km. area is to be mapped.

The entire accessible OGP area has been covered under NGCM by March 2019. However, in the non-OGP part of the country, NGCM is in progress. During January to December 2020, 0.095 million sq. km was covered by NGCM. Till December 2020, about 1.241 million sq. km. area [including OGP] has been cumulatively mapped under NGCM.

As an outcome of NGCM programme, numbers of spin-off mineral investigation items are already taken up since field season 2013-14.

6.6 Geophysical Mapping

Geophysical mapping under the National Geophysical Mapping Program (NGPM) comprises ground gravity and magnetic survey on 1:50,000 scale. It aims at generating a baseline ground gravity-magnetic data and prepare anomaly map of the country. The analysis and interpretation of data will facilitate in deriving the crustal architecture and delineating the mineral prospective zones. The NGPM was initiated in Field Season (FS) 2002-2003 and the entire OGP area is planned to be completed by 2020-21. The results of the NGPM survey are integrated with other available geological data set and further mineral exploration programmes are launched in the areas delineated by integration study.

During the period from January to December 2020, an area of 67,120.5 sq.km. was covered, thereby taking the total coverage to 0.803 million sq.km.

6.7 Airborne Survey

Airborne geophysical surveys are being carried out by GSI with the fixed-wing Twin Otter Aircraft Survey System (TOASS) consisting of Magnetic and Gamma Ray Spectrometric Sensors.

During FS 2019-20 (till March 2020), a total of 42,993 L km. was covered through TOASS survey over Banswara-Udaipur area in parts of Rajasthan.

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

GSI has launched project called the "National Mapping Aero-Geophysical Program" (NAGMP) in April, 2017, to acquire uniform aero-geophysical data over OGP areas (divided in 12 blocks). Till March 2020, total 0.269 million sq. km. area was covered against the target of 0.778 million sq.km. The project is aimed to delineate concealed, deep seated structure/litho-units capable of hosting mineralization, delineate extension of the existing mineralized zone and understating of shallow crustal architecture in the context of mineral occurrence. The project is being funded by National Mineral Exploration Trust (NMET).

The Project Implementing Agencies [PIAs] have been selected through global tendering. First phase of the survey, in four OGP Blocks (Block 1-4) covering 1,80,527 sq.km.in the states of Rajasthan, Gujarat, Madhya Pradesh, Uttar Pradesh, Chhattisgarh and Maharashtra has been completed. Based on this data, about 110 target areas for exploration or search for minerals has been delineated. As a follow up, total 14 reconnaissance projects including 1 Regional Mineral Targeting on molybdenum, base-metal, REE, phosphorite, diamond etc. are under execution in parts of Madhya Pradesh, Uttar Pradesh and Rajasthan. The acquired data has also been shared with NMDC for diamond exploration activities in Madhya Pradesh.

The second phase of the survey (Block 5-8 covering an area of 3,11,846 sq. km.) could not be initiated due to legal issues and third phase of the survey (Block 9-12 covering an area of 2,86,268 sq.km.) commenced from April 2019 and data acquisition over an area of 88,279 sq. km. has been completed as on March, 2020 but the survey operation was suspended after March 2020 due to restriction imposed to negate the prevailing pandemic (Covid-19) situation.

6.9 Hyperspectral Remote Sensing Technique in Exploration

During FS 2020-21, Photo Geology and Remote Sensing (**PGRS**) Division has taken up mapping of alteration/ mineralized zones on 1:50,000 scale using Multispectral and Hyperspectral remote sensing data and spectro-radiometer covering 11,984 sq.km. in potential areas of Udaipur, Pali and Rajsamand districts, Bhinder-Kaduni-Udpur and Badi Sadri Area, in Rajasthan; Sadur and Penakacherla schist belt, Chitradurga schist belt, Karnataka; Sonbhadra district, Uttar Pradesh and Sidhi district, Madhya Pradesh; Gaya, Nalanda and Jehanabad districts, Bihar; Chhatarpur district, Madhya Pradesh and Jhansi district, Uttar Pradesh; Bhandara and Gondia districts of Maharashtra and Balaghat district of Madhya Pradesh; Gondia district of Maharashtra and Bhalaghat district of Madhya Pradesh 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.

As a part of the MoU with National Remote Sensing Centre- Indian Space Research Organisation (NRSC-ISRO), two projects have been taken up in FS 2020-21. One of the projects is on utilisation of Advanced Visible Infra-Red Imaging Spectrometer-Next Generation (AVIRIS-NG) hyperspectral data by the scientists of GSI and ISRO to detect surface signatures of mineralization in 14 promising areas in different parts of country in three years. Six promising areas falling under the purview of MoU, namely Udaipur-Zawar & Bhukia, Rajasthan; Ambaji, Gujarat; Chhatarpur, Madhya Pradesh; Wajrakarur, Andhra Pradesh; Tundi, Jharkhand and another promising area Gadag, Karnataka have been taken up covering total area of 3694 sq. km, with an objective to prepare surface mineral map / alteration mineral map / updated host rock map, identify potential areas for mineral exploration and develop spectral library for rocks and minerals of the study areas. The other project is rock phosphate mapping in Jhabua area in Madhya Pradesh covering an area of 850 sq. km. GSI reports are available at the following web link:

https://www.gsi.gov.in/webcenter/portal/OCBIS/ pageReports/pageGsiReports? adf.ctrlstate=lkmiwvf05 35& afrLoop=757098779172607#!



6.10 Marine and Coastal Surveys

The Exclusive Economic Zone (EEZ) of the country is being explored for its mineral resources by GSI, in coordination with National Institute of Oceanography (NIO) and National Centre for Polar and Ocean Research (NCPOR). GSI acquires baseline data on bathymetry [sea bottom topography], sea surface sediment distribution, gravity, magnetic, etc. within the EEZ of India. An area of 2.005 million sq. km. out of a total EEZ area of 2.015 million sq.km. (on 1:5,00,000 scale) accounting for 99.51% EEZ has already been covered. GSI has been carrying out this survey with its own research vessels.

GSI also carries out focused mineral investigations and deep sea multichannel seismic surveys in identified target areas. Besides, preliminary marine mineral investigation over an area of 1,75,344 sq.km. has been completed till December 2020, out of the targeted potential area of 5,89,560 sq. km. within the EEZ of India by the Research Vessel Samudra Ratnakar (29.74% coverage in preliminary exploration target area). During the period from January to December 2020, preliminary marine mineral investigation has been carried out over an area of 21,114 sq.km. within the EEZ.

Continuous survey since 1985 has paved the way for demarcation of prospective areas of offshore heavy minerals and construction sand within the Territorial Waters (TW) off east and west coasts of India. GSI has estimated an inferred resource of 78.88 million tonnes of Total Economic Heavy Minerals (TEHM),

considering seabed sediment up to 1m below seafloor and cut off wt. % of heavies > 3 within the TW off India. A total of 745.323 million tonnes of construction-grade sands have been estimated from four sectors off Kerala within the west coast of India with maximum sub surface depth of 2m and having sand content >80.

GSI could demarcate 12,767 sg.km. potential zones with 1,15,538 million tonnes inferred resource of high-grade lime mud and lime sand within the EEZ off Gujarat and Maharashtra. Besides these, occurrences of phosphate bearing sediments, and Fe-Mn encrustations have also been identified off Tamil Nadu coast and in the Andaman Sea, within the EEZ of India. Based on GSI's survey and exploration with its fleet of research vessels, scientific program proposals are being planned and executed regularly to meet the data and knowledge gaps in offshore survey.



Figure 6.2: Polymetallic nodule collected from West Sewell Rise, Andaman Sea

MISSION Natural 11: Resources Assessment

6.11 Mineral Resource Assessment

The mineral exploration activities of GSI have been prioritized keeping in view the thrust areas identified by Government of India and State Governments. GSI carries out 'reconnaissance survey' [G4], 'preliminary exploration' [G3] and 'general exploration' [G2] following the guidelines of United Nations Framework Classification (UNFC) 1997 and Minerals (Evidence of Mineral Contents) Rules, 2015.

During FY 2020-21, a total of 218 investigation programs were taken up by GSI, which include 18 projects on 'offshore mineral investigation', 160 projects on Mineral Exploration [22 on Ferrous Minerals, 23 on Precious Metals and Minerals, 88 on Non-Ferrous and Strategic Minerals, 27 on Industrial and Fertilizer Minerals] and 24 projects on Natural energy resources [17 coal, 3 lignite, 2 shale gas and 2 geothermal], 10 Regional Mineral Targeting (RMT) projects, 4 R&D projects and 2 projects on Uncover (India).

6.12 Natural Energy Resources [Coal and Lignite]

GSI has augmented in 2020-21 (till December 2020) coal resources of 2148.66 million tonnes in various coalfields including Godavari Valley (Telangana), Rajmahal Coalfield (Jharkhand), Raniganj Coalfield (West Bengal), Birbhum Coalfield (West Bengal), Mand-Raigarh (Chhattisgarh) and Singrauli (Madhya Pradesh).

No lignite resource has been augmented by GSI in the year 2020-21 (till December, 2020).

6.13 Geothermal Studies

During the FS 2020-21, geothermal studies are being carried out in Maharashtra and Bihar with the objective to delineate and define the geothermal resource characters.

Mission III: Geoinformatics

6.14 Geoinformatics aims at comprehensive management and effective utilization of all geoscientific information so as to deliver accurate, up-to-date and comprehensive products and services, and provide crucial support to all missions of the organization as well as the stakeholders. The mission is actively involved in maintenance and management of the IT infrastructure, archival of the datasets, policy making and planning for inclusive IT enablement of the organization.

6.15 Mission III A: Data Repository and Management, Advanced Spatial Data System, IT Infrastructure & Connectivity **OCBIS**

The Online Core Business Integrated System (OCBIS) portal is an integrated enterprise portal connecting all users, core processes, data and support systems in a web-based platform. This was initiated in 2015-16 and became operational since 2017-18 for most of the modules across all GSI offices

6.16 Mission-III A: Data Repository and Management

The OCBIS portal consists of 31 Modules (4 e-Govapplications, 8 Core Modules, 12 Support Modules and 7 other modules) comprising of 125 processes. In Content Management System (CMS), various documents, maps and progress reports are uploaded.

[https://www.gsi.gov.in/webcenter/portal/OCBIS/ pageReports/pageGsiReports?adf.ctrlstate= d5puo2xdt 5& afrLoop=288450923 10189188#!]



6.17 Mission-III A: Advanced Spatial Data System

OGC Compliant Bhukosh Map Service is the geoscientific data repository with latest Geodatabase (.gdb) and Map Exchange Document (.mxd) for viewing multi-thematic map layers like Geochronology, Geothermal, Glacial Retreat, Mineral, Tectonic, NGCM-NGPM, Seismotectonic, Meteorites, Marine EEZ. Marine TW, Geology (2M) and

Geomorphology (250K) which facilitate the users to visualise, query data, create maps and download. A total of 151 geospatial layers with 12578445 features and 2553 geophysical

datasets are available till date. This is available at the web link:

https://bhukosh.gsi.gov.in/Bhukosh/Public





Photo 6.1: BHUKOSH: Gateway to all Geoscientific Information of GSI

6.18 Mission III B: Publication & Library

The major categories of GSI publications available in OCBIS portal are Memoirs, Bulletin Series A, B & C, Records, Special Publications, Miscellaneous Publications, Catalogues, Palaeontologia Indica and Indian Journal of Geosciences (in-house quarterly journal of GSI). 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 cover 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.

Total eleven scientific publications have been released during January 2020 to December 2020.E-News gets released from different Regions and CHQ annually or biannually. Newsletter of GSI is being prepared and uploaded in GSI portal on monthly basis.



Photo 6.2: Glimpses of GSI publications available in OCBIS portal [viz. Memoirs, Bulletin Series, Records, Palaeontologia Indica and Indian Journal of Geosciences (in-house quarterly journal of GSI)]

6.19 Mission III C: Map, Geoinformatics & Data Integration

GSI has been mandated to prepare and publish both analog and digital geological maps / map databases for the entire country. This mission includes compilation of maps like Geological Quadrangle Maps (**GQM**), District Resource Maps (**DRM**), Geological and Mineral Maps of States, Mineral Belt Maps (**MBM**), Coal Field Maps, etc. Several thematic maps covering pan India are being compiled under this Mission.

The Mission has completed all India Projects in digital format like Compilation and updation of 1:20,00,000 Geological Map of India from
1:50K GDB, Revision of Seismotectonic Atlas of India and its Environs [**SEISAT**] updating it to digital (**GIS**) version (up to 2019 data).

The Mission is also updating and maintaining the geodatabases, map services and map related thematic applications in Bhukosh (OCBIS Geoportal).

Further, Mission IIIC is presently attending to the following projects at various locations of GSI:

- Compilation and preparing a separate geo-database for Thematic Geological Maps in 1:25K scale of selected belts of India in regions, where such mapping has been carried out by GSI.
- Synthesis and collation of All India National Geochemical Map data (NGCM) and National Geophysical Map data (NGPM) on 1:50,000 scale and their uploading on Bhukosh (OCBIS Geoportal): The project aims for Standardization and finalization of NGCM and NGPM data through map service in BhuKosh, OCBIS GeoPortal.

- Creation of National Geoscience Data Repository (NGDR) in GSI.
- Development of Geoscientific data based on arsenic distribution pattern at Nakashipara and Tehatta I & II Blocks, Nadia District, West Bengal to understand arsenic pollution visŕ-vis human manifestation and its remediation / mitigation through spatial data integration modelling.
- The compilation and publishing the Sea Bed Sediment Maps of Territorial Water (TW) and Exclusive Economic Zone (EEZ).
- Geological Quadrangle Maps (4 nos., first edition, North Eastern Region).
- Mineral Belt Maps (03 nos. from ER, 01 no. from NER, 09 nos. from WR).
- DRM (11 nos. of Maharashtra, 8 nos. of Chhattisgarh; 11 nos. of MP; 2 nos. of Jharkhand; 4 nos. of Manipur; 15 nos. of UP; 29 nos. of Telangana; 9 nos. of Rajasthan).



Photo 6.3: Seismotectonic Atlas of India available in BHUKOSH-OCBIS portal

- Geology & Mineral Map of Kerala & Tamil Nadu and Odisha.
- Seam less geological map of Central Region.
- Development of Geo-scientific database on fluoride distribution pattern at Warora and Bhadravati areas of Chandrapur and Yeotmal District, Maharashtra.
- Creation of smart maps integrating multi thematic spatial and non-spatial data for development of Smart City of Amaravati, Andhra Pradesh are carried out from SR.

A map service has been created and operational in BHUKOSH Geoportal to visualize the data along with geology and geomorphology. Visualisation of the elemental values for NGCM, Soil-C and Regolith data and NGPM gravity and magnetic anomaly data through contouring has been implemented in BHUKOSH Geoportal.

During the period, at Central Headquarters, Kolkata following maps were also scrutinized prior to publications by Map & Publication Division of GSI : Geological and Mineral map of Nagaland, (1:1M, 4th revised edition), Geological and Mineral map of Tripura (1:1M), Geological and Mineral map of Assam (1:1M), Geology and Mineral map of Haryana (1:1M, 3rd revised Edition), Geology and Mineral map of Meghalaya (1:2M) Geology and Mineral map of Jharkhand (1:2M) and Geology and Mineral map of Bihar (1:2M).

6.20 MISSION IV: Fundamental and Multidisciplinary Geosciences and Special Studies

National Mission IV, with Headquarters at Kolkata, is structured under three submissions:

- (i) Geotechnical Geohazards Management (M-IVA)
- (ii) Climate Change & Eco systems, Polar Studies, Environmental Geology, Medical Geology & Bio-geohazards (M-IVB)
- (iii) Fundamental Geosciences & Research (M-IVC).

During FS 2020-21, 163 items were taken up under Mission-IV which includes 86 items of M-IVA, 23 items of M-IVB and 54 items of M-IVC.

The major activities pursued by GSI in M-IVA centre around developmental and societal issues related to Geotechnical projects, and Landslide studies and Seismotectonic studies.

During FS 2020-21, Geotechnical investigations have been executed to provide geological and geotechnical inputs to the infrastructure and authorities. engineering project Under landslide study, the prototype Rainfall induced Landslide Early Warning System (LEWS) is under development in collaboration with British Geological Survey (BGS) under the project. Geological Survey of India has recently prototype technique developed а on forecasting rainfall-induced landslide on regional scale (LEWS-Region), through its participation in a multi-consortium based international research program (LANDSLIP, www.landslip.org) in 🛛 🗰 🗖 since 2017 collaboration with the British Geological Survey.

GSI started issuing prototype landslide forecast bulletins on a daily basis for the two test areas (Darjeeling district, West Bengal, w.e.f. 1st July, 2020 and Nilgiri district, Tamil Nadu, w.e.f. 17th July 2020). The daily issuance of Darjeeling bulletin was stopped on 13.11.2020 after the end of the SW monsoon, whereas the same

is still continuing in the Nilgiris district, Tamil Nadu for evaluating the effect of NE monsoon. The prototype applications of LEWS-Region in Darjeeling district, West Bengal during 2020-monsoon has also been evaluated through a post-monsoon e-workshop by GSI/ LANDSLIP along with the State Disaster Management Authority (SDMA) - West Bengal and District Disaster Management Authority (DDMA) - Darjeeling district on 14.12.2020, wherein several feedbacks from all the stakeholders on the evaluation of the prototype applications were discussed for collating the lessons learnt so far for further model improvement and evaluation for experimentation in the coming monsoon of 2021. After the end of NE-monsoon in Nilgiris, similar post-monsoon evaluation will also be taken up along with the concerned SDMA/ DDMA authorities of Tamil Nadu. For LEWS-Region, GSI has prepared a strategy plan to extend similar experimentation in 10 landslide prone States by 2025, including augmentation of its infrastructure for establishing a state-ofthe-art landslide forecasting facility at GHRM Centre, Kolkata, which has been approved by the Ministry of Mines during August 2020, so that in near future, the landslide forecasting in India could be made operational.

In landslide sector, GSI has already prioritized its investigations on meso scale (1:10,000) and site specific (1:1000/2000) scales for generating more detailed scientific inputs for directly using the same in detailed developmental planning and site-specific landslide mitigations. During 2020, GSI has taken up 14 (fourteen) 1:10k projects and has also been taken up detailed site-specific landslide investigations for 13 (thirteen) active landslides, out of which 11 landslides are located along Jammu-Kashmir National Highway, which GSI took up on priority at the requests of Secretary, NDMA. In the ongoing National Landslide Susceptibility Mapping (**NLSM**) program, GSI has so far completed 1:50k landslide susceptibility mapping for 3.63 lakh sq.km. areas spreading over 18 landslide-prone States/UTs, which constitute 85% of the total NLSM target. The remaining task in Arunachal Pradesh (~70,000 sq.km.) will be completed by March 31, 2022. GSI has already uploaded the above GISenabled landslide susceptibility map data of 3.63 lakh sq. km. areas on its Bhukosh map portal (https://bhukosh.gsi.gov.in/ Bhukosh/Public) for free downloading and use by all stakeholders and the community.

Along with the 1:50k landslide susceptibility map, the above vital geodata also contains 61,287 landslide incidences as polygons and 29.972 field validated landslides as landslide inventory points with detailed geoparametric attributes. Till December 2020, 753 non-GSI registered users from 412 different affiliations have so far downloaded the above societal data from GSI's Bhukosh Map Portal by raising 7118 online downloading requests to GSI. Moreover, this national level landslide geodatabase is now mirrored with the GIS map portal services of the National Disaster Management Authority (NDMA) through Web Map Service (WMS) for integrating the same vital geodata with an aim to use it for landslide disaster management plans by different landslide prone States/ UTs.

Seismotectonic studies are being done through Geodynamic Studies Division (**GSD**) and Seismo-GeodeticDataReceiving and Processing Centre (**SGDRPC**) situated at Kolkata. They are carrying out real time recording, monitoring and scientific study of earthquakes through its DGPS and seismograph observatories established in different parts of the country.

Out of the total 35 planned DGPS stations, 30 permanent GPS stations have been installed in different parts of the country and data from these locations are being analysed to monitor

crustal movement and establish strain model by GSD. The remaining 5 permanent GPS stations are planned/ expected to be installed by March, 2021.



Photo 6.4: @LANDSLIP_NERC, @SHEAR_Programme annual meeting hosted at @teriin

(Source: Twitter @LANDSLIP_NERC)

Under M-IVB, glaciology projects are being pursued to study the recessional pattern and mass balance of the glaciers in Higher Himalayas, identify the potentially areas for high Glacial Lake Outburst Flood (GLOF) risk and update the inventory of Himalayan glaciers. 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 being carried out. Under the public good geosciences societal cause projects, and geogenic contamination of surface/ sub-surface water with Arsenic (As), Fluoride (F), Lead (Pb) and other toxic elements are being studied under Environmental Geology programs in Uttar Pradesh, Bihar, Tamil Nadu, Andhra Pradesh, Rajasthan and Madhya Pradesh and the National Capital Region of Delhi.

In M-IVC, the fundamental research in three principal branches of geosciences viz., Petrology, Palaeontology, and Geochronology & Isotope Geology is being carried out. The other branches are Meteorite and Planetary sciences, Gemmology, Himalayan Geology, Volcanology, Quaternary geology and Experimental petrology. GSI has been declared as the Nodal agency and curator of all Meteorite Falls and Finds within the Indian Territory. The Gemology Laboratory, NCEGR, Kolkata is extending paid (as per SoC) services

to public in identifying purity of gems and precious stones including diamond. GSI uses state-of-the-art advanced instrumentations. The EPMA Laboratory, NCEGR Bangalore has analysed REE minerals under the Research Project undertaken in Raichur District, Karnataka.

Out of 163 standard items, carried out during FS 2020-21, outcome of 109 items would have direct societal benefits and 22 items exclusively on ore/mineral genesis, modelling and characterization.

MISSION V: Training and Capacity Building

6.21 Human Resource Development

Geological Survey of India Training Institute (**GSITI**) is presently running training programs at nine centres 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). The Hyderabad Centre is designated as the headquarters for all other eight centres of onsite field training and has specialized divisions for laboratory and classroom trainings.

During the period from April 2020 to December 2020 as a part of FS 2020- 21, 163 (FSP-122, Additional-41) training courses were conducted for 16,033 personnel (4959-GSI, 483-DGMs and 10,591-Others). In total, during January to December 2020, 171 (FSP124, Additional 47) training courses were conducted for 16,711 participants (5614-GSI, 488-DGMs and 10,609-Others).

In the period from January to March 2021, 11 (FSP-05, Additional-06) trainings are contemplated that include two international courses for about 40 participants in Geographic Information System and Remote Sensing & Digital Image Processing for foreign nationals under Indian Technical and Economic Cooperation (**ITEC**) program sponsored by MEA.

With a view to spreading the awareness about the expertise of GSI in the field of earth sciences, and enhancing its visibility in the society, the Ministry has launched the "BHUVISAMVAD" platform in June 2018. Under BHUVISAMVAD, from January 2020 to December 2020, 59 training programs were conducted for 8,594 participants. In addition, as per the directive of Ministry of Mines, GSITI conducted 36 e-Trainings for academicians and trained 8,112 participants from Pan-India. Out of that, 18 e-Trainings were exclusively for SC & ST Faculty, Research Scholars, PG & Post PG students of Academic Institutions that benefited 1647 participants from the community.

PSS: POLICY SUPPORT SYSTEM

6.22 Central Geological Programming Board

The Central Geological Programming Board (**CGPB**) is the apex body at the national level under the chairmanship of Secretary, Mines, to overview the programme of geoscientific activities including mineral exploration in the country. It was established through Government of India's Resolution dated 27th July, 1966 and subsequently revamped vide Ministry of Mines' Resolution No. 4(2)97-M.I dated 12th March, 2009, with 12 theme-based committees. Subsequently, the State Geological Programming Boards (**SGPB**) came into being in every State to coordinate the activities in the States, complementing the CGPB and to interface with CGPB and GSI.

GSI is the nodal department (Member Secretary) and the State Geology and Mining departments and Central Government agencies, PSUs, other Ministries and industry representatives are the participating members. The revamped CGPB comprises members from nine Ministries of the Government of India, Advisor (Mineral) of Niti Aayog, 28 Central Organisations, 10 representative industries/ industrial bodies, Secretaries (Mining and Geology) of State Governments, Directors of Geology & Mining of States and representatives of Ministry of Mines and GSI and other special invitees.

The CGPB meeting, chaired by the Secretary, Ministry of Mines, is organized annually to discuss the geological programs, and the related issues and concerns of the state governments, central institutes and other stakeholders working in mineral exploration and other geoscience fields. It provides a direction to the stakeholders in taking up various geoscience programs individually or in collaboration with other organizations in the country.

The Field Season Program of the Geological Survey of India is also placed before the august gathering to avoid duplication of work. The main recommendations of the CGPB Committees and SGPBs which are held prior to the main CGPB meeting are also deliberated upon in the meeting. Exhibitions and presentations on currently relevant geoscience topics are integral part of this meeting. Since its inception in 1966, a total of 59 CGPB meetings have been held.

The 59th CGPB meeting was scheduled to be held on 19th March 2020. However, because of the outbreak of COVID-19, it was decided to conduct the meeting through email circulation. Ministry of Mines

A total of 104 Agenda points were received from various stakeholders. The main agenda of the 59th CGPB was focused on various technical and administrative issues related to mining lease, exploration and mining policy, forest clearance, initiation of collaborative projects involving State Governments, Central Agencies and Research Institutes etc.

Accordingly, the Agenda Notes were circulated to the stakeholders, and their responses were compiled. Subsequently the final Agenda Notes were circulated to all stakeholders after obtaining due approval of the Secretary, Ministry of Mines and Chairman, CGPB for further necessary action.

Preparations for the 60th CGPB were also made during the period of reporting. The Departments of Geology and Mining (DGMs) of other states were constantly pursued with for holding of the SGPB meeting and submission of the minutes. As on date, the minutes of 14 SGPB meetings have been received by CGPB Secretariat. This includes Arunachal Pradesh, Jharkhand, Haryana, Chhattisgarh, Orissa, Manipur, Meghalaya, Mizoram, Nagaland, Uttar Pradesh, West Bengal, Sikkim, Tamil Nadu, and Madhya Pradesh. The highlights of the SGPB meetings are as under:

- A joint venture by GSI and DGM Nagaland for site specific and meso scale (1:10,000) investigation of landslides to mitigate landslides in the State is to be initiated.
- DGM Chhattisgarh has informed the completion of exploration of 03 bauxite and 02 limestone blocks out of the 14 projects approved during Phase I and 01 bauxite block out of the 03 approved during Phase II by NMET.

- GSI has informed that the details on the landslide studies in Nilgiri District will be shared with DGM, Tamil Nadu after compilation of report.
- A book on the studies conducted in all landslide areas in the country is to be published by GSI.
- DMR, Meghalaya has requested the help of GSI to prepare district-wise minerals maps, reserves of different minerals and ultimately state mineral map in the coming year
- DGM, Arunachal Pradesh extended administrative and logistic support to GSI for G2 and G3 exploration projects in Taliha-Dupit area, Upper Subansiri district.
- DMM, West Bengal has initiated the development of a web portal for online mineral administration.
- MRD, Madhya Pradesh has successfully auctioned 13 mineral blocks and has planned auctioning of 17 more blocks in the upcoming months.
- DGM, Manipur has submitted proposals to GSI for two G4 investigations and one preliminary exploration for chromite in future.
- DG, Odisha, informed that during FS 2020-21, 4 Base-metal items including three G2 and one G3 has been taken up by GSI. On the request of DG, Odisha, G2 stage exploration for Gold in Gopur and Gajpur area will be taken up during FS 2021-22.

The 12 CGPB Committee Meetings (16th CGPB Committee Meetings) were conducted in the months of September and October, 2020 as per the schedule via videoconferencing. Till

date, the minutes of 11 CGPB Committees have been received. This includes CGPB Committees-I, II, III, IV, V, VI, VII, VIII, IX, XI & XII. The highlights of the decisions/ recommendations of the CGPB committee meetings are as follows:

- Prioritization of exploration of nonworking leases which have expired so that the deposit can become auctionable.
- Research and development efforts for beneficiation or utilization of low-grade ore.
- Identification of future exploration areas (Green field) for Diamond, Gold and PGE exploration.
- Submission of exploration data by all stakeholders for incorporation in the National Mineral Inventory (NMI) which is prepared by IBM.
- Digitization of geological maps by State DGMs.
- Sharing of the Heliborne magnetic, Gamma Ray Spectrometric and Electromagnetic data as per guidelines of Ministry of Defense.
- Sharing of mineral exploration reports and data with National Geoscience Data Repository (NGDR) by stakeholders.
- Provision of the template regarding stage wise mineral exploration for Industrial & Fertilizer Minerals by National Mission Head-II (NMH-II), GSI to all State DGMs.
- The constitution of a five-member committee under the chairmanship of Neyveli Lignite Corporation India Limited (NLCIL) with the members from GSI, MECL, Central Mine Planning and Design Institute (CMPDI) and Central Institute

of Mining and Fuel Research (**CIMFR**) for recognition of suitably qualified and experienced persons or Organization for preparation of Geological Report (GR) in case of Coal and Lignite exploration.

- Unanimous acceptance of the following members as special invitees of CGPB Committee- VI (Marine Geology & Exploration and Coastal Geosciences) :
 - i. NationalInstituteforInterdisciplinary Science and Technology (NIIST), Thiruvananthapuram
 - ii. IREL (India) Limited, Mumbai
 - iii. Central Marine Fisheries Research Institute (**CMFRI**), Kochi
 - iv. Department of Geology, Andhra University, Vishakhapatnam
 - v. Cochin University of Science and Technology (**CUSAT**), Kochi
 - vi. Indian Institute of Technology, Chennai
 - vii. National Physical Oceanographic Laboratory (**NPOL**), Kochi
 - viii. Department of Geology, Presidency University, Kolkata
- Expression of interest by National Remote Sensing Centre (**NRSC**) for collaboration with GSI regarding spectral geological mapping of OGP areas.
- Formulation of Standard Operating Procedures (SOP) on active fault studies by GSI keeping in mind the key issues like area selection, pre-field components, post field data analysis and its interpretation, etc. with necessary software component(s).
- Collaboration between GSI and Central

Ground Water Board (**CGWB**) for the preparation of SOP document on spring-shed mapping.

- Finalization of the SOP for meso scale landslide studies.
- Revision and updation of Smart City maps and Seismotectonic Atlas and its sharing through BHUKOSH in OCBIS portal soon.

Apart from the above, the updated Base Document of the CGPB Committee-II (Precious Metals and Minerals) was also released.

As part of the preparation for the 60th CGPB meeting, the Action Taken Reports of the 59th CGPB meeting and the Agenda Items for the 60th CGPB meeting are being obtained from the stakeholders. The CGPB Secretariat is in constant touch with the stakeholders for the purpose.

Considering the current Covid-19 situation, it is feared that travel and physical assembly of about 250 participants would be a major concern during the 60th CGPB meeting. Therefore, the 60th CGPB meeting will be conducted through circulation.

6.23 Quality Management Cell of GSI

The mandate of Quality Management (**QM**) Cell is to ensure quality of the FS proposals, GSI reports and to devise methodology and *modus operandi* in the form of Standard Operating Procedures (**SOP**) for different activities for improving the quality of services provided by GSI. All these are done with an aim to ensure satisfaction of the stakeholders and for meeting international standards.

As per the mandate, during 2020, GSI had undertaken external peer review of 20%

reports of FS 2017-18 circulated during FS 2018-19. Out of the 655 standard reports submitted by the six Regions and Central facilitates (CHQ) of GSI, 131 reports were randomly selected (domain-wise). The selected reports were sent for External Peer Review. Out of the 131 reports, 121 reports reviewed externally so far. The external peer review process for the reports of FS 2018-19 has also been initiated and 140 reports (20%) out of 698 reports have been selected randomly through OCBIS which will be sent for scrutiny/ peer review by external experts.

For monitoring the quality of the projects taken up in by GSI, 20% randomly selected proposals are passed through the process of external peer review. This process for the proposals of FS 2021-22 has been initiated in 2020 and will continue during the first quarter of 2021.

6.24 International Cooperation

The activities of GSI in the field of International Cooperation include bilateral collaborative programs with various foreign governmental organisations and scientific agencies, participation in international seminars/ symposia, facilitation of foreign visits to India for programs/trainings, and visit of officers abroad. The above activities are overseen by the International Affairs Division, GSI, CHQ.

During FS 2020-21, the division was actively involved in providing and facilitating technical and associated inputs/comments from GSI for Australia, Israel, Finland, Czech-Republic, Brazil, China, Zambia, Bolivia, Mozambique, Mexico, Argentina, Uzbekistan, Zimbabwe, Serbia, Saudi Arabia, Tanzania, Austria, Ecuador, Arctic regions and South– Asian Countries regarding formulation of MoU, agenda points for various meetings etc. Several correspondences were done for formulation of MoUs between GSI and Russian State Geological Holding (ROSGEO); Florida International University (FIU)-USA; CNR, IRPI-Italy; CPRM, Brazil; Geological Mining and Metallurgical Institute- Peru; Mineral Resource Authority- Mongolia, which are in advanced stage/active consideration.

6.25 Bilateral Collaborative Activities

GSI continued its participation in bilateral cooperation and collaborative programs with other countries on several geoscientific disciplines for mutual benefits. Activities are being taken up as per the signed MoUs with various countries.

Memorandum of Understanding (MoU) signed during the period

MoU with GTK, Finland: An MoU between the Geological Survey of India (GSI), Ministry of Mines of the Republic of India and the Geological Survey of Finland (GTK), Finland was signed on 3rd December, 2020 through e-platform under the Chairmanship of Dr. Ranjit Rath, Director General, GSI & CMD of MECL from GSI side and Mr. Mika Nykänen, Director General, GTK Finland from Finland side. The MOU envisages cooperation in the field of Geology and Mineral Resources for an initial period of five years. The MoU is expected to provide the exchange of knowledge and learning experience of two organizations in the field of different branches of Geology. After MoU singing ceremony, an online webinar through presentation of lectures from both sides was also conducted for knowledge sharing on different geological fields and methodologies by both the organisations.

(ii) **MoU with SJVN:** An MoU between Geological Survey of India and SJVN Ltd. was



Photo 6.5: MoU singing ceremony in the presence of Dr. Ranjit Rath, Director General, GSI & CMD, MECL and Mr. Mika Nykänen, Director General, GTK Finland on E-platform.



Photo 6.6: Deliberation of lectures during webinar for knowledge sharing

signed on 16th June, 2020 on construction Stage Geotechnical Services for Arun-III Hydroelectric Project (HEP), Nepal for an initial period of one year. Under this MoU, GSI agreed to provide technical consultancy for Arun-III HEP as per the requirement of SJVN Ltd.

Bilateral Meetings

Joint Working Group (JWG) Meeting with CPRM, Brazil: The first JWG Meeting under Memorandum of understanding (MoU) between Geological survey of India (GSI) and Geological Survey of Brazil – CPRM, Brazil on cooperation in the field of Geology and Mineral Resources was held at Khanij Kaksha, Shastri Bhawan, New Delhi through e-Platform on 12th November 2020 under the Chairmanship of Shri Upendra C. Joshi, Joint Secretary, Ministry of Mines and Co-chairmanship of Dr. Ranjit Rath, Director General, GSI & CMD of MECL.

Dr. Maria Glicia da Nobrega Coutinho, Head of International Affairs Office chaired the meeting from Brazilian side. During the meeting, mutual exchange of knowledge and expertise between two organizations in the field of REE-Critical-Strategic mineral exploration, Natural hazards, Marine Geology and Training and Capacity building in different spheres of Geology was agreed as initial collaboration. To execute the same, it was also decided that four subgroups/ 'domain experts' team would be identified from each side.

6.26 Collaborative Projects with Other Organisations:

A total of 14 collaborative programs have



Photo 6.7: The JWG Meeting between Geological survey of India (GSI) - CPRM Brazil was held on e-platform in the presence of Shri Upendra C. Joshi, Joint Secretary, Ministry of Mines, Dr. Ranjit Rath, Director General, GSI & CMD of MECL and Dr. Maria Glicia da Nobrega Coutinho, Head of International Affairs Office, CPRM

been taken up during the year 2020 with Indian Navy; Nuclear Power Corporation of India Limited (**NPCIL**); Directorate of Mines, Government of Odisha; Calcutta University; Central Ground Water Board; Drinking Water and Sanitation Department, Government of Jharkhand; RVNL, Rishikesh; CSIR-NGRI; DGM, Maharashtra; Birbal Sahni Institute of Palaeosciences (BSIP); IIT Kharagpur; IIT Roorkee; IIT Bombay; Indian Meteorological Department (**IMD**).

STSS: Scientific & Technical Support System

6.27 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 & NCEGR Faridabad have been accredited by National Accreditation Board for Testing and Calibration Laboratories, Government of India (ISO/IEC 17025:2017). 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: 2017 and NABL specific criteria(s) for applicable field(s).

The Re-assessment of all the laboratories has been done in the field of Testing as per ISO/IEC 17025:2017. All the laboratories have been participating in Proficiency Testing (PT) GeoPT Program and Inter Laboratory comparison on regular interval, and the performance of the laboratories were found satisfactory, i.e. Z score within ± 2 .

6.28 Modernization program in GSI

In order to establish GSI as a world class geoscientific organization, a modernization program was initiated in GSI in the XII Plan. The program aims at infusing state-of-theart technology in the various spheres of functioning of the organization.

During FY 2020-21, the major geological, chemical, geophysical and drilling instruments have been planned for procurement in which Hydrostatic Drilling Rigs 6 nos. and High-**Resolution Secondary Ion Mass Spectrometer** (HR-SIMS) have already been procured. The Instruments that are being procured during the period include Super Low Level Scintillation Counter Analyser, Electron Probe Micro Analyser (EPMA), Isotope Ratio Mass spectrometer (IRMS), Automated Thin Section Making Machine, Guelph Permeameter, ICPMS, XRF, SEM, Atomic Absorption

Spectrophotometer (**AAS**), Total Station, OSL Reader, WD-XRF, Direct Shear Testing Machine, Polarising Microscope with digital Camera imaging software etc.

Procurement planned for the FY 2021-22, are Lase Ablation High Resolution ICPMS (LA-HR-ICPMS), Real Time Seismic Monitoring Equipment and accessories, Hand Held XRF, Electron Probe Micro Analyser (EPMA), Lase Ablation Quadruple ICPMS (LA-Q-ICPMS), Transmission Electron Microscope (**TEM**), Ultra Magnetotelluric (MT) Data Acquisition System, Ground Penetration Radar (GPR), Crawler Mounted hydrostatic Drilling Rigs, Handheld LIBS, Automated Mineralogy SEM, Laser Raman Spectrometer, Portable XRD, Single Stage Accelerated Mass Spectrometer (SSAMS), Campaign Mode GPS tracking system, Gravimeter, Magnetometer, Advance petrological Microscope, WD-XRF etc.

6.29 Internal Resource Generation

During the period from 1st January to 31st December, 2020, a total of Rs 89,63,692/- has been generated as Internal Resource and Rs.16,32,556/- collected as 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 and unpublished reports, providing analyses of samples (petrological/ chemical/ mineral physics/ geotechnical Labs), Electron Probe Micro Analyser (**EPMA**) studies, gem testing, mineral exploration etc.

The Anticipated data for January-March, 2021is IRG=25,00,000/- (approx.) and Service Tax and Cess= Rs.4,50,000 (approx.).

6.30 Activity-wise budget expenditure of GSI against the approved budget grant during the 2019-20 and the activity wise total BE grant and expenditure till December, 2020 of FY 2020-21 is given at **Annexure 6.2**.

Human Resources

6.31 Out of the total sanctioned strength of GSI i.e. 12,189 as on 31.12.2020, 6005 posts are occupied. The group-wise sanctioned strength of personnel as on 31.12.2020 is given in **Table 6.1**.

Table 6.1Statement showing category-wise details of sanctioned & filled up strength in GSI

						(45 611 5 1112	
Class	Sanctioned Strength	Men in position	SC	ST	OBC	No. of women	PH
Group-A	3900	2701	457	209	749	768	28
Group-B (Gaz.)	786	537	110	58	133	96	11
Group-B (NG) (Min.)	1130	671	109	68	52	128	11
Group-B (NG) (Tech.)	1524	327	57	44	14	26	3
Group-C (Min.)	925	457	75	38	81	76	7
Group-C (Tech.)	1924	453	67	47	69	18	8
MTS (Erstwhile Gr-D)	2000	859	233	118	145	143	31
TOTAL	12189	6005	1108	582	1243	1255	99

(as on	31.12.2020)
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6.32 Public Relation and Media Management

PR and media cells have been operational in all the regional headquarters of GSI in coordination with CHQ, Kolkata. Highlights of GSI activities and achievements are being shared regularly with media using press releases, press conferences, social media posts, influencer programs, TV/Radio talk shows etc. There is steady increase in the visibility of GSI's activities and achievements in all the media platforms throughout the year. GSI was covered in 163 newspapers, 21 Television channels, 04 Radio channels and 206 online portal and media platforms, taking the total count to 394. Total 'Reach / Impressions' in social media including Facebook, Twitter, Instagram, YouTube and LinkedIn together has touched the figure of 30,06,970. Number of 'Engagement received' (people commented, shared posts)/ Videos Viewed) is 3,60,296. Apart from 360 social media posts, couple of Social Media Influencer Activities that has further enhanced the visibility of GSI. GSI gained 14,188 new followers across all social media platforms. GSI launched a Mobile App in August 2020, under the initiative of "Digital India Campaign" for public use. The App has so far achieved 5K+ downloads with 4.5 /5.0 rating. All in all, the public relation and media management has helped GSI to reach the masses in a faster and more effective manner.

For the upcoming period (1st January – 31st March 2021), the PRM Cell intends to further amplify the publicity campaign on GSI activities and achievements by doing about 90 social media posts, one Influencer activity, creating 5-6 interesting videos around the activities of GSI, as well as issue 4 Press Releases, 18 story generations, organize 9 interviews with subject experts on relevant topics pertaining

to the works of GSI and organize media workshops to train the subject experts and the field going officers on the traditional art of negotiation with the media to further enhance the visibility of Geological Survey of India.

UNCOVER (India) Projects

6.33 Two pilot scale projects were taken up by Geological Survey of India involving Geology and Geophysics team of officers from Western, Southern and Central Regions teams as a follow-up of National Mineral Exploration Policy (NMEP) 2016.

6.34 Project 1: Searching for concealed and deep-seated mineral deposits below unclassified sediments in parts of Aravalli and Bundelkhand Cratons in parts of Rajasthan, Madhya Pradesh and Uttar Pradesh.

About 620 km transect starts from, close to Churu in Rajasthan to the northwest and continues up to Tikamgarh in Madhya Pradesh to the southeast to bring out the possible concealed and deep-seated mineral systems by interpreting response of surface and subsurface geophysical data and its integration with other Geoscientific data.

6.35 A detailed ground geophysical work in sand covered terrain of Churu-Jhunjhunu and Dausa-Bandikui sector has been completed based on geochemical and geophysical signatures. Buried topography of sand covered portions of Rajasthan part (nearly 15, 000 sq. km) has been prepared by using about 2300 number of bore-well logs amounting more than 1,80,000 m collected from various government agencies like Central and State Groundwater Boards Government and fieldwork by the UNCOVER (India) team. A first-hand geological map of buried terrain

has been achieved based on the potential field data with multi-geoscience approach. New metasedimentary sequences and meta igneous bodies with significant pyrrhotite and minor pyrite concentration were established with four boreholes in the Churu sector having a transported cover of thickness varying from 80 to 100m thickness. Indications of having polymetallic sulphide mineral system cannot be ruled out since elevated lead & zinc values is associated with minor chalcopyrite combined with some grains of lead-sulphide, REE phases and few gold grains as analysed in microprobe analysis. The first hand predictive geological map of buried terrain is a first-step to increase the chance of concealed mineralization in the country. Concentrated efforts to minimise the risk of mineral deposit discovery under this project in potentially covered terrain is under progress.

6.36 Project 2: Deep Crustal Mapping across Western and Eastern Dharwar Cratons for searching concealed and deep-seated mineral deposits, in parts of Andhra Pradesh and Karnataka.

About 560 km transect initiates close to Dharwar type area starting from Karnataka to Nellore in Andhra Pradesh. The transect encompasses geologically Eastern, Western Dharwar Craton, and Cuddapah basin. From west to east, this transect includes the wellknown Gadag auriferous schist belt, Bellary-Hospet iron ore belt, Wajrakarur kimberlite province, and base metal mineralization in the Cuddapah basin.

Integrated geophysical analysis and geochemical data show high gravity anomalous zones in the South of the Sandur sector in covered greenfield areas. This reveals the possibility of the hidden schist belt. This anomaly needs to be tested by subsurface exploration techniques like drilling for searching for concealed schist belt which might contain mineralization. Integrated geology and ground geophysical survey brought out a gravity anomalous zone in the Gooty area in the Eastern Dharwar craton. It reveals the presence of mafic-ultramafic intrusions in a partly covered area. A few PGM grains were also recognized from these mafic intrusions under Electron Microprobe Analysis. Few grains of gold were identified in quartz veins in the Gadag area under Scanning Electron Microprobe.

Indian Bureau of Mines (IBM)

6.37 The Mineral Policy Conference held in January 1947 resulted in the enactment of the Mines and Minerals (Regulation and Development) Act, 1948, the first legal framework in independent India for the regulation and development of mines. The Mines and Mineral (Regulation and Development) Act, 1948 received the assent of the Governor General on 8th September 1948. The Act empowered the Central Government to regulate mines and oilfields and mineral development on the lines contemplated in the Industrial Policy Resolution of the 6th of April 1948. The deliberations of the conference led to the establishment of the Indian Bureau of Mines in March 1948 as the main regulatory agency for monitoring and supervising mining activity in the country.

6.38 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

Ministry of Mines

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.

6.39 It undertakes scientific, techno-economic, research-oriented studies in various aspects of mining, geological studies, ore beneficiation and environmental studies.

6.40 Vision for IBM

The National Mineral Policy, 2019 (NMP) has envisioned on strenathenina the regulatory mechanism by incorporating e-governance, including satellite and remote sensing applications, evaluations of miners in terms of their comparative performance on suitable development framework and enforce commitment on part of the mining companies to adopt sustainable development. Accordingly, the vision envisaged is: "IBM to perform as a National technical regulator and to discharge the developmental functions for the sustainable development of the mineral industry and to work as repository of database on mines and minerals"

6.41 Mission

- 1. To ensure effective regulation of Indian Mineral Sector which promotes long term benefits for its sustainable growth.
- To provide capacity building to State regulatory agencies and also to provide quality technical assistance to the mineral industry, and
- 3. To work as data bank on mines and minerals and to disseminate mineral information for policy formulations.

6.42 Objectives

- To work as National Technical Regulator operating at national-level designing systems, processes and guidelines for regulation of the mining sector;
- (ii) To function as a facilitator for creation and improvement of state-level regulatory mechanisms and to facilitate state agencies to ensure adherence to standards and parameters for scientific and systematic mining in the sector;
- (iii) Towork as catalytic agent for development of mineral sector by evolving capability & proficiency in beneficiation techniques; dissemination of knowledge and skills in mining and allied areas through its training facilities; consultancy services.
- (iv) To play crucial role of that of an Advisor to the Government in matters and issues relating to the mineral sector in areas of short-medium and long-term mineralwise strategies, mineral taxation and legislative processes.
- (v) To play the role of National Repository of mineral data through maintaining a data bank of mines and minerals in the country by developing advanced IT based Mineral Information System enabling the industry to report and access information online, and
- (vi) To broaden its interactive base and reach out to overseas counter parts through consultations and exchange programmes and to build capacity, skill & expertise through academic and training programmes at institutes of international repute.

6.43 Present Charter of Functions

In the wake of liberalization of the policy regime governing mineral sector and increasing need for adequate environment management as part of systematic and scientific mining, the mandated functions for IBM, as given for notification in Official Gazette vide Resolution No. 31/49/2014 – M. III, dated 3rd November, 2014. Charters of functions of IBM are available at

https://ibm.gov.in/index.php?c=pages&m= index&id=65&mid=23870



6.44 Key Activities and Functions of IBM

In light of the role and charter of IBM, the key functions being performed by IBM can be broadly classified as (i) Regulatory Functions, and (ii) Developmental Functions. The same are available at:

https://ibm.gov.in/writereaddata/files/ 06232020153619Functions%20and%20 activities%20Indian%20Bureau%20 of%20Mines.pdf



Organizational set up of IBM

6.45 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.

6.46 IBM has modern mineral processing laboratory and pilot plant at Nagpur and well-equipped Regional Mineral Processing Laboratories and pilot plants at Ajmer, Bengaluru.

6.47 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 subgrade ores and analysis of environmental samples;
- Scheme No. 3. Technological Upgradation and modernization;
- Scheme No. 4. Collection, processing, dissemination of data on mines and minerals through various publications
- Scheme No. 5. Mining Tenements System (under implementation)

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

- Minerals Development & Regulation (i) Division (MDRD);
- Mineral Processing Division (MPD); (ii)
- Technical Consultancy, Mining Research (iii) and Publication Division;
- (iv) Mineral Economics Division;
- (v) Mining and Mineral Statistics Division; and
- Planning and Coordination Division. (vi)

Performance relating to various regulatory and development functions of IBM during the year 2020 (up to December 2020) is given hereinafter. The same is also enclosed at Annexure 6.3.

6.49 Inspection of Mines

During the year 2020 (January to December), 956 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, 1199 violations were pointed out to 587 mines during 2020 (January to December) as against 1798 violations (pointed out to 746 mines) in the year 2019. Total 422 violations were rectified during the year. So far, for the reporting period, 26 cases (including cases launched in previous years also) were decided in favour of IBM as against 28 in the year 2019. Mining operations were suspended under Rule 11(2) of MCDR 2017 in 56 mines for not carrying out mining operations in accordance with the approved mining plan/ review of mining plan and IBM recommended 55 cases for suspension of leases to State Government for non-submission of online returns/ discrepancies in submitted returns. A list of principal violations observed during inspection of mines for the year 2019 and 2020 are given at **Table 6.2.** Inspection of Mines carried out by IBM during the year 2020 is given in **Table 6.3**.

Table 6.2
Principal Violations of MCDR, 2017 detected by IBM during 2019 and 2020

Rule Number and description	No. of violations pointed out in 2019	No. of violations pointed out in2020 (Jan. to Dec. 2020)
Rule11 (1) - Mining operations in accordance with mining plans	376	300
Rule 11 (3) - Submission of Review of Mining Plan / Scheme of mining	03	02
Rule 20 - Notice of opening of mine	08	03
Rule 23 - Submission of progressive mine closure plan	02	01
Rule 26 (2) - Responsibility of the holder of mining lease to submit yearly report	121	164
Rule 27(2) - Submission of Financial assurance	15	06
Rule 28 (1) - Notice of temporary discontinuance of mining operations	16	14
Rule 31(4) - Maintenance of plans and sections	25	25
Rule 33 - Copies of plans and sections to	51	68
Protection of Environment: Rules 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.	162	107
Rule 45 (5) (b) - Submission of Monthly Return	38	44
Rule 45 (5) (b) - Submission of Monthly Return	38	07
Rule 45 (5)(c) - Submission of Annual Return	124	49
Rule 55(1)(c)(i) - Employment of Whole time Mining Engineer/Geologist	78	32
Rule 55(1)(c)(ii) - Employment of Part time Mining Engineer/Geologist	19	40
Others	722	337
Total	1798	1199

Table 6.3

Inspection of Mines carried out by IBM during 2020 (Jan. to December, 2020)

S.No.	State	No. of inspection		
1	Andhra Pradesh	99		
2	Assam	5		
3	Bihar	1		
4	Chhattisgarh	47		
5	Goa	28		
6	Gujarat	74		
7	Haryana	0		
8	Himachal Pradesh	22		
9	J & K	0		
10	Jharkhand	58		
11	Karnataka	113		
12	Kerala	5		
13	Madhya Pradesh	115		
14	Maharashtra	63		
15	Manipur	1		
16	Meghalaya	22		
17	Odisha	134		
18	Punjab	0		
19	Rajasthan	60		
20	Sikkim	0		
21	Tamil Nadu	76		
22	Telangana	22		
23	Uttarakhand	10		
24	Uttar Pradesh	1		
25	West Bengal	0		
Total		956		

Mining Plan, Review of Mining and Mine Closure Plan

6.50 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) nonmetallic 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 Review of Mining Plan 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 & rehabilitation of land and control on ground vibration, surface subsidence and restoration of flora.

6.51 Till the year 2020 (January to December), Financial Bank Guarantees for a value of Rs.22,64,12,24,314/- i.e., Rs.2264.122 crores [as per revised per hectare rate of Rule 27(1) of MCDR, 2017] have been collected.

6.52 During the year 2020 (January to December, 2020), 55 mining plans were approved and 20 not approved; 190 review of Mining Plan were approved and 42 not approved; and 15 final mine closure plans approved and 7 were not approved. Statewise break-up is given at **Table 6.4**.

Table 6.4

State-wise Mining Plans/Review of Mining Plans/Final Mine Closure Plans approved by IBM during the year 2020 (January to December)

c		Mining	g Plans	Review of Mining Plan		FMCP	
No	State	Approved	Not Approved	Approved	Not Approved	Approved	Not Approved
1.	Assam	0	0	0	0	0	0
2.	AP	0	1	18	15	1	1
3.	Jharkhand	3	0	19	3	0	0
4.	Bihar	0	0	0	0	0	0
5.	Chhattisgarh	1	0	19	1	1	0
6.	Delhi	0	0	0	0	0	0
7.	Goa	0	0	0	0	0	0
8.	Gujarat	0	1	27	0	1	0
9.	Himachal	0	1	3	0	2	1
10.	Haryana	0	0	0	0	0	0
11.	J & K	0	0	0	1	0	0
12.	Karnataka	0	0	13	3	3	1
13.	Kerala	0	0	0	0	0	0
14.	MP	15	2	31	0	1	0
15.	Maharashtra	14	2	18	3	2	0
16.	Meghalaya	4	5	2	9	0	1
17.	Manipur	0	2	0	0	0	0
18.	Odisha	18	5	36	5	3	3
19.	Rajasthan	0	0	0	0	1	0
20.	Sikkim	0	0	0	0	0	0
21.	Tamil Nadu	0	0	0	0	0	0
22.	Telangana	0	1	4	1	0	0
23.	Uttar Pradesh	0	0	0	0	0	0
24.	Uttarakhand	0	0	0	1	0	0
25.	West Bengal	0	0	0	0	0	0
	Total	55	20	190	42	15	7

6.53 No reconnaissance permits have been granted during the year 2020. The details of reconnaissance permits granted till 31.12.2020 is given in **Table 6.5**.

	Table 6.5
Status	of Reconnaissance Permits in India
	(as on 31 st December 2020)

S. No.	State	Total No. of RPs	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

6.54 Status of prospecting licences (major & minor) as on 31.12.2020 is given in **Table 6.6**.

Table 6.6 Status of Prospecting Licences (major & minor) in India (as on 31st December 2020)

S. No.	State	Total No. of PLs granted by the State Government as on 31.12.2020	No. of PLs where final exploration data submitted to IBM*
1	Andhra Pradesh	93	38
2	Arunachal Pradesh	17	01
3	Chhattisgarh	152	84
4	Gujarat	18	01
5	Himachal Pradesh	07	04
6	Jammu & Kashmir	01	00
7	Jharkhand	28	05
8	Karnataka	10	06
9	Kerala	01	00
10	Madhya Pradesh	563	158
11	Maharashtra	48	09
12	Manipur	17	01
13	Meghalaya	16	04
14	Odisha	16	06
15	Rajasthan	234	12
16	Tamil Nadu	18	00
17	Telangana	44	12
18	Uttarakhand	44	00
19	Uttar Pradesh	03	00
20	West Bengal	03	00
	Total	1.333	341

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

Preparation of Mineral Maps

6.55 Geographic Information System and Remote Sensing Centre has been established in Indian Bureau of Mines, which is functional since December, 2018. Multi Mineral Lease hold maps are now updated on Arc GIS platform. Up to 31st December 2020, vectorisation of 474 topo-sheets and plotting of 3410 mining leases is completed out of 3903 mining leases. Plotting of 493 leases is under progress. Preparation of attribute tables of all leases for Goa, Maharashtra, Andhra Pradesh, Gujarat, Karnataka, Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, Kerala, Rajasthan, Tamil Nadu, Bihar, Haryana, Himachal Pradesh, Jammu & Kashmir, North Eastern States, Uttarakhand, West Bengal and Telangana states are completed. Preparation for geology layers for corresponding states from Bhukosh data base of GSI is completed. All the maps viz lease boundaries, geology layer and toposheet layer have been integrated for the States of Goa and Maharashtra

Mineral Beneficiation

6.56 Mineral beneficiation studies including mineralogical testing and chemical analysis intimately relates to both conservation and development of mineral resources. During the year 2020 (up to 31st December 2020), 44 ore dressing investigations, 14,793 chemical analysis, 2,217 mineralogical examinations and 01 in-plant study were completed. The all-India iron ore deposits for carrying out Ore Dressing Investigations are broadly classified into following five zones for the better understanding of state-wise iron ore processing. The Ore Dressing Division has carried out investigations on Iron Ore in all the zones, details of which are available at following web link:

https://ibm.gov.in/index. php?c=pages&m=index&id=232



Beneficiation studies of Mineral deposits set for auction

6.57 As per the amended Act, all exploration reports need to be made UNFC (2009) compliant before auctioning of mineral blocks, for which mineral beneficiation study is an important aspect. The exploration indicates only the geological aspect. Beneficiation study indicates the viability of the block for commercial operations in view of feasibility and economics. Thus, beneficiation study has paramount and crucial role for the development of mineral deposits in India.

6.58 Since the year 2016, IBM has been carrying out laboratory scale beneficiation studies on all G2 Level of exploration samples of GSI and MECL. Till date studies on total 85 nos.G2 Level samples of GSI and 6nos. G2/G1 level sample of MECL have been completed by IBM and reports were submitted. Out of which 07 mineral blocks comprising gold ore, graphite, copper and iron ores have been successfully auctioned. About 06 (six) more blocks are ready for auctioning and remaining blocks are under preparation.

National Mineral Inventory (NMI) as on 01.04.2020

6.59 Quinquennial updating of NMI as on 01.04.2020 for 46 major minerals has been initiated. Correspondence to various exploration agencies i.e. Central Government (MECL, GSI, etc.) and various State & Central PSU's were made to elicit information for updation of NMI as on 01.04.2020. In this connection an All-India Conference on NMI 2020 was successfully organized on 23rd January, 2020 with participation from various

exploration agencies of the country. Further, a Workshop-cum-Training Programme on NMI as on 01.04.2020 was conducted during 17th-18th February, 2020 through Training Center, IBM for in-house officers of IBM. Cumulatively 2532 NMI data sheets of Private Leasehold deposits updated during the year 2020-21 up to December 2020. Simultaneously, the processing, generation of output and preparation of comparative statement for finalization of NMI as on 01.04.2020 in respect of 01 mineral is completed and 03 minerals are under progress. Finalisation and generation of summary output of another 19 minerals will be completed during January to March 2021. The NMI is based on UNFC system which is being used for making decisions of investments 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

6.60 IBM disseminates statistical information on mines, minerals, metals and mineralbased 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.

6.61 The statistical publications released during the year 2020 (up to December 2020) include Statistical Profiles of Minerals 2018-

19, Monthly Statistics of Mineral Production (MSMP) up to Feb. 2020. Further, Indian Mineral Industry at a Glance 2016-17 (final release) and 2017-18 issue completed and hoisted on website. Issue of 2018-19 is under progress. MSMP issue of March, 2020 is under progress.

Consultancy Service

6.62 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. During the year 2020, 01 Regional Mineral Development study was taken up. Report for effective utilization of iron ore fine dump of NMDC, Bailadila was prepared and is under review by the Competent Authority.

6.63 In 2021, RMDS for effective utilization of Iron Ore fine dumps (as available) in M/s SAIL, Bhilai and Rajhara sector (Chhattisgarh) will be taken up.

Technical Publications

6.64 IBM brings out technical publications relating to mines and minerals, mineral-based industries, trades, beneficiation, R&D activities, etc. Indian Mineral Year Book (**IMYB**) is a flagship publication of IBM in three (3) volumes. It consists of Part I having as many as 11 General Chapters, Part II consists of 18 Reviews on metals and alloys and Part III consists of 30 mineral reviews. This publication covers information on minerals and mineral-based commodities, their development, production, resources/reserves, consumption, trade and policy. It also includes world scenario. IMYB

provides a status report of Mining and Mineral Industry in India on an annual basis. This publication has wide readership-both National and International.

For IMYB, 2019 (data 2018-19), total 57 general/metals & alloys/mineral reviews were prepared, technically edited, finalized and sent to Press after consolidation of all chapters with the statistical data. The IMYB, 2018 (Final Release) was uploaded on IBM's portal.

6.65 For IMYB, 2020 (data 2019-20) about 10,625 letters/questionnaires/e-mails were issued for capturing of data. Nearly 1103 (including Form O, N and guestionnaires) receipts from various mineral-based industries, Central/State Government departments, Central/State Undertakings. National Laboratories etc. were received during the period under review.

6.66 Preparation of IMYB 2020 was taken up for three separate volumes, viz. Volume-I for General Reviews, Volume-II for Metals & Alloys and Volume-III for Mineral Reviews. Preparation of reviews is under progress

6.67 Half yearly Bulletins on mineral information (October 2019 to March 2020) and yearly Bulletin on Mining Lease and Prospecting Licenses 2019 are released.

(i) Bulletins on Mineral information (BMI) (October 2019 to March 2020) is available at https://ibm.gov.in/writereaddata/ files/08052020151817BMI oct2019_mar2020.pdf



Bulletin on Mining Lease and Prospecting (ii) Licenses 2019 is available at

> https://ibm.gov.in/writereaddata/file s/11122020115739BULLETIN_2019 pdf

Training

6.68 IBM is discharging its roles and responsibilities through a mandated charter of functions. In the wake of recent policy initiatives and statutory amendments, IBM needs to enhance its skills in various advanced technologies for mine regulation and development.

Method envisaged for carrying out Training

6.69 The training imparted to IBM personnel is of 2 to 3 days which is being held at Headquarter and its regional offices as well as at two skill development centres located at Udaipur and Kolkata. Nominations are sought in advance. After approval of Competent Authority, training programme is organized through Classroom lectures / presentation by the faculties drawn from IBM as well as Industry. In last couple of years, IBM personnel had attended training programme in outside organizations / institutes like GSI, National Remote Sensing Centre, ASCI, etc. Accordingly, further training programme, wherever necessary, will be conducted in association with these organizations / institutions. Further, through bilateral cooperation with other Countries, capacity building programme will be taken up.

Skills for which Training required for other stakeholders connected to IBM are:

6.70 Implementation of provisions of MMDR Amendment Act, 2015 and subordinate legislation framed there under: preparation of Mining Plan/Mining Scheme, including Mine Closure Plan, Mine Reclamation and Rehabilitation: Sustainable Development Framework and Star Rating System for Mines; Mining Surveillance System; Mineral Resources as per United Nations Framework Classification (UNFC); Technological improvements and innovative advances in the areas of mineral processing and beneficiation.

6.71 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. 5 online training programmes were conducted in the backdrop of COVID Pandemic during the year 2020-21 (up to January, 2021) in which a total of 187 IBM personnel participated. Upto March, 2021 a total of 8 training programmes are expected to be conducted by Training Centre. IBM has imparted training and capacity building programmes to 982 numbers of its own employees and 788 numbers of industry personnel and State Government officers during the years 2017-18 to 2020-2021 (up to January 2021). IBM makes its presence in the meetings as organized by GSI/ MECL for its active participation, towards synergic approach. Further, 22 officers of IBM have participated in an e-training programme on Remote Sensing and GIS applications conducted by GSITI from 01.06.2020 to 13.06.2020. Besides, two officers from IBM attended e-training programme on GIS and Remote sensing application organized by RTI, GSI WR Jaipur from 19.10.2020 to 23.10.2020. Also, 8 officials of IBM attended two days' training programme on "Preventive Vigilance" from 8 to 9 Dec. 2020 conducted by MECL under IBM MECL Synergy.

6.72 IBM has initiated efforts to upload its training modules on iGOT platform. IBM has also identified and prepared the power point presentations of its lectures on different subject topics as enshrined under its charter of functions by various faculty members of IBM. Efforts are being made for their videography/

audiography, so as to upload them on IGOT platform. Total 25 numbers of lectures are identified under 06 modules. The work is under progress.

6.73 Bhuvisamvad activity was initiated by IBM in technical/engineering institutions, colleges, polytechnics and university departments on pan India basis. The instructions and guidelines to IBM field offices had been sent vide letter dated 24.12.2019 for its implementation. During the period i.e. from January 2020 to March 2020, a total four programmes were conducted under this activity one each at Chennai, Nagpur, Raipur, Udaipur, wherein 500 students participate from engineering colleges, university PG departments. Industry persons have also attended these programmes. The broadtopical domain of the sessions are Role & Responsibilities of Indian Bureau of Mines. Mining Policies and Regulatory framework, Sustainable Development Framework in Indian mining sector and Advanced Techniques in mineral characterization & chemical analysis and mineral beneficiation vis-r-vis facilities available in mineral processing laboratories and pilot plant in IBM and carrier perspectives in mining sector.

Measures for Abatement of Pollution and Environmental Protection

6.74 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 is 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.

Revenue Generation

6.75 IBM generates revenue through processing of mining plans/ review of mining plans, compounding fees & fines, consultancy, training, statutory processing and sale of publications & data etc. Revenue generated during the year 2020 (January to December 2020) is Rs. 358.44 Lakh.

Computerization

6.76 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.

6.77 The Web Portal of IBM i.e. https:// 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 https://mitra.ibm.gov.in/ Pages/returns.aspx is also functional for facilitating the stakeholders to submit the monthly & annual returns online and also scrutiny of the same by IBM. Further, the bilingual website of IBM is being updated as and when required.

6.78 After introduction of online submission of returns system consequent to the amendments 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 6.7.**

Table 6.7 Month-wise Returns Submitted online (up to December, 2020)

SI. No.	Month	No. of monthly returns received online
1	January, 2020	2219
2	February, 2020	2196
3	March, 2020	2170
4	April, 2020	2125
5	May, 2020	2115
6	June, 2020	2098
7	July, 2020	2061
8	August, 2020	2018
9	September, 2020	1980
10	October, 2020	1896
11	November, 2020	1499

6.79 Mineral Wise Summary of Mining Lease Distribution of Minerals (excluding Atomic, Fuel & Minor Minerals) as on 31.03.2019(P) (All India) is given in <u>Annexure 6.4</u>.

Mining Tenement System (MTS)

6.80 Mining Tenement System (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.

Sustainable Framework

Development

6.81 Star Rating System: The Star Rating System is a good governance initiative, designed as a tool for mapping of mining footprints from the view point of Sustainability. The Star Ratings is being awarded, based on evaluation of performance of mines on technological, socio-economic and environmental parameters, giving objective reporting of their activities. It has been instituted as a two-tier system providing self-evaluation templates to be filled in by the mine operator followed by validation through Indian Bureau of Mines. The Star

Rating scheme is designed to have an inbuilt compliance mechanism for environment and forest safeguards and has been helpful in recognizing good performers in the sector while encouraging all mining lease holders to strive for excellence. The Star rating has been mandated by Rule 35 of Mineral Conservation and Development Rules (**MCDR**), 2017.

6.82 All the mine operators are mandated to achieve at least three-star ratings within a stipulated time period of four 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.

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

- 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.

6.84 Based on evaluation of the performance of lease operators on the various parameters encompassed by the Principals of the Sustainable Development Framework (**SDF**), validation of self-assessed templates was carried out by IBM and accordingly rating was given as 0 to 5. The year wise 5 Star rated mines are given below:

Year	5 Star Rated mines
2014-15	9
2015-16	32
2016-17	57
2017-18	57*
2018-19	52*

*Recommended for awards

6.85 The mine operators were felicitated for achieving 5-star rating at National Conclave on Mines and Minerals held at Raipur, Delhi and Delhi on 4th – 5th July, 2016 (for the year 2014-15), 15th February, 2017 (for the year 2015-16) and 20th March, 2018 (for the year 2016-17) respectively. For the year 2017-18 and 2018-19, award function is yet to be organized.

6.86 During the year 2020-21 (till 31st December 2020) so far, 792 online templates for the performance of year 2019-20 have been filed by the lessees. Field verification of these leases for final evaluation is under progress and so far in 72 leases field verification has been completed.

Mining Surveillance System

6.87 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. The details are given in para 3.18 under chapter 3 of this report.

Committee for Review and Restructuring of the Functions and Role of IBM

6.88 Ministry of Mines constituted a Committee vide its Resolution No. 16 (27) / 2009-M. VI dated 23.07.2009 for the Review and Re-structuring of the Functions and Roles of Indian Bureau of Mines in terms of the policy directions given in the National Mineral Policy and the Mines and Minerals (Development and Regulation) Act and Rules framed there under.

6.89 The Committee submitted its Report to the Government of India on 04 05 2012 suggesting for overall restructuring of the IBM. It recommended the creation of 933 posts in addition to the existing strength of 1477. Ministry of Mines reviewed the recommendations of the Committee in the wake of significant changes in the legislative framework by the Government. Ministry optimized the proposal without considering increase in sanctioned strength. The proposal was examined in consultation with the Department of Expenditure, Ministry of Finance. The proposal was finalized with the creation, abolition and up-gradation of posts under various disciplines of IBM keeping the expenditure revenue neutral by way of matching saving through surrender of 180

Group 'A' (level 10) alive posts of Geological Survey of India, an Attached Office of Ministry of Mines.

6.90 The Department of Expenditure accorded approval to the proposal and suggested that the posts to be surrendered will be done gradually as and when the incumbents retire on superannuation or otherwise or are promoted. The Cabinet approval was also accorded in consonance with the Department of Expenditure instructions vide OM No. 7(I)/E. Coord-I/2017 dated 12.04.2017 for creation/ upgradation/ abolition of posts of the level of Joint Secretary and above. Accordingly, the detailed discipline-wise, revised sanctioned strength of IBM is published on 15th May, 2018 vide notification no. 31/72/2009-M.III.Vol.I (part–I), which can be accessed at the following web link:

https://ibm.gov.in/writereaddata/files/060 82018125338Restructuring_notification_ dated%20170518.pdf

6.91 Consequent to the Gazette notification, the following actions have been undertaken:

i) Office Orders issued regarding redesignation pertaining to the post merged, merged & upgraded etc. in accordance with the notification.

- ii) Internal Committee has been constituted in IBM under the chairmanship of CCOM in charge for implementation of restructuring for deciding re-deployment of man power and amending codified duties in respect of employees of IBM.
- iii) Recruitment Rules in respect of various disciplines had been uploaded in the IBM's website for inviting stakeholders' comments and then finalized after incorporating comments. Revised RRs for Mineral Economics, Library, Rajbhasha, Stores, Administration, Stenographer, Drawing, Geology, Mining & Publication Discipline have been notified. Remaining RRs are at various stages of finalization.

Human Resources

6.92 The total sanctioned personnel strength of IBM is 1477. The present filled-in strength is 732 as on December, 2020. The cadre-wise employment position in IBM as on December 2020 is given in **Table 6.8**.

	Conctioned	Total No. of	Number of Personnel						
Group	strength	employees in position	sc	ST	OBC	Minorities	Women	Physically Handicapped	
А	459	128	16	08	32	10	04	00	
В	502	291	36	14	41	10	53	06	
С	516	313	65	20	55	16	35	06	
Total	1,477	732	117	42	128	36	92	12	

Table 6.8Employment of Personnel in IBM as on December, 2020

<u>Central Public Sector</u> <u>Undertakings</u>

89

Central Public Sector Undertakings

Ministry of Mines

Central Public Sector Undertakings

•	Nati	onal Aluminium Company Limited	Page	- 91
	0	Existing Operations & their Locations	Page	- 91
•	Hind	dustan Copper Limited	Page -	110
	0	Copper industry in India	Page -	116
•	Min	eral Exploration Corporation Limited	Page -	120
•	Bha	rat Gold Mines Limited (BGML)	Page -	133

Annual Report 2020-21

National Aluminium Company Limited (NALCO)

Introduction

7.1 National Aluminium Company Limited (NALCO) is a 'Group A' Navratna CPSE under Ministry of Mines. The Company is an integrated and diversified mining, metal and power CPSE with sales turnover of Rs.8,426 crore in financial year 2019-20 and export sales (i.e. Rs.3,511 crore) accounted about 42% of turnover. The Company has business in more than 15 countries. The Company is 2nd highest net foreign exchange earning CPSE in the year 2018-19. Presently, Government of India holds 51.5% equity of NALCO. To see more details, visit:

https://nalcoindia.com/investor-services/ annual-reports/



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



Photo -7.1: NALCO Corporate Office, Bhubaneswar

7.3 The Company is the lowest cost producer of Alumina & Bauxite in the world as per Wood Mackenzie Report.

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'89. The Company is listed at Bombay Stock Exchange (BSE) since 1992 and at National Stock Exchange (NSE) since 1999. Besides, ISO 9001:2015, ISO 14001:2015, OHSAS 18001:2007/ ISO 45001 & SA 8000:2014 certification; the Company has also adopted 50001:2011 for energy ISO standards management system& ISO 27001:2013 security infrastructure, applications and users.

7.5 The Company has diversified to renewable energy sector by commissioning 198 MW wind power plant in four different places in Andhra Pradesh, Rajasthan (2 locations) and Maharashtra to reduce carbon foot print. Moving ahead, the Company has also utilised the available roof top space in Corporate Office, Township and NALCO Research & Technology Centre (**NRTC**) at Bhubaneswar and Alumina Refinery, Damanjodi for setting up of 670-kilowatt peak (kWp) solar power plant.

Existing Operations & their Locations

Bauxite Mines

7.6 The Company has its fully mechanised open cast Bauxite Mines which is one of the most sophisticated and eco-friendly mining operations to be found worldwide, situated on Panchpatmali plateau in Damanjodi, Koraput, in the State of Odisha. North & Central blocks of Panchpatmali mine is being presently operated at 100% capacity i.e. 6.825 million tonne per annum. Bauxite production from new mine i.e. South block of Panchpatmali Mines started at 4th quarter of FY 2017-18 with leased capacity of 3.15 million tonne per annum. The mined-out bauxite is transported from the Mine to Refinery by a 14.6-km. long

single-flight, multi-curve, variable-speed cable belt conveyor of 1800 TPH capacity.



Photo -7.2: Panchpatmali mine

Alumina Refinery

7.7 The Alumina Refinery is located at Damanjodi, Odisha, approximately 14 km. from the Bauxite Mines 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.

7.8 The present normative capacity of Alumina Refinery is 21 lakh tonne per annum. 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 i.e. 5% of the total sale is also sold in domestic market.



Photo -7.3 : Aluminium Smelter, Angul

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/road for export. Aluminium in the forms of ingots, sow ingots, tee ingots, billets, wire rods, alloy ingots, flat products and chequered sheets are also sold in the domestic market through its stockyards located across the country. During FY 2019-20, the domestic sales are as follows:

ltem	Sales (FY 19-20)				
Standard Ingot	1.41 Lakh Tonne				
Sow Ingot	0.30 Lakh Tonne				
T-Ingot	0.42 Lakh Tonne				
Billet	0.23 Lakh Tonne				
Wire Rod	0.86 Lakh Tonne				
Rolled Product	0.17 Lakh Tonne				

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

7.12 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 turbogenerators, 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. NALCO's captive power is meant for captive use of Smelter. It also meets partly power requirements of the Refinery.



Photo -7.4 Captive Power Plant

Wind Power Plants

7.13 The 1st wind power plant of capacity 50.4 MW in Gandikota, Andhra Pradesh was commissioned in Dec' 12 and the 2nd wind power plant of capacity 47.6 MW at Ludarva site, in Jaisalmer, Rajasthan were commissioned in January, 2014. 3rd wind power plant of capacity 50 MW at Devikot site, Jaisalmer, Rajasthan and a 50.4 MW Wind Power Plant at Sangli, Maharashtra commissioned in September, 2016 & December, 2016 respectively.



Photo -7.5 : Wind Power Plant, Jaisalmer

Rooftop Solar System

7.14 NALCO utilised the entire available roof top space in Corporate Office, Township and NRTC at Bhubaneswar and Alumina Refinery, Damanjodi for setting up of 670-kilowatt peak (kWp) solar power plant.



Photo 7.6: Roof Top Solar facility

Port Facilities

7.15 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.



Photo 7.7 : Port Facility, Vizag

Performance of NALCO

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

Product	Unit	2016-17 Actual	2017-18 Actual	2018-19 Actual	2019-20 Actual	2020-21 Target	2020-21 (Actual up to Dec. 2020)	2020-21 (Expected achievement)
Bauxite	Lakh tonne	68.25	70.25	72.31	73.02	71.51	53.48	73.00
Alumina Hydrate	Lakh tonne	21.00	21.06	21.53	21.61	21.10	15.07	20.71
Aluminium Metal	Lakh tonne	3.87	4.26	4.40	4.18	4.18	3.06	4.10
Net power	Million Units	6,066	6,547	6,256	6,067	6,549	4,757	6,407
Wind Power	Million Units	198	243	330	312	314	243	288

Table 7.1: Physical Performance of NALCO

Table 7.2: Financial Performance of NALCO

(In Rs. crore								
SI. No.	Particulars	2016-17 Actual	2017-18 Actual	2018-19 Actual	2019-20 Actual	2020-21 Actual up to Sep' 2020	2020-21 Expected achievement	
1.	Income *	7,964	9,789	11,825	8,744	3,813		
2.	Operating Cost**	6,516	7,268	8,607	7,983	3,351	Shall be	
3.	Interest & Transaction Loss	3	2	2	6	4	submitted after Annual	
4.	Depreciation & Amortization	480	480	476	530	279	Audit 2020-21	
5.	Profit before Income tax and Dividend	965	2,039	2,740	226	180		

* Income and expenditure are net of excise duty on sales

** Operating cost includes exceptional items

Sales	Unit	2016-17 Actual	2017-18 Actual	2018-19 Actual	2019-20 Actual	2020-21 Target	2020-21 Actual up to December 2020	2020-21 Expected achievement
Total Alumina/ Hydrate Sale	Lakh Tonne	12.95	13.37	13.18	13.04	12.93	8.49	12.90
Aluminium Export	Lakh Tonne	1.01	0.76	0.39	0.57	1.95	1.46	2.00
Domestic Aluminium Sale	Lakh Tonne	2.85	3.50	4.02	3.39	2.38	1.66	2.30
Total Aluminium Sale	Lakh Tonne	3.86	4.26	4.41	3.96	4.33	3.12	4.30

Table 7.3: Sales Performance of NALCO

Ongoing Projects

7.17 The major activities during FY 2020-21 (till December '20) pertaining to various projects of NALCO are as under:

- 5th Stream Refinery: All the statutory a) clearances were obtained for brown field expansion of Refinery. Technology licensor and Engineering, Procurement, Construction Management (EPCM) consultant appointed basic and package deliverables engineering submitted by the Technology provider. Work for boundary wall which was disrupted for more than 2 years, has resumed in the last week of June '19 after amicable settlement with the villagers with the support of district authorities. Presently the boundary wall construction work is in progress. Award of work for various project packages are under various stages of tendering & evaluation. So far, 12 nos. of orders (out of total 33 packages) have been placed.
- b) **Development of Pottangi Mines:** Process initiated for obtaining FC & EC for the Forest Land of Overland conveyor corridor. Forest Diversion Proposal (FDP)

is under process. FRA certificate issuance by the Collector is being pursued. Observations of Collector, Koraput on the issuance of FRA certificate are being complied. Consent to Establish (CTE) application submitted to OSPCB on 27.08.2020. Team of OSPCB has inspected the Pottangi Mines on 05.11.2020 with regards to issuance of CTE of Pottangi Mines. Observations of MoEF&CC, Gol on the EC application is being complied. Forest diversion proposal recommended by DFO, Koraput.

- c) Bauxite Transportation System from South Block of Panchpatmali Mines: EC amendment received. Packaging philosophy finalised. Crusher Package was awarded. Other packages are under various stages of finalisation.
- d) Utkal D Coal Mines: Government of Odisha has granted Mining lease to Utkal-D coal mines over an area of 301.28 hectares (ha). Mutation of total land of Rehabilitation and Resettlement (R & R) Colony completed and Physical possession taken over by NALCO. EC has been transferred in favour of NALCO by MoEF&CC, GOI on 11.08.2020. DGPS

survey of Utkal-D lease boundary has been taken by ORSAC (Odisha Space Application Centre).Consent to Establish was issued by OSPCB on 27.11.2020 in favour of NALCO. Stage – II FC for 137.02 Ha of Forest Land of Utkal D obtained, EC accorded, Stage – II FC of Forest land of 6.5 Ha Safety Zone in process.

- e) **Utkal E Coal Mines:** Mining plan approved, Land acquisition in process (468 Acres registered out of total private land of 545 Acres), EC available, Obtaining FC under process.
- JV with GACL for setting up of f) 2.7 Lakhs TPA caustic soda plant in Gujarat: NALCO has formed a JV Company with GACL named "GACL-NALCO Alkalies & Chemicals Private Ltd. (GNAL)" to set up a 2.7 lakh TPA Caustic Soda Plant along with 130 MW Captive Power Plant at Dahej in Gujarat with an objective of raw-material security and to reduce import dependency by around 1,00,000 tonnes / annum. Land for the project has been transferred in favour of GNAL. Environmental clearance for the project has been obtained. Financial closure completed. The project is expected to be completed by May, 2021 as per the inputs provided by JV Company.
- g) Angul Aluminium Park in JV with IDCO: NALCO has formed a JV Company with Odisha Industrial Infrastructure Development Corporation (IDCO) for establishment of Angul Aluminium Park Private Ltd. (AAPPL) for promotion of downstream industries to manufacture Conductors, Extrusions, Castings, Foils & other aluminium products. NALCO to

facilitate by supplying primary metal i.e. aluminium. Land acquisition completed. Construction of boundary wall and approach road has been completed. Development of internal infrastructure is in progress.

- h) Aluminium alloy manufacturing plant in JV with MIDHANI: NALCO has constituted a Joint Venture Company named Utkarsha Aluminium Dhatu Nigam Limited (UADNL) with Mishra Dhatu Nigam Ltd. (MIDHANI) in Aug'19 for establishment of High End Aluminium Alloy Plant for use in Defence, Aerospace and Automobile sectors reducing import dependency for such alloys and encourage Make in India. Government of Andhra Pradesh has allotted 110 acres of land for the project. Construction of boundary wall completed. Further plans and actions & timeline are being developed by the JV Company.
- i) Acquisition of Strategic minerals in overseas (KABIL): JV Company among NALCO, HCL and MECL named Khanij Bidesh India Limited (KABIL) formed on 8th Aug'19 to identify, acquire, develop, process and make commercial use of strategic minerals in overseas locations for supply in India and thus boost "Make in India" initiative of Government of India. Consultant M/s DMT Consultancy completed study for acquisition of the shortlisted 12 strategic minerals. Actions taken by the KABIL are at paras 5.14 onwards of Chapter 5 of this report.
- j) Aluminium Downstream projects: The Company has prepared Detailed Project Report (DPR) for establishment of Aluminium Downstream Projects in
Kamakhya Nagar block of Dhenkanal district of Odisha. NALCO has deposited Rs 1.35 cr to IDCO in Dec, 2020 for allocation of 83.34 acre of land. The DPR has been revised considering reduced land for the project.

- k) Brownfield Expansion of Smelter (Capacity: 0.5 million TPA): Detailed Project Report (DPR) for the project has been prepared. Rs. 107 crore released to IDCO for land acquisition. The Company is exploring options for sourcing power at affordable price to make the project economically feasible.
- I) Greenfield Smelter and Captive Power Plant in JV with MCL: NALCO and MCL are exploring the possibility of formation of a Joint Venture Company (JVC) for establishment of a 0.5 MTPA Greenfield Aluminium Smelter Plant and 1400 MW Captive Power Plant on the land identified by MCL in Basundhara coalfield. MoU between NALCO and MCL signed.
- m) Rooftop solar power project at Port Facility, Vizag: NALCO has placed order on the developer in August, 2020 for implementation of 100 kWp grid connected rooftop solar project at NALCO's Port Facility at Vizag.
- Alloy Wire Rod Plant: Setting up of manufacturing facility of capacity 40,000 TPA alloy wire rod or 60,000 TPA EC grade wire rod at its Smelter Plant in Angul. Financial analysis with revised estimate is under process.
- Commercialization of Li-Ion cell technology: NALCO is exploring for production of Lithium-Ion cell / battery. NALCO has signed a Memorandum of

Agreement (**MoA**) with ISRO in April, 19 for transfer of technology. NALCO officials participated in the technology awareness program arranged by ISRO. Signing of MOU with IIT-Kharagpur for their technical assistance for setting up a prototype plant based on lithium-ion cell technology is being considered. IIT-Kharagpur has submitted a revised estimate budget which is under examination. Besides, possibility of partnership between NALCO and BHEL for business partnership in Li-ion cell manufacturing is being explored

Information Technology

7.18 Information Technology (**IT**) is being leveraged effectively by NALCO to create a positive impact on efficiency, quality and safety.

7.19 NALCO has implemented Enterprise Resource Planning (ERP) application to integrate all the business functions such as sales & 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 is carried out through Supplier Relationship Management (SAP-SRM), central public procurement portal and GeM portal. Centralized employee applications such as payroll, attendance, and income tax have been implemented. Online employee's self-service applications like leave, loans, perquisites, tour, medical reimbursements, probation confirmation, and appraisal and employee exit processing systems have been provided. Hospital Management System has been implemented for the Company hospitals at Angul and Damanjodi. A portal for contract Labour has been deployed to facilitate Contractors to manage their contract workers attendance, their payments and statutory returns.

7.20 For governance and monitoring, online web-based applications such as capital expenditure monitoring, fund monitoring, compliance management system, file tracking system, bill tracking system etc. have been implemented. The software are built in-line with company's requirements and linked to ERP. The list of software are:

- i. Capital expenditure monitoring system software
- ii. Fund monitoring system software
- iii. Compliance management system software
- iv. File tracking system software
- v. Bill tracking system software

These have resulted in timely monitoring and efficient management of capital expenditure, cash flow, statutory compliances and capital proposals. Bill tracking enables vendors to track their payments online.

Further, the following actions have been taken by NALCO for integration of processes through intervention of technology:

- i. NALCO e-Invoice generation and integration with IRN portal completed. e-Invoice and way bills generated from 01.10.2020.
- ii. NALCO has seamlessly integrated SAP with the GeM portal.
- iii. Host-to-Host integration has been done for NALCO and SBI for automatic payments/ receipts and reconciliation process thereof.

7.21 Implementation of E-Office solution: e-Office (Lite), developed by NIC, has been introduced at Corporate office *w.e.f.* 14.08.2020 and rolled out across all Plants and Regional Offices by 15.09.2020. 4183 e-Files created till 31.12.2020.

For secure and ready access to digitized documents, the e-office Knowledge Management System has been implemented. This system enables a secure and controlled environment for sharing of documents.

7.22 Adding to the array of existing Mobile Apps for stakeholders:

a. The following have been released.

"Suraksha" – A mobile App for onsite safety inspection reporting at plants. Around 138 users are utilizing the App.

- A third *language* option, Odia, is being introduced for "NISARG" (NALCO Initiatives for Social Awareness and Responsible Growth), a vibrant App for Citizens at large on NALCO CSR activities. A total of about 51 users have registered.
- ii. Enhancement of SoS feature in Retired Employees mobile App "Hamesha NALCOnian". About 1318 retired employees are using the App.
- iii. Enhancement to customer mobile APP "NAGINAA" (NALCO Grahak Information and Networking App for All) to include information related to chemicals manufactured by NALCO. About 900 Customers are using the App.

The following are planned to be launched/ enhanced by Q4 of FY 2020-21:

- "Navin"- A bi-lingual mobile App for Vendors. The App empowers vendors with required information about vendor registration process, major items procured through LTE basis, notifications on tenders, vendor meets etc.
- ii. Mobile App for Employee information viewing.
- iii. Mobile App for township maintenance management.

7.23 Nalco has the following IT infrastructure in place:

- In house tier-2 Data Center at Corporate Office Bhubaneswar, and website colocated at STPI Bhubaneswar. Data Center uses virtualized server environment, and houses about 110 Virtual Servers.
- ii. Plants and Offices are inter connected with two MPLS circuits (upto 100 Mbps) from two different service providers for uninterrupted access to applications and services from Corporate Data Center as well as the Internet. Corp Data Center has 200 Mbps of internet service from 2 Internet Service Providers.
- iii. Each location has Gigabit Ethernet LAN with Firewall and the Corp Data Center has additional gateway protection solutions.
- iv. Disaster Recovery Data Center at Damanjodi.

Action is underway to migrate NALCO website on to Government Cloud infrastructure with WAF protection.

7.24 To provide the senior management with ready insights into company's performance,

dynamic visualization dashboards have been introduced as below:

- Sales & Distribution Sales analysis
- Human Resource Manpower analysis
- Production-Daily and monthly production and raw material stocks
- Materials Procurement value analysis

7.25 The In-House state-of-the-art Data Centre and the Disaster Recovery site have been certified as ISO 27001:2013 compliant. The scope covers the full arena of IT Security for IT infrastructure, Applications and Users. IT infrastructure and application security are ensured with network gateway and endpoint security solutions. Implementation effectiveness is further assured with application and security audits. NALCO IS COMPLIANT TO THE CYBER SECURITY GUIDELINES OF GOVERNMENT OF INDIA.

Action Taken on Pollution Control and Environment

7.26 As a responsible corporate entity, NALCO is pioneer in 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 (ISO14001:2015) as well as Occupational Health and Safety Management Systems (OHSAS 18001:2007/ ISO 45001:2018). All Productions units are running with Valid Consents, licenses, authorizations under different statutes.

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 publishes a sustainable development report every year aligned with the international Global Reporting Initiatives (GRI) Standards.

7.28 For developing awareness on environmental issues, NALCO imparts internal as well external training to its employees as well as contractor workers on pollution control measures and on prevention of pollution. NALCO encourages active participation of its employees in environmental functions like Earth Day, World Environment Day, Vanamahotsav, Chemical Disaster Prevention Day, Ozone Day, National Pollution Prevention Day etc. To build awareness the company publishes bulletins, newsletter and annual Sustainability Report https://nalcoindia. com/sustainability/sustainable-developmentreports/].

The unit Specific major improvements taken up in the field of environment management at different units of NALCO during the year 2020-21 are:

a) Bauxite Mines:

- 1,10,231 nos. of trees were planted in and around Mines against the target of 1,00,000. Further, 5550 nos. of fruit bearing seedlings were distributed to local villagers to improve awareness about plantation among the villagers.
- 5,000 square meters of grass-turfing was carried out inside the Mines as per the target.
- Three nos. of continuous ambient air quality monitoring stations were established at the Central & North

Block and South Block Mines to enable online monitoring of ambient air quality. Air quality is being monitored in and around Mines once in a month at 15 locations. Particulate Matter below 10 & 2.5 micrometre are measured and maintained within the norm.

b) Refinery Plant

- Unit #2 Boiler ESP (Electro Static Precipitator) revamping completed and additional pass-C installed. Unit #4 Boiler ESP pass-A revamping work also is completed. Unit #4 pass-B revamping job along with Unit #1 and 3 revamping and additional pass installation jobs are in progress, Unit #1 and 3. Completion date is 31.12.2022.
- Fuel additive with HFO (Heavy Fuel Oil) at Calciners and hydrate dewatering agent in hydrate filtration are being used for getting lower specific oil consumption norm and thus leaving out lesser impact on GHG (Green House Gas) emission.
- Sewerage Treatment Plant (STP-III) revamping /technological up gradation work is completed, and tendering work for the same is in progress for STP-IV. Bio-additive (Microbial dosing) action is continuing for STP-IV in order to consistently comply with the revised norm of STP.
- Water from Ash Pond and Red-mud Pond is recycled for pulp making and percentage of reclamation is more than 100%.
- Used filter cloth (Plastic wastes) generated from plant is being disposed to coprocessing cement plant authorized by Central Pollution Control Board (**CPCB**).

- Discarded asbestos (hazardous waste) is being disposed to Common Hazardous Waste Treatment, Storage & Disposal Facility (CHWTSDF) at Sukinda, Jajpur.
- Three rain water harvesting facilities having 6,000 cubic metre capacity are in use inside the plant premise, Jobs for another 03 nos. of rain Water Harvesting units at township is in progress to be ready by April 2021.
- During 2020-21, total 18,785 saplings have been planted.
- Alumina Refinery received 1st position in 16th CII-EHS award competition conducted in Dec.2020.

c) Smelter Plant:

- As a part of good Hazardous Waste Management:
 - 7650 MT of Carbon Area hazardous waste disposed from Jan 2020 to Dec. 2020 to party authorised by Odisha State Pollution Control Board (**OSPCB**).
 - 3066 MT of dross disposed from Jan 2020 to Dec. 2020 to party authorised by OSPCB.
 - 726 MT of carbon portion of spent pot lining disposed till Dec. 2020 to party authorised by OSPCB.
 - 183 MT of refractory portion of spent pot lining disposed till Dec.
 2020 to party authorised by OSPCB.
- To monitor fugitive emission, online laserbased fluoride gas monitoring systems project is being undertaken to install at pot lines 1, 2, & 3. This monitoring system detects continuously fugitive fluoride levels inside the pot room, so

that instantaneous corrective action is taken.

- As a part of water recycling project, system for treatment and reuse of waste water near watch tower 23 is undertaken.
- To prevent water pollution & land contamination, to store Hazardous Waste securely, a new dross shed and a new spent pot line storage shed are constructed at Scrap & salvage area.

d) Captive Power Plant:

- Remote calibration facility for gaseous emission from Continuous Emission Monitoring Systems (CEMS) has been installed in all Unit-1 to 10 as prescribed by CPCB. Approval is awaited from CPCB for the performance check.
- Revamping of 1st 4 fields of ESP of Unit-5 has been carried out during annual overhauling in Dec. 2020 for improvement in stack emission.
- Zero discharge has been achieved with respect to industrial effluent, ash pond overflow water and sewerage treatment plant treated water which has been certified by State Pollution Control Board.
- The pumping capacity of Industrial Drain water recycling system has been increased from 400m3/Hr to 500m3/Hr to achieve zero discharge.
- During the FY 2020-21 (Up to December, 2020), 1,40,42,600 cubic metre of ash pond overflow water was recycled and re-used.
- During FY 2020-21(Up to December, 2020), 20,72,878 cubic metre of water from rain water harvesting system was recycled and re-used.

- Electro-chlorination system has been installed at STP in Dec. 2020 for up gradation of chemical dozing system for improvement in STP treated water quality.
- Construction of 3rd phase ash mound by increasing the height of Ash Pond-II from 107 to 111 MRL (Meter Reduced Level) has been completed. In this process 10.20 Lakh cubic metre ash has been utilized by evacuating ash from Ash Pond-I. Fourth phase ash mound work is in progress from 111 to 115 MRL.
- CPP, NALCO has implemented incentive scheme of Rs.150/MT to Brick manufacturer to enhance ash utilization. In the year 2020-21 (Up to December, 2020) around 4.50 lakh MT of dry ash has been supplied to Brick manufacturer.
- In the year 2020-21 (Up to December, 2020) around 3.77 lakh MT of pond Ash has been supplied to NH for road construction. Further follow up is being done with National highway & State high way to enhance utilization of Pond ash in upcoming project for using in road and flyover construction.
- A long-term agreement has been made with M/s Shree Cement, Athgarh for supply of pond ash/fly ash.
- Seepage water recycle system of 300 m 3/ hr recycle capacity has been constructed at Ash pond to re-use the seepage water in ash handling system.
- CPP Nalco has planted 5000 Nos. of plant in the year 2020-21.So far, plantation of around 12.21 lakhs plants is done since its inception covering around 35.42% of total area.

- Upgradation of Exit Point Recycle System (equipped with settling pit & 2 × 200 m3/hr submersible pumps) has been commissioned in Dec. 2020 to achieve zero discharge with respect of storm water & surface run-off outside CPP boundary.
- During FY 2020-21 (up to December, 2020) the ash utilization is 15, 60,961 MT which is 72.23% of total ash generated in this period.

Energy Conservation

7.29 NALCO is having Energy Management System in its Production Units Refinery, Smelter & CPP and certified to International Standards on Energy Management System (ISO 50001). Unit wise specific energy conservation majors taken up during FY 2020-21 are as follows:

a) Mines

- Phase wise replacement of conventional light with equivalent LED luminaire for the entire Mines, has been completed in the month of July 2020. Projected net savings for the project is 1.275 MU.
- On-Grid roof top PV solar power plant with 130 KWp (2 x 35 Kwp + 2 x 30 KWp) capacity is under installation stage over 04 nos. of buildings. The same is being executed by M/s Orissa Renewable Energy Development Agency (**OREDA**). The plant is having an energy generation capability of 0.211 MU.
- A lean six sigma project has been undertaken for reduction in energy consumption in illumination along the Mine haulage roads. The project is in analyse phase after trial implementation of the unique solutions. The project has

a potential of energy saving upto 0.32 MU.

• Provision for new Parking Lot is being made near active Mining faces so as to reduce HSD consumption by reducing movement between active Mining faces to existing parking near SMCP, which is currently nearly 1.5 kms away. The same shall allow parking of light mast trucks & track mounted vehicles closer to active Mine faces. This has a potential of saving more than 10 KL of HSD per annum.

b) Alumina Refinery

- Improved grinding efficiency in Ball Mill-004 by upgradation of grinding media from hyper steel to Hi-chrome.
- Enhanced insulation & repositioning of Resistance Temperature Detector (RTDs) in digestion tanks for optimizing steam consumption.
- Improved steam economy in Evaporators by replacement of old Cooling Tower with a new RCC Cooling Tower & replacement of safety vent valves in batteries G&H.
- Major overhauling of old compressors for improved efficiency.
- Alumina handling fluidization fan running logic modification to optimize running hours.
- Replacement of air-preheater heating element in Boilers.
- Continued use of Dewatering Aid in hydrate washing & filtration area, and HFO additive in Calciners.
- Replacement of 4300 numbers of conventional light fittings for area lighting by suitable LED fittings.

• Replacement of 20 numbers of old and multiple rewound motors by energy efficient IE2/IE3 class LT motors.

c) Smelter

- Graphitization of cathode to reduce specific DC energy consumption in pot line, saving @ 55kwh/MT of hot metal.
 846 pots have been graphitized till December, 2020.
- Smelter has taken up a pilot project i.e. "Development of low energy cell technology for Smelter plant (AP2XN)" with an objective to reduce specific energy consumption under the development cooperation agreement between Rio Tinto/ Alcan, Canada and NALCO. Fifteen pots in pot line -3 are under trial.
- Installation of Anode Slot cutting Machine at Rodding Shop –II, to reduce specific Dc energy consumption in pot line, saving@140 kwh/MT of hot metal, which is under erection stage.
- Energy Saving device in breaker assembly has been incorporated in 03 pots on trial basis with an objective to reduce consumption of compressed air, which is under erection stage.

d) Captive Power Plant:

- Replacement of nine old less efficient reciprocating air Compressors was carried out with new energy efficient Screw Compressors.
- Complete Renovation & Modification of existing of Air Pre-heater in Unit-6 was done with advanced profile higher heating surface & double sealing Air Pre-heater. This has resulted in increase in boiler efficiency due to reduction in

air leakage and increased heat transfer. Estimated coal saving per annum is 7640 MT.

- The following conventional light fitting have been replaced with Light Emitting Diode (LED) fittings.
 - (i) 5104 nos. 40Watt fluorescent Tube Light replaced with 20Watt LED Tube Light.
 - (ii) 3465 nos.70Watt HPSV well glass fittings replaced with 40Watt LED well glass fitting.
 - (iii) 432 nos. 250Watt HPSV/MH street light fitting replaced with 100Watt LED street light fitting.
 - (iv) 200 nos. 400Watt HPSV high bay light fitting replaced with 160Watt LED high bay light fitting.
 - (v) 176 nos. 2x400Watt HPSV tower light fitting replaced with 300Watt LED flood light fitting.

Total energy saving for the FY 2020-21 till 31st Dec. 2020 by replacing the above light fitting is 1116201.27 kWh.

Research & Development (R&D)

7.30 Since inception 39 patents have been filed out of which 20 have been granted and 7 have been commercialized. One patent application was granted in the current financial year which was filed earlier. Research & Scientific Advisory Committee (**RSAC**) meetings are being held periodically to review the R&D activities of the company.

 Under the Development Cooperation Agreement signed with RTA/ AP development of low energy cell technology for smelter plant (AP2XN) is going on with an objective to reduce specific energy consumption in Smelter Plant. After procurement and receipt of lining material, trial in 15 pots has been taken. At present 13 first generation AP2×N0 Pots are in operation. Data generated is being monitored and pots are under observation.

- NALCO in its pursuit towards organizational growth through sustained development in process, product and technology has started research & development activity in its new R&D Centre named as "NALCO Research and Technology Center" (NRTC) at Gothapatana, Bhubaneswar with stateof-the-art research and development facility, to achieve excellence in the fields of Bauxite, Alumina, Aluminium, Power and allied areas of research including down streams at national and international levels, progressively.
- NRTC is equipped with all advance technology-based equipment like QEMSCAN, XRD, XRF, ICP-MS, UTM, DSC, TGA, ICP-OES etc. The testing activities at NRTC have been started from 2019 on regular basis. R&D wing of NALCO Research and Technology Center has been recognized by DSIR, Government of India on 29.05.2020. Various samples from Mines, Refinery & Smelter plant are being carried out as per the requirement of plant. Testing of outside samples on chargeable basis is going on and detail information of testing services is available at NALCO website (www.nalcoindia. com).
- During this year around 2650 numbers of Pre-Production drill bauxite samples

from Mines, 60 numbers of Plant feed bauxites, 890 numbers metal samples from smelter plant and other samples related to plant have been tested. Samples from outside parties are being carried out on receipt of samples.

- Development of Integrated model through Sys CAD software has been completed for all four phases at Alumina Refinery which also covers unit operation like Washing circuit, Evaporation circuit etc.
- Collaborative R&D project is going on with CSIRO, Australia for extraction of alumina from Partially Lateritized Khondalite (PLK) through nitric acid route. Process parameter will be optimized of the developed process and techno economics of the developed process will be established.
- Inline fully automated anode butt monitoring system in collaboration with JNARDDC, Nagpur has been successfully installed and commissioned at Rodding shop 2, Carbon Area of Smelter Plant which may be helpful in improving anode fabrication process, calculation of net carbon consumption, anode cycle optimization and improvement of electrolytic cell performance.
- Wi-Fi enabled sensor arrangement has been developed in collaboration with JNARDDC, Nagpur for the online measurement of anode current distribution of aluminium electrolysis cell which would provide better understanding of cell phenomenon and thereby enhancing cell efficiency.
- Few basic research studies on Aluminum Composite were also completed with IIT

BBSR to determine the impact of addition of graphene in aluminium metal on its end properties for various applications e.g. solar heaters, batteries etc.

- Benefits Derived as a Result of the R&D (In-House & Collaborative): Based on a completed collaborative R&D project in 2020-21, following are the expected benefits
 - (i) Use of integral model of Bayer circuit through SysCAD software would help in further optimization of process parameters.
 - (ii) Dataobtained from inline automated butt monitoring system would help in further improvement in anode fabrication process, minimization of bath contamination, calculation of net carbon consumption & anode cycle optimization,
 - (iii) Online Wi-Fi enabled sensor arrangement would provide vital information on pot parameters for individual pots which will help in enhancing the cell current efficiency.

Development of low energy cell technology – AP2XN0 would help in reduction of DC Energy in pot lines of Smelter Plant.

Procurement

7.31 Against mandatory target of 25% procurement from MSMEs, NALCO has achieved 20.22% for the FY 2020-21 till December 2020 (against 31.08% in FY 2019-20).

7.32 Total procurement by the Company from MSEs for the FY 2020-21 till December, 2020, including SC/ ST MSEs & women owned MSEs,

is Rs.217.55 crore (against Rs.484.51 crore in FY 2019-20) out of which procurement from SC/ST MSEs is Rs.3.19 crore (against Rs.13.77crore in FY 2019-20) & women owned MSEs is Rs.9.87crore (against Rs.3.50 crore in FY 2019-20).

7.33 Total procurement by the Company through GeM portal is Rs.18.46 crore in FY 2020-21 till December, 2020 (against Rs.8.42crore in FY 2019-20).

7.34 Total 18 nos. of reverse auction done in FY 2020-21 till December, 2020 (against 28 nos. in FY 2019-20) and notional cost reduction due to reverse auction is Rs.11.07 crore (against Rs.92.32 crore in FY 2019-20).

Industrial Relations

7.35 During FY 2020-21, the COVID - 19 pandemic posed to be a major challenge in maintaining morale of employees and a conducive Industrial Relations situation. However, regular HR interventions and continuous engagement with various employee unions and associations ensured sustained business activities of the company during the entire period. In spite of nationwide lockdown to prevent the spread of COVID 19 pandemic all units were functioning with reduced manpower as per instructions from Government of India and State Governments. Various steps were taken for sanitization of work places including providing masks and sanitizers to protect the employees from infection. Introduction of staggered working hours as per Government guidelines was smoothly implemented across the organization. Zero tolerance to indiscipline and worker's participation in management remained strongly rooted in the work culture. There is zero man-days loss due to IR issues during FY 2020-21 till date.

7.36 MoU rating of NALCO during the last Five Financial years

Year	Year Composite Score			
2014-15	1.258	Excellent		
2015-16	91.19%	Excellent		
2016-17	88.48%	Very Good		
2017-18	91.88%	Excellent		
2018-19	96.04%	Excellent		

Aluminium Industry in India

7.37 The Indian primary Aluminium industry consists of three major players i.e. National Aluminium Company Limited (NALCO), Hindalco Industries and Vedanta Ltd., having a total production capacity of 4.1 million tonne. The total production of Primary Aluminium metal during FY 2019-20 was about 3.62 million tonnes and in FY 20-21, it is expected to shrink slightly to 3.56 million tonnes. During 2019-20, the total domestic sales of primary metal by the major primary producers, i.e., NALCO, Hindalco and Vedanta was 1.55 million tonnes, which is likely to shrink to 1.33 million tonnes during the current fiscal, as per current trend.

7.38 The Aluminium per capita consumption level in India continues to be very low i.e. it stands currently at around 2.9 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, major aluminium industries consuming are automobiles, machinery packaging, & 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, has a superior weight to strength ratio, is resistant to corrosion, has better formability etc.

7.40 During the FY 2020-21, the global economy has witnessed extreme turbulence. The spread of Covid-19 pandemic globally has kept Aluminium demand subdued and prices depressed, especially during the months of April to June 2020. Many countries-imposed lockdowns to contain spread of the virus. As a result, industrial activities were stalled and supply chains across the world got disrupted. Although Covid-related curbs have since been relaxed, global Aluminium consumption is likely to register lesser consumption during FY 2020-21 as compared to previous year.

7.41 The domestic Aluminium industry was severely hit by the pandemic. The nation-wide lockdown during March to May 2020 brought

the entire domestic industry to a standstill. As domestic demand declined sharply, all primary Aluminium producers ended up with large volumes of unsold inventory. In order to sustain production, Aluminium producers were compelled to explore overseas markets and book large export volumes for liquidating their metal stock. Subsequently, upon gradual easing of Covid-related restrictions, metal demand in the domestic market started to recover, and the prices also exhibited an upward trend. However, the uptick in demand is not likely to fully compensate for the sluggish demand observed during April-June 2020, and domestic consumption for FY 2020-21 is likely to be lower than that of previous year.

7.42 The total domestic production of Aluminium metal by Aluminium producers in the year 2016-17 to 2020-21 (till December, 2020) is given at **Table 7.4**.

SI. No.	Producer	2017-18	2018-19	2019-20	2020-21 (up to Dec. 2020)
1	NALCO	4,25,515	4,40,242	4,18,373	3,06,276
2	Hindalco	12,88,351	12,96,468	13,12,541	9,14,755
3	Vedanta Group	16,69,741	19,58,422	18,87,965	14,39,214
	Total	33,83,607	36,95,132	36,18,879	26,60,245

Table 7.4 Production of Aluminium in India

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

7.43 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

					(i igs: iii ioiiiie)
SI. No.	Producer	2017-18	2018-19	2019-20	2020-21 (up to Dec. 2020)
1	NALCO	3,50,469	4,02,134	3,38,864	1,66,406
2	Hindalco	6,40,617	6,36,120	5,84,937	3,15,324
3	Vedanta Group	6,71,946	6,15,910	6,24,601	4,46,131
	Total	16,63,032	16,54,164	15,48,402	9,27,861

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

(Figs. in Tonne)

(Figs in Tonne)

Table 7.6: Export Sales of Aluminium

(Figs. in Tonne)

SI. No.	Producer	2017-18	2018-19	2019-20	2020-21 (up to Dec. 2020)
1	NALCO	75,847	38,463	56,898	1,45,983
2	Hindalco	6,49,986	6,58,935	7,06,567	6,13,913
3	Vedanta Group	9,98,522	13,40,201	12,41,276	10,04,210
	Total	17,24,355	20,37,599	20,04,741	17,64,106

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

7.44 Trends of Production & Sales Parameters

Production:







Sales:



7.45 Awards & Accolades during FY 2020-21

The Company for its stellar performance has been recognized by various reputed institutions. Some of those are:

- In recognition of Excellence in CSR activities, NALCO has been conferred with the prestigious PSE Excellence Award, organised by the Indian Chamber of Commerce during the 10th Public Sector Agenda Meet held online on 14.10.2020.
- (ii) NALCO Research & Technology Centre has been recognized as R&D Centre by Department of Science & Industrial Research (DSIR), Government of India in July 2020.
- (iii) Alumina Refinery conferred with CII-EXIM Bank Platinum recognition for Business Excellence. Panchpatmali Mine & Smelter Plant awarded in Gold Plus category.

Hindustan Copper Limited (HCL)

Introduction:

7.46 Hindustan Copper Limited (HCL), a Miniratna Category-I, Government of India 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 Government 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 ARCIL [Asset Reconstruction Company (India) Limited] in 2015-16 and renamed as GCP (Gujarat Copper Project). 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.

7.47 Highlights of achievements in Financial Year 2020 – 21

- Mining Lease agreement of Khetri & Kolihan Copper Mines at Khetri Copper Complex (KCC), Rajasthan extended for next 20 years w.e.f. from 1st April 2020; Malanjkh and Copper project (MCP) at Malanjkhand, Madhya Pradesh extended till 27.08.2023; Kendadih Mines & Rakha Mines, Indian Copper complex (ICC) at Jharkhand extended till 02.06.2023.
- ii) HCL has signed long term agreement with M/s Hindalco on 17.09.2020 for sale of its almost 60% copper concentrate which will fetch much better and consistent realisation and will boost Atma Nirbhar Bharat Abhiyan.
- iii) On 23.11.2020, MCP underground expansion project has achieved one of the biggest milestones i.e. connecting north and south section of mine at



Photo 7.8: MCP underground expansion project has achieved one of the biggest milestones i.e. connecting north and south section of mine at 240 Mrl

240mRL a 1500 m long drive had been excavated to make the tunnel ends meet. With completion of expansion project, the rated capacity of MCP will be 5.00 million tonnes per annum. The mine will be one of the largest underground copper mine in India.

- iv) The Company provisioned for 34 beds to isolate Coronavirus patients at its Unit Hospitals in Indian Copper Complex (ICC) in Jharkhand, Malanjkhand Copper Project (MCP) in Balaghat- Madhya Pradesh, Khetri Copper Complex (KCC) in Jhunjhunu - Rajasthan, with doctors, paramedics and other requisite facilities available 24×7. KCC has also provided one of its ambulances to the State Government for prevention and control of spread of Covid-19.
- v) Total 836.5 KWp Roof top solar plant implementation has been completed in HCL till date in FY 2020-2021 and further additional implementation of 4500 KWp solar plant at MCP & 1000 KWp solar plant at KCC through RESCO model is under progress.
- vi) Implementation of GST paid exports under which the company is getting refunds of GST on export of copper concentrate.
- vii) HCL has contributed the unspent CSR fund and one day salary of all employees to the Prime Minister's Citizen Assistance and Relief in Emergency Situations (PM CARES) Fund to help our country combat with Covid-19.



Photo 7.9: "COVID-19 Talks" at the mine

7.48 The capital structure of the Company as on 31st March, 2020 is given in **Table 7.7**.

Table 7.7: Authorized Capital Structure of HCL

a) Aı	uthorized Capital:						
i)	180 crore equity shares of Rs. 5/- each	Rs.900 crore					
ii)	20 lakh preference shares of Rs.1000/- each	Rs.200 crore					
	Total Rs.1,100 cros						
b) Is	b) Issued, Subscribed and Paid-Up Capital						
i)	92, 52, 18,000 equity shares of Rs. 5/- each	Rs.462. 609 crore					

7.49 Present capacities of HCL's Mines, Smelters and Wire Rod Plant are given in **Table 7.8**, **Table 7.9** and **Table7.10** respectively.

Table 7.8 : Production Capacity of Mines of HCL

(figures in million tonnes per annum)

Location of Mines	Ore Capacity (as per Mining Plan)
Khetri Copper Complex (KCC), Rajasthan	1.9
Malanjkhand Copper Project (MCP), Madhya Pradesh	2.9
Indian Copper Complex (ICC), Jharkhand	0.4
Total	5.2

Table 7.9: Refined Copper Production Capacity of HCL

(figures	in	Tonnes	per	annum)
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Location of Smelters	Refined Metal Capacity
Indian Copper Complex (ICC), Jharkhand	18,500
Gujarat Copper Project (GCP), Jhagadia	50,000*
Total	68,500

*The rated capacity as per record is 50,000 tonnes per annum however it was never operated at full capacity.

Table 7.10: Production Capacity of Wire Rod Plant of HCL

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

7.50 Physical performance details of HCL are given in Table 7.11.

Table 7.11: Physical Performance of HCL

Dreduct	Actual previous	for the s 2 years	Target	Actual from 1⁵t April,	Projection for the
Product	FY 2018-19	FY 2019-20	2020-21	2020 to 31 st December, 2020	period Jan-Mar'21
Ore Production ('000 Tonnes)	4122	3968	4300	2278	1075
Metal in Concentrate (MIC) (Tonnes)	32439	26502	34000	16659	7400
Refined Copper (Cathode) (Tonnes)	16215	5340	14500	Nil	Nil*
Wire rod (Tonnes)	21450	8443	13480	1160	Nil*

* As per the business plan of the Company, concentrate of MCP, KCC and ICC origin are being sold directly in the market and as a result, refined copper cathode and own wire rod production will be Nil.

Go through details on https://www.hindustancopper.com/Page/ProductionReport



7.51 Financial performance details of HCL are given in **Table 7.12**.

Table 7.12 Financial Performance of HCL

(Rs. in crore)

c		Actual previous	for the s 2 years	Target	For the Period April 2020 to	For the Period Octo-	
s. No.	Details	FY 2018-19	FY 2019-20	for FY 2020-21	September 2020 (Limited Review)	ber 2020 to March 2021 (Estimated)	
1.	Turnover	1753.44	803.17	1570.08	718.59	860.00	
2.	Net Profit/(Loss)before Tax (PBT)	230.00	(538.06)	47.12	21.13	(*)	
3.	Net Profit/(Loss) after tax (PAT)	145.51	(569.35)	30.65	38.59	(*)	

(*) HCL being a listed Company, price sensitive data cannot be disclosed unless the audited result is published.

Go through details on https://www.hindustancopper.com/Page/TenYearsataGlance

7.52 Sales performance details of HCL are given in Table 7.13.

Product	Actual for the previous 2 years		Target	Actual from April, 2020 to	Projection for	
riouuct	FY 2018-19	FY 2019-20	2020-21	December 2020 (Provisional)	Jan-Mar, 2021	
Total Copper Sales (MT)	38273	18408	35437	25005	6300	

Go through details of sales in volume and revenue on:

https://www.hindustancopper.com/Page/ SalesVolume



https://www.hindustancopper.com/Page/ SalesRevenue

7.53 MoU ratings achieved by HCL are given in **Table 7.14**.

Year	Grade
2010-2011	Very Good
2011-2012	Excellent
2012-2013	Very Good
2013-2014	Very Good

Tab	le 7	.14	

Year	Grade
2014-2015	Good
2015-2016	Very Good
2016-2017	Good
2017-2018	Fair
2018-2019	Very Good
2019-2020	Result awaited

Mine Expansion Schemes

7.54 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 significantly lower copper prices and also position it to remain a dominant copper player in the country.

7.55 The Company has plans to increase its mining capacity from current level of around 4.0 million tonnes per annum to 12.4 million tonnes per annum in phase–I (under implementation) and from 12.4 million tonnes per annum to 20.2 million tons per annum in phase-II through expansion of existing mines, re-opening of closed mines and opening of new mines. During financial year 2019-20, HCL has achieved ore production of 3.96 million tonnes.

7.56 HCL has been entrusted to do the exploration activities and exploration has already being taken up in various area. The surface exploration drilling in FY 2020-21 (till December) was NIL because of Covid-19 pandemic, however a tender for the same is under finalization.

7.57 Details of depth exploratory drilling in different mines of HCL for financial year 2019-20 is given in **Table 7.15**.

SI. No.	Mining Area	Exploration in FY 2019-20 (in meter)
1.	Ghatsila	14168
2.	Khetri	6298
	Total	20466

Table 7.15

- ii. Development method for analysis of Sodium iso Propyl Xanthate (SIPX) is under process.
- iii. Introduction of rice husk for mixing with ANFO (explosives) for Deep Hole Blasting (Production Blasting) at KCC has resulted in optimum size rock fragmentation, with no hang wall or roof top collapse. Moreover, blasting cost has been reduced by almost Rs. 4/- per ton.
- iv. Other in-house developmental activities:
 - a. Head shaft assembly of tertiary crusher has been modified in-house in Central Repair shop of MCP and put in operation successfully.
 - b. The in-house repair of imported item from China (Vacuum pump for Ceramic Filter) at MCP has been done under the mission of "AatmaNirbhar Bharat".

7.59 Energy Conservation

- Proposal for installation of 4500 KWp Ground based solar plant at MCP and 1000 KWp Ground based solar plant at KCC has been initiated under RESCO model.
- ii. The project for design, supply and installation of solar power plant of various capacities under RESCO model of MNRE has been carried out till date across HCL with the help of M/s REIL. Out of total 836.5 KWp solar plant implemented in HCL till date, 795 Kwp was carried out under RESCO model and remaining under CAPEX mode.
- iii. High wattage conventional lights replacement by low power consuming LED lights are in progress across HCL since

7.58 R&D Activities

Above exploration work was funded by HCL through its own

Due to Covid-19 pandemic situation there was no significant R&D projects, however following activities were carried out in FY 2020-21:

i. Line study of Mosabani concentrator plant at ICC has been done to improve the Concentrate quality and Optimize tail loss.

resources



Photos 7.10: Roof Top Solar Plant of 345.6 kwp installed at Malanjkhand Copper Project, Madhya Pradesh

last 6 years. 2500 nos. of LED lights are planned to be installed in year 2020-21. Till 2020-21 (31.12.20) HCL has installed 10330 nos. of LED lights out of which 600 Nos. of LED lights were installed during the period April-December 2020. This year HCL is expected to achieve the target by 31st March 2021.

iv. Several under-loaded transformers at KCC are switched off and shifted their loads on other transformers. The initiative enabled us to achieve improved power factor and power savings of approximately Rs. 10 lakhs in FY 2020-21.

7.60 Environment

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 environmentally sound manner as per the guidelines prescribed by the Pollution Control Boards. The following actions have been taken by the HCL in this regard:

- Safety zone plantation around Mining Lease boundary (Approx. area 0.5 hectare) through Madhya Pradesh Rajya Van Vikash Nigam Limited is done at MCP. Work is expected to be complete in FY 2020-21.
- ii. Khetri Copper Complex (KCC), in District Jhunjhnu, Rajasthan is located in a predominantly dusty and arid zone, with scarce vegetation and acute water shortage. KCC has adopted aggressive afforestation and water harvesting initiatives, to mitigate the adverse effects of surface soil loss and depletion of ground water.
- iii. Rain water during monsoons is coursed into the abandoned pit of Chandmari Open Cast Mine of KCC for storage and use during the dry months. This reduces our dependence on ground water resources to some extent.
- iv. Moreover, treatment of sewage water from the township at KCC generates approximately 500 cum. water per day, which is used for plant production, and

further reduces dependence on scarce ground water.

v. Online Emission Monitoring system for Stacks and Effluent monitoring system for CETP final treated discharge water has been installed at Indian Copper Complex (ICC), Ghatsila and data is being transmitted to CPCB in every 15 minutes.



Photo 7.11: Safety Zone Plantation at MCP

7.61 Information Technology Initiatives

The following major Information Technology (**IT**) initiatives, spanning all operational areas, were taken up by the Company for bringing about dynamism, transparency and business efficiency, which are being maintained and updated:

(i) Enterprise Resource Planning (ERP) implementation: Maintaining ERP (Oracle eBiz Suite R12.1.3) implementation has enabled HCL to adopt а 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.

- (ii) On-Line Performance Management System: On-Line Performance Management system implemented fullfledged to record the KPA, KPA Approval, ACR Marking up to two levels and final Scoring as per APAR up to the level of E-7.
- (iii) E-Procurement/EPS: Procurement of Stores & Spares items above Rs.2.0 lakh continues to be done through Enterprise Procurement System (EPS), conducted by third party namely National Informatics center (NIC). E-reverse auction for procurement of high value item is in place.
- (iv) 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.
- (v) On-line Recruitment: On-line recruitment module developed and is in operation at HCL. It is well-integrated with payment gateway to accept the online forms for recruitment. Through the module HCL can operate multiple online recruitment processes in parallel.
- (vi) VIDEO Conferencing: Video Conferencing implemented throughout HCL, to reduce the TA & DA bills against executive tours. Also, Executives facilitated to interact with external agencies from their place.

Copper Industry in India

7.62 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.

7.63 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.

7.64 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 (closure order issued to Vedanta Smelter/refinery plant by Tamil Nadu government in May'2018) have set up port-based smelting and refining plants.

7.65 Current year production of copper is given in **Table 7.16**.

				(in tonnes)
Cathode Production	Number of Factories	Installed Capacity (tonnes per annum)	Production during FY 2019-20	Production during the period (Jan'20 to Nov'20)
a) HCL	3	68,500	5,340	Nil
b) Sterlite Industries Ltd.	1	4,50,000	77,490	87,582 #
c) Hindalco Ind. Ltd. (Unit: Birla Copper)	1	5,00,000	3,25,568	2,23,858 #
Total	5	10,18,500	4,08,398	3,11,440

Table 7.16: Production of Copper in India

From Monthly Summary Reports on Non-Ferrous Minerals & Metals from Ministry of Mines website

Refined Copper Consumption

7.66 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, AtmaNirbhar Abhiyan and Make in India spells good news for copper industries. India's per capita copper consumption is 0.5 kg whereas for the world it is 3.2 kg hence there is a huge scope of increase in copper consumption in future.

7.67 According to ICSG (press release dated 20.12.2020), world apparent refined copper usage grew by 1.5% in the first nine months of 2020.

7.68 As per ICSG copper market forecast 2020/2021 dated 19.10.2020, apparent refined copper usage projected to grow by about 1.1% in 2021.

7.69 Sustained growth in copper demand is expected to continue because copper is essential to economic activity and even more so to the modern technological society. Infrastructure development in major countries

(in tenned)

such as China and India and the global trend towards cleaner energy will continue to support copper demand.

Reserves & Resources

7.70 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 tonnes with about 12.16 million tonnes of copper metal. Of these 207.77 million tonnes (13.74%) fall under Reserve category containing 2.73 million tonnes of copper metal and the balance 1303.73 million tonnes (86.25%) are 'Remaining Resources' containing 9.42 million tonnes of copper metal.

7.71 Reserves are deposits that have been discovered, evaluated and assessed to be economically profitable to mine. Resources are far bigger and include reserves, discovered deposits that are potentially profitable and undiscovered deposits that are predicted based on preliminary geological surveys.

7.72 Rajasthan is credited with 813.33 million tonnes ore (53.81%) containing 4.48 million tonnes of copper metal, Jharkhand 295.39 million tonnes ore (19.54%) containing 3.28 million tonnes of copper metal, Madhya Pradesh 283.43 million tonnes ore (18.75%) containing 3.42 million tonnes copper, 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 1.5% only. According to United States Geological Survey (USGS), total global copper reserves amount to 870 million tonnes (Mt) of copper (The World Copper Factbook 2020). The country wise distribution of world reserves is given in **Table 7.17**.

Table 7.17 : World copperreserves - Country-wise distribution

Country	Reserves in (%)
Chile	23
Australia	10
Peru	10
Russia	7
USA	6
Mexico	6
Indonesia	3
China	3
Kazakhstan	2
Zambia	2
Congo (Kinshasa)	2
Other	25

Source: Indian Minerals Yearbook 2019

World copper reserves and mine production is represented below (in terms of copper metal content):

2019 World Copper Reserves & Mine Production*



*Source: USGS (resources/reserves data) and ICSG (capacity/ production data)

7.73 According to the United States Geological Survey (USGS), copper reserves currently amount to around 870 million tonnes (Mt). Identified and undiscovered copper resources

are estimated at around 2,100 Mt and 3,500 Mt, respectively (Ref. The World Copper Factbook 2020, International Copper Study Group)

Reserves / Resources under HCL

7.74 As on April 1, 2020, HCL hold around two-fifths of the copper ore reserves in India, with an average of 1.01% copper content. HCL as on 1.4.2020 has reserves (proved & probable) of 167.08 million tonnes ore (average grade 1.32%) and total reserve and resources of 570.40 million tonnes ore (average grade 1.01%) spread over seven mining leases.

Price of Copper

7.75 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.

7.76 The year wise average LME price per tonne of copper is given in **Table 7.18**.

	(in 05 \$ per tonne)
Year	Average LME price of Copper
2010-2011	8140
2011-2012	8485
2012-2013	7855
2013-2014	7103
2014-2015	6554
2015-2016	5215
2016-2017	5154
2017-2018	6444
2018-2019	6340
2019-2020	5859
2020-2021 (Upto Dec' 20)	6345

Table 7.18:

(in US \$ per toppe)

7.77 Sustainable Development

HCL adheres to the sustainable development requirements as per the guidelines and policy of the Department of Public Enterprises. Following projects are implemented under sustainable development plan for the year 2020-21:

- i. Covering top soil & plantation at the waste rock dump at all three mining units of HCL.
- ii. Significant progress has been done towards implementation of roof top solar plant across the organization. Total 836.50 KWp solar plant implementation completed till date under RESCO & CAPEX model and further proposal is under finalization for Installation of additional 4500 KWp Ground based solar plant at MCP and 1000 KWp Ground based solar plant at KCC under RESCO model.
- iii. Water conservation by recycling of mine water.
- iv. Waste management initiatives including waste reduction.
 - a) The sale process of over-burden waste rock at MCP which has been accumulated during the course of open cast mining in last 40 years has been started after taking due approval from Govt. of Madhya Pradesh. This will be used as substitute of aggregate and hence will reduce the pollution load of the project.
 - b) New underground (u/g) mine at MCP which is under development below the existing open cast mines will have special features like backfilling of voids by using copper ore tailings



Photo: 7.12

(Known as paste fill technology). The test-work has been completed and basic engineering report is under preparation. The back-filling operation of u/g void will avoid the surface disposal of copper ore tailings reducing thereby the pollution load due to solid waste generated by the project.

c) Electronic waste, Spent Oil and Hazardous waste are disposed through parties authorized by Pollution Control Board.

Mineral Exploration Corporation Limited

7.78 Mineral Exploration Corporation Limited (**MECL**), a Miniratna Category-I CPSE under Ministry of Mines is the premier notified exploration agency in the country mandated to carry out detailed exploration of all the minerals. MECL undertakes detailed exploration on behalf of mineral rich States for various minerals through

National Mineral Exploration Trust (**NMET**) fund as well as contractual basis for other agencies including Public Sector, Private Sector and State Government(s) on mutually agreed terms and conditions. Percentage of share in revenue of Public Sector, NMET and State Governments are around 88%, 11% & 1% respectively. It has added 177 billion tonnes of mineral resources to National Mineral Inventory up to December, 2020.

7.79 The authorized share capital and paid-up equity of the company are Rs.125.00 crore andRs.119.55 crore respectively. The equity is fully held by Government of India. The Company's registered office and operational headquarter is at Nagpur, which includes modern geological, geophysical & geochemical laboratories, regional maintenance centre, etc. The pan India operation involving exploration of minerals at remote location are controlled and monitored from Nagpur. The details of office locations are available at www.

7.80 Since its inception, MECL has carried out detailed exploration under Promotional Scheme of Government of India for ferrous, non-ferrous, base metals precious, industrial and other minerals on behalf of Ministry of Mines and a total of 10.31 billion tonne of resources have been established. Details are available at www.mecl.co.in.

7.81 Pursuant to the Mines and Minerals (Development and Regulation) Amendment Act, 2015, and after establishment of NMET, MECL is taking up exploration work for State Governments through NMET.

7.82 MECL is also engaged in regional exploration of Coal & Lignite on behalf of Ministry of Coal. The exploration projects have been finalized by the Core Group of Committee on Energy Minerals and Resources, Group V of Central Geological Programming Board (**CGPB**). So far, a total of 56.35 billion tonne of Coal and 31.75 billion tonne of

Lignite resources have been established by MECL on behalf of Ministry of Coal.

7.83 On contractual basis, MECL undertake exploration for PSUs, State Governments, Private agencies etc. The CMPDIL is the major client of MECL for Coal exploration which is being done thorough MoU. For the year 2020-21, CMPDIL awarded around 4.50 lakh metres of exploratory drilling for Coal exploration. So far, on contractual basis a total of 70.47 billion tonne of Energy mineral resources and 7.62 billion tonne of Non-energy mineral resources have been established by MECL.

Physico-Financial Performance 2018-19, 2019-20 and 2020-21 (Anticipated)

7.84 The physical performance in drilling and geological reports for 2018-19, 2019-20 and 2020-21 is given in **Table 7.19** and the financial performance is given in **Table 7.20**.

Та	able 7.19:	
Physical Pe	rformance o	f MECL

	2018-19	2019-20	2020-21		
Items	Actual	Actual	MoUActual (Up toAnticipated UTargetDecember, 2020)March, 2021 (20		Anticipated Up to March, 2021 (2020-21)
Drilling (Mtrs)	6,10,953	6,38,801	6,00,000	4,19,922	6,00,000

Table No. 7.20: Financial Performance of MECL

(Rs. in crore)

	2018-19	2019-20	2020-21			
Items	Actual	Actual	MoU Target	Actual (Up to December, 2020)	Anticipated Up to March, 2021 (2020-21)	
Total Revenue #	378.49	447.02	414.00	282.72	414.00	
Operating Cost*	216.10	238.99	248.87	170.0	248.87	
Depreciation and DRE	7.75	9.42	14.00	7.65	14.00	
Net Profit After Taxes	100.60	146.13	108.35	78.17	108.35	

Including other income *Excluding Depreciation and DRE

7.85 Enhancement of Drilling Productivity of MECL is given in **Table 7.21**.

Table No. 7.21: Enhancement of Drilling **Productivity of MECL**

Year	2014-	2015-	2016-	2017-	2018-	2019-
	15	16	17	18	19	20
Productivity	378	402	465	539	542	562

*Meter drill per month.

Dividend Paid

7.86 MECL has paid a dividend of Rs. 44.83 crore to Government of India for the year 2019-20.

MoU Performance

7.87 MoU rating of MECL during last 3 years is given in **Table 7.22**.

Table 7.22

Year	Composite Score	Rating	
2017-18	63.39	Good	
2018-19	61.31	Good	
2019-20	96.00*	Excellent*	

*Anticipated

Initiatives of MECL towards combating COVID19

7.88 MECL stands with the whole nation to fight against the COVID-19 pandemic. MECL has taken various measures to protect the employees from COVID-19 and helps the society to survive in this pandemic.

7.89 MECL contributed an amount of Rs. 16.30 Lakhs on 30th April, 2020 to the Prime Minister's Relief Fund and Rs.2.0 Crores under the MECL's CSR initiative to the PM CARES Fund on 3rd April, 2020; meanwhile, complying with the instructions of Government of India, Ministry of Mines and DPE of continuing the full payment of wages to the contract workers as well.

7.90 About 2000 litres of Hand Sanitiser from the Ordnance Factory Board, Bhandara and 5000 masks were procured to replenish the supply of the same through the Collector & District Administration, Nagpur to the healthcare professionals of the Government Medical Colleges & Hospitals, Dispensaries and the local marginal community.



Photo 7.13: CMD, MECL handing over the Hand Sanitizer and Masks to District Collector, Nagpur

Central Public Sector Undertakings

Ministry of Mines

7.91 MECL in association with various NGOs distributed packaged food materials/ ration packets to the marginalized daily wage earners of the local community in and around Nagpur, with full support and collaboration from the local police.

7.92 Engagement with NITI Aayog, State Governments, District Authorities, Urban Local Bodies etc. continues for contribution of food / ration packets, sanitisers, face masks and any other essential commodities etc. to the marginalized poor and daily wage earners etc. across affected villages, talukas, cities and districts pan India.

7.93 MECL collaborated with the District

Administration of Ranchi and donated an Ambulance, under the Transforming Aspirational District Program (TADP) of Government of India which works for the improvement of the Aspirational Districts (such as Ranchi) specifically in the field of education and healthcare. Another Ambulance was donated to the District Health Officer of Nagpur District to be used at Public Health Centre, Dhanla, Taluk-Mauda, Nagpur District, under CSR Activity of MECL.

MECL has also displayed posters of COVID-19 Guidelines at Nagpur, Itwari and Ajani Railway Station as well as Indian Institute of Management (IIM), Nagpur.



Photo 7.14: Donation of Ambulance at the Public Health Centre at Dhanla, Nagpur



Photo 7.15: Donation of Ambulance to Ranchi District



Photo 7.16: Covid-19 Guidelines at IIM, Nagpur



Photo 7.17: Covid-19 Guidelines at Nagpur Railway Station

Achievements

7.94 MECL has empanelled private agencies for drilling, geophysical survey, Topographic survey and chemical laboratory to engage them on short term notice for fast tracking exploration.

7.95 During the year 2020-21, MECL has procured 3 drill machines for exploration of Lignite DR – 1500, Direct Rotary Heavy Duty

Truck Mounted machine. These new machines have been deployed at the Lignite Exploration Projects of Tamil Nadu & Rajasthan. This will further strengthen our capacities in the field of lignite exploration.

In addition to this, 1 no. of KDR -1000 has also been inducted and will be deployed for copper exploration at Rakha Chapri block, Singbhum Distt., Jharkhand. Further 2 more KDR-1000 drill rigs under process of induction.



Photo 7.18: DR – 1500 Drill Rigs

7.96 MECL has signed an MoU with NMDC Ltd. for exploration of Iron ore, Coal, Gold, Diamond and other minerals in various states. This collaboration is going to help in realizing Govt. of India "Aatmanirbhar Bharat Abhiyan" initiative and further strengthening import substitution by boosting the domestic mineral production.

7.97 MECL has also signed MoU with Odisha Mineral Exploration Corporation Limited (**OMECL**) for augmenting the exploration of Odisha's rich mineral resources.

Perspective on Non-Ferrous Minerals

7.98 During the year 2020-21 exploration for various minerals has been carried out by MECL in 28 blocks on behalf of National Mineral Exploration Trust (NMET). Out of these, Geological Report of 7 blocks has been submitted and work is in progress in remaining 21 blocks. A total of 466.82 million tonnes of mineral resources has been added to National Mineral Inventory.

The brief account of exploration activities by MECL for Government of India and State Government are as follows:

Photo 7.19: KDR – 1000 Drill Rig

- 1. Malangtoli Sub-block H (G-2), District Sundergarh (Iron ore): Geological Report is under preparation.
- 2. Babja block (G-2), District Bolangir (Manganese): Exploration work completed and Geological Report submitted in Nov. 2020. A total of 0.356 million tonnes of Manganese ore resource with 23.69 % Mn, 15.97 % Fe & 0.23 % P average grade with ≥ 18 Mn % cut off has been established. The resources have been categorised under 332 category of UNFC.
- Biarpali block (G-2), District Bolangir (Manganese): Geological Report prepared and submitted for peer review.
- Dungripalli (G-3), District Bolangir (Manganese): Geological work and analysis is under progress in the block. So far, 828 m of drilling in 11 closed boreholes completed. Timeline for GR submission is March 2021.
- 5. Sendurkar (G-2), District Kabirdham, (Bauxite): Geological work and analysis is under progress in the block. A total of 334 m of drilling in 23 boreholes

have been completed. Timeline for final Geological Report submission is February 2021.

- Baraganda (G-2) District Giridih (Copper): Geological work and analysis is under progress in the block. A total of 5,491m of drilling has been completed in 30 closed boreholes. Timeline for Geological Report submission is March 2021.
- 7. Silpunji (G-3) District West Singbhum (Iron & Manganese): During the month 415 no. of Gravity and Magnetic stations have been recorded. So far, a total of 1,980 stations have been recorded. Geological mapping and survey are in progress. Timeline for Geological Report submission is May, 2021.
- Adanakurichi (G-2) District Ariyalur (Limestone): Analysis is in progress. A total of 712 m of drilling has been completed in 7 closed boreholes. Timeline for Geological Report submission is March 2021.
- 9. Alathiyur (G-2) District Ariyalur (Limestone): Drilling work completed. Analysis is in progress. A total of 590 m of drilling has been completed in 7 closed boreholes. Time line for Geological Report submission is March 2021.
- 10. Unjini (G-2) District Ariyalur (Limestone): Exploration work completed, Geological Report submitted during the month of Dec. 2020.A total of 12.36 m.t. limestone resources estimated with 8.31 m.t. of cement grade, 0.63 m.t. of blendable grade and 3.43 m.t. of threshold grade resources under 332 category of UNFC.

- **11. Anandwadi (G-2), District Ariyalur (Limestone)**: Geological Report prepared and submitted for peer review.
- 12. Selu (G-2), District Udaipur (Magnesite): Sampling and analysis is in progress. A total of 1350 m of drilling has been completed in 43 closed boreholes. Time line for Geological Report submission is May 2021.
- Lakhasar, (G-3) District Bikaner (Potash): Exploration work completed, Geological Report submitted in June, 2020.
- 14. Lakhasar (Extension area), (G-3) District Bikaner (Potash): Further exploration is under progress in the block, Drilling commenced and during the month of Dec. 2020. So far, 337.20 m of drilling has been carried out in 1 running BH. Timeline for Geological Report submission is March, 2022.
- **15.** Bharusary block (G-3), District Hanumangarh (Potash): Drilling commenced and during the month 118.10 m of drilling has been carried out in 1 running BH. Timeline for Geological Report submission is January, 2022
- 16. Nailaki Dhani (Khetri) block (G-3), District Jhunjhunu (Copper): Drilling commenced and during the month 25 m of drilling has been carried out in 1 running BH. Timeline for Geological Report submission is May, 2022
- RMML, (G-2), District Bellari (Iron Ore): Drilling and survey work in progress, During Dec. 2020, 318 m of core drilling has been carried out. So far, 1316 m of RC & Core drilling has been carried out in 11 closed and 3 running boreholes. Time

line for Geological Report submission is August, 2021.

- Veeranam Block I, (G-1) * District Cuddalore (Lignite): Exploration work completed, Geological Report submitted in June, 2020. A total of 366.48 million tonnes of Lignite resources has been established having grade 2000-2500 Kcal.kg.
- Veeranam Block II, (G-1) * District Cuddalore (Lignite): Geological Report prepared and submitted for Peer Review.
- 20. Veeranam Block III, (G-1) * District Cuddalore (Lignite): Drilling and survey are in progress, During Dec. 2020, 831 m of core drilling has been carried out. So far, 1545 m of drilling has been carried out in 7 closed and 1 running boreholes. Drilling and survey are in progress. Time line for Geological Report submission is June, 2021.
- 21. Recherla, (G-2), District West Godavari, (Coal): Geological Report prepared and submitted for peer review.
- 22. Tamiya block (G-4), Bolangir Project, District Bolangir (Manganese): Work completed, Geological report prepared and submitted in June, 2020. Resources not estimated.
- 23. Rengaliblock (G-4), Bolangir Project District Bolangir (Manganese): Completed. GR submitted on 31st Aug 2020. MECL estimated 10881 tonnes of Mn ore with 18.80% Mn, 20.34% Fe & 0.07% P at 18% Mn cut off.
- 24. Biarpali block (G-4), Bolangir Project District Bolangir (Manganese): Geological Report prepared and submitted for peer review.

- 25. Babja block (G-4), Bolangir Project District Bolangir (Manganese): Geophysical survey work completed and report submitted in Nov. 2020. Due to local problem, further exploration could not be commenced.
- 26. Antapali block (G-4), Bolangir Project District Bolangir (Manganese): Geophysical survey commenced and 500 no. of Gravity and magnetic stations were recorded. Drilling will be commenced after completion of Geophysical survey. Timeline for Geological Report submission is November, 2021.
- 27. Kumiapaliblock (G-4), Bolangir Project District Bolangir (Manganese): During the Dec. 2020, 180 m drilling carried out. So far, a total of 285 m drilling carried out in 3 closed and 1 running borehole. Timeline for Geological Report submission is November, 2021.
- 28. Deravad block (G-4Extension), District Udaipur (Copper): Drilling completed and analysis is under progress. A total of 330 m of drilling has been carried out in 3 closed boreholes. Timeline for Geological Report submission is December, 2021.

Baseline Environmental Studies

7.99 Report of Baseline Environmental studies through Remote Sensing submitted for Tamiya, Rengali, Babja, Biyarapalli and Dungarpalli Manganese Block, District: Bolangir, Odisha. Baseline Environmental studies are in progress for three NMET blocks i.e. 1) M/S. RMMPL (ML No. 2010) Block, NEB Range, Sandur Schist Belt, District. Bellary, Karnataka, 2) Baraganda Copper Block, District: Giridih, Jharkhand, and 3) Selu Magnesite Block, District: Udaipur, Rajasthan. Mineral targeting of copper and associated minerals by using Remote Sensing for Namapur Copper Block is in progress.



Figure 7.1: Land Use Land Cover Map of (10 Km Radius Area from The Center Of Exploration Block) Tamiya, Rengali, Babja, Biyarapalli And Dungarpalli Manganese Block, District: Bolangir, Odisha

Action Taken on Abatement of Pollution and Environment

7.100 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. The exploration activities of MECL do not cause any significant pollution. As a part of exploration work, MECL is carrying out environmental studies to generate baseline environmental data on Geology & Geomorphology, Meteorology, Air Quality, and Noise, Land use / Land cover studies, Soil quality, Biota, Water regime & Socio-economic studies. Report of Baseline

Environmental Studies are annexed with all the Geological Reports. These reports are handed over to State Govt. along with Geological Reports. This data is used for Environmental Impact Assessment (EIA) studies during and/ or after mining.

7.101 For helping the exploration/exploitation agencies to plan measures for abating possible pollution and Environmental Impact Assessment (EIA) in various exploration projects a report on the same is included as a part of G-2 level Geological Report of various exploration projects. As per the guidelines of MoEF&CC, MECL is preparing the baseline environmental report since 1993.

7.102 MECL has prepared a Corporate Environment Policy. The objective of the policy is to execute exploration and its associated operations in an environmental friendly responsible manner to comply with applicable laws and other requirements related environmental aspects with due consideration of sustainable development. Some of the important objectives of the policy are as follows:

- To execute exploration and its associated operations in an environmental friendly responsible manner to comply with applicable laws and other requirements related environmental aspects with due consideration of sustainable development.
- To use non-polluting and environment friendly technologies
- To maintain the machineries in excellent condition and ensure minimum impact of its operation on environment.
- To ensure compliance of Environment Clearance (EC) and Forest Clearance (FC) conditions and other statutory conditions issued by regulatory authorities from time to time for environment protection.
- To conserve the natural resources by ensuring minimum wastage an optimum consumption of fuel oil, lubricant oil, water and electricity.
- To develop awareness on environmental responsibilities among employees and encourage adherence to sound & healthy environmental practices.

The detailed policy is available on www.

R&D Projects

7.103 To enhance the mineral exploration initiative, MECL continuously make efforts on Research and Development in mineral exploration.

7.104 With objective of advancement in drilling production and productivity, various drilling fluid technology has been implemented in order to increase penetration rate and core recovery while drilling, to reduce drilling hindrance during operation and to minimize the drilling fluid loss and keeping the borehole open for maximum drilling production. MECL is upgrading its drilling fluid technology by generating and analyzing the drill fluid consumption data for various minerals exploration work i.e. Coal, Lignite and Base metals to increase the drilling efficacy and productivity.

7.105 MECL has recently procured one Time Domain Electromagnetic (TDEM) viz. "Terra TEM 24 receiver with Terra TX-50 transmitter" of Monex Geoscope, Australia, which is widely used for base metal exploration, salt water intrusion zones and to delineate confined & unconfined aquifer etc. The major advantage of the TDEM is that it does not require any contact with the surface and very useful where top strata is too resistive where normal resistivity survey has been failed. It is helpful tool to explore deep seated conductive target.

7.106 MECL has also procured and commissioned one "Inductively Coupled Plasma-Atomic Emission Spectroscopy (ICP-OES)" which is a powerful technique for the analysis of geological samples, due to its high throughput and multi-element analytical

capabilities. All elements in an ICP package are determined in one aspiration. This instrument gives very precise and accurate results from ppm to percent concentration levels on the same solution with no additional calibration. Apart from that this is advantageous in terms of analysis time and sample consumption.

7.107 ICP-OES is capable of doing elemental analysis accurately & precisely for REE and PGE and trace elements in higher concentration, trace and ultra-trace (ppm, ppb and ppt) levels. Since its installation, this instrument is used for the analysis of minor and trace elements in Manganese Ore, Bauxite ore, Iron Ore, Limestone, Copper Ore.

7.108 Recently MECL has procured one Coal Petrography Microscope with camera and reflectance module facility (Leica DM4P attached camera (DF450C) with Reflectance module (JMW-MSP-200)) for study of Coal Petrography.

The Coal Petrography in coal exploration is helpful for identifying and correlation of the coal/ lignite seams resulting in the structural interpretations, determination of coal rank, blending characteristics, changes in coalification within seam and coking properties.

Apart from the above in CBM exploration, the coal petrographic studies especially the reflectance measurement will be helpful in determining the different maceral composition which yield maximum methane. With this background the occurrence of methane gas can be searched for in different coalfields etc. Again, cleat and micro pore studies also guide in CBM storage and permeability of the reservoir.

The commissioning of the instrument is under progress.

Information Technology

7.109 Using available Information Technology (**IT**) infrastructure, data processing of total 32 Nos. of Geological reports for the blocks explored by MECL, under Contractual exploration and NMET were carried out for the financial year 2020-21. This includes completion of 17 nos. of Report of Base metal, 9 nos. of Coal exploration reports, & 1 no. of Lignite exploration report. The report of remaining 5 blocks will be submitted by March 2021.

7.110 SAP ERP- "Khanij Sanjeevani" implementation in MECL: As a part of its plan to use digital technology tools to enhance its capabilities, MECL has successfully implemented the ERP (Enterprise Resource Planning) solution of SAP. The ERP solution is implemented to automate the business processes/ operations of MECL in the areas of finance & costing, marketing, drilling, exploration, project management, sample preparation & testing, materials & stores, procurement and Human Resource Management. To facilitate the access to the ERP solution and ensure business continuity. MECL has installed a latest state of the 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. The ERP solution is implemented to provide the following business benefits/ business objectives:

- Enhancing Customer focus in terms of timely completion of drilling/exploration activities, accuracy in billing and reconciliation
- Improving the Efficiency of operations efficient usage of machines, tools and accessories

Central Public Sector Undertakings

Ministry of Mines

 Proactively Ensuring Transparency/ compliance to all the stake holder requirements and government regulations.

The ERP solution completed the key mile stone of **'GOLIVE'** during the year. All the key transactions are carried out through the ERP system.

MECL has conceptualized plan for implementing a Business continuity process for the ERP solution. Detailed specifications for Disaster Recovery (DR) system have been formulated and finalization of an agency for providing DR services is in progress.

7.111 Geological & 3D ore body modelling is the intrinsic part of Geological Report based on which resource/ reserves are estimated.

In this connection, MECL has impeccable credentials in the uses of technological innovative products which are both best in class & globally acceptable.

The exploration/ geological software's like GDM, MINEX, and SURPAC were upgraded during the year and the use of the upgraded version of software is used in preparation of geological report, has resulted in using recent technology particularly in 3D modeling. The **DATAMINE Software**, was upgraded by taking up its AMC and is being used for carrying out **3D Geological Model for nonstratified deposits**. Training was provided to officials of Exploration and IT Divisions for the new software's purchased like, BrisCAD, and GeoTools. New Antivirus Server Licenses and standalone Licenses were procured for CHQ and other offices in Nagpur.

7.112 In addition to the industry software, the MECL has developed several in-house software to improve data processing and interpretation

thereof. These customized software facilitate creation of block models, borehole correlation & fence diagram.

7.113 MECL has developed software's like, File Tracking Software, CLIP Software and also upgraded employee portal called "MECL Connect" Software. These software will be later hosted on NIC Cloud server. "MECL Connect" is online HRMS activity of MECL, and is accessible to all employees from MECL's website. It has been upgraded and made bilingual. Added many more new modules like new online live video streaming, made it dynamic as per requirement. Modules for viewing of Internal Circulars, notices, announcements. various procurement Formats, daily progress reports, MECL Policies etc.

7.114 Globally seam correlation is a basic requirement of resource estimation of coal & lignite. In order to improve and ensure correlation of processing and interpretation, MECL has been using inhouse software for the same, which is well acceptable by all the stakeholders in the industry. Enhanced Graphic Correlation Plate generation program where given seams gets correlated based on same seam's floor depth in adjacent borehole in respective CAD layers. Previously correlation lines were joined by operator manually, now using this program graphic correlation plates easily gets prepared

Business Development Activity

7.115 Through Business Development & Commercial Division, rigorous efforts are being continued to generate/obtain more works from prospective clients through competitive techno-commercial offers and MoU route as well as bilateral negotiations. As a result, during the financial year 2020-21, the

total value of order book stood provisionally at Rs.400.06 crore up to 31.12.2020. This includes contractual work of various clients such as CMPDI, DMG Karnataka, MOIL, HCL, NALCO, DMG Jharkhand, DGM Assam, HGML, KIOCL, CIL, etc. and NMET funded work on behalf of Ministry of Mines and promotional coal exploration work on behalf of Ministry of Coal (MOC).

7.116 During the period, MECL has also signed MoU with National Mineral Development Corporation (NMDC) on 21.12.2020.

7.117 Efforts were made to reach out to all prospective clients viz. Government, PSU and Private Sector for securing business for the company for sustainable growth. This is timeless and can be used forever.

7.118 The new diversified areas are given below:

- i. Greenfield Exploration in blocks for various minerals allotted by NMET, Government of India.
- ii. Management consultant for BGML and similar clients
- iii. Analysis of Referee samples for coal.

Future Plan and Technology Upgradation

7.119 To achieve its vision, MECL has prepared 'Corporate Rolling Plan' from 2020 to 2023 for Enhancement in Growth and Profitability of MECL'. Salient features of the Corporate Rolling Plan are given below:

• Exploring new Business Models of providing Consultancy Services, preparing Feasibility Reports for pre & post-auctioning of mineral acreages.

- Taking up G-4 level exploration including critical and REE minerals.
- Taking up mining of suitable mineral blocks.
- Enhancing capability of Geo-chemical laboratory.
- Training and Skill Development of Human resources for effective adoption of latest technologies in exploration.
- Adoption of directional drilling for deep seated minerals.
- Adoption of modern geophysical techniques for faster assessments and Drone Technology for aerial geophysical and topographic survey.
- Procurement of Hand held XRF Core Analyser, digital geological core logging & analysis system and high-speed hydrostatic drill rigs.
- Upgradation of IT enabled Geological Modelling and 3D ore body modelling capability.
- Dove tailing of mineralised zones for brown field exploration campaigns.
- Data management and Data mining for post auction support.
- Augmentation of Geological Reports for making auctionable blocks.
- Mining related consultancies for Energy and Non-energy minerals.
- Energy optimization by installation of Roof-top Solar power system in MECL premises/ buildings.
Manufacturing Unit

7.120 MECL has a well-equipped central workshop and manufacturing unit at Nagpur to cater to the needs of drilling and to provide engineering support to field operations. It carries out repairing/ overhauling of drilling 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 manufacturing of drill tubular. During 2020-21 (up to December 2020) a total of 1178 items were manufactured, which include 250 TC bits and 928 other drill accessories. The inhouse manufacturing of above accessories has resulted in timely supply of item required for drilling operations well in time. Thereby reducing the idle hours of drill rigs. This adds to MECL's cost optimization and enhanced operational profit. Further, this is also a make in India initiative of MECL to develop in house capabilities.

Energy Conservation

7.121 MECL is replacing age old drill rigs with new Hydrostatic drill rigs which are fuel efficient, high performance capacity and have resulted in conservation of energy. By induction of hydrostatic drill rigs the consumption of HSD has reduced by 5 to 10 percent with respect to productivity. The company has also set up POL Norms for all types of drilling machineries and is maintained effectively based on energy conservation factors. Corrective measures like fuel pump and nozzles calibration of each drill rig, tappets setting etc. are being carried out regularly for enhancing the fuel efficiency, carbon emission reduction and thereby resulting considerable energy saving. All the conventional and CFL lights are being replaced with energy efficient LED bulbs and tube lights. MECL has started replacing conventional source of energy with non-conventional Renewable sources from year 2011-12 by Installation of Solar power plant and Solar Water Heating System. During 2020-21, 245 KWp solar photo-voltaic plant is under installation process at MECL premises.

Bharat Gold Mines Limited (BGML)

7.122 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. However, the Cabinet decision could not be implemented due to litigation. Finally in 2013, the Supreme Court allowed the Government to implement cabinet decision.

7.123 Meanwhile, many changes had taken place, hence the Cabinet decision of 2006 could not be implemented. It was decided to explore the possibilities of revival of BGML after Techno-Economic Feasibility Study (TEFS). A Monitoring Committee is supervising all the work regarding suggesting a way forward for BGML by doing legal review, asset Valuation, TEFS, Techno-Economic Feasibility Report (TEFR), etc.

7.124 Ministry of Mines is getting the exploration of KGF mining lease area and processing of tailing dumps through Mineral Exploration Corporation Ltd. (MECL) and Non-Ferrous Technology Development Centre (NFTDC) respectively. MECL has started the exploration in Betraswamy Block of BGML. NFTDC has done preliminary processing of the tailing dumps of BGML and found gold and wolframite with associated rare earth elements. Pilot plant processing of BGML tailings started operations on 6th November 2020 and first

result of 10 tons sample processing is expected very soon. Any future course of action in respect to BGML can be decided only based on the results of exploration/ beneficiation results of mine tailings report and subsequent techno-commercial feasibility report.

7.125 As sorting out of long pending issue of mutation and RTC work of the 12109 acres and 28 Guntas of BGML land in Kolar Gold Fields, the State Government has incorporated "Bangardhagani" village in the Revenue Records (which was missing earlier) and extent of land over an area of 7170 Acres and 24 guntas under survey No. I & 2

of "Bangardhagani" village belongs to BGML has also been incorporated and mutation and RTC has been issued in favor of BGML. RTC for remaining area of 4939 Acres and 04 guntas of BGML land spread over 52 different survey numbers under 29 villages have already been collected. Reconciliation of BGML land as per RTC and sale deed is in progress with BGML.

7.126 Alongside, Ministry is considering for transfer of 49 acres and 28 "guntas of BGML land to South Western Railway for the construction of Marikuppam-Kuppam new Broad Gauge Railway Line, which will benefit local people.

8

Science, Technology and Autonomous Bodies

Annual Report 2020-21

135

Science, Technology and Autonomous Bodies

Science, Technology and Autonomous Bodies

•	Science & Technology Programme R&D component	Page -	137
•	Jawaharlal Nehru Aluminium Research Development & Design Centre	Page -	138
•	National Institute of Rock Mechanics	Page -	141
•	National Mineral Exploration Trust (NMET)	Page -	145

Annual Report 2020-21

Science, Technology and Autonomous Bodies

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 Research and Development (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), (iii) one-time capital component for upgradation 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 environmentally 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, which includes rock mechanics. mine designing, minina equipment, conservation, energy

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 valueadded 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. Ministry of Mines has launched SATYABHAMA (Science and Technology Yojana for Aatmanirbhar Bharat in Mining Portal for Advancement) Science and Technology Programme Scheme of Ministry of Mines. This has resulted in steep increase of nearly 300% in number of project proposals from 2019-20 to 2020-21. The SATYABHAMA Portal can be accessed at https://research. mines.gov.in/.

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 2020-21, 28 project proposals were recommended by PERC for approval of SSAG. Out of these, 22 projects, which were considered as relevant to the identified priorities, have been approved by SSAG for grant-in-aid by the Ministry under S&T programme and decision will be taken on 5 projects after further examination. The details are available at research.mines.gov.in.

Information Education and Communication (IEC) Component

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 The detailed guidelines are available at https://research.mines.gov.in/.

"Grants for Creation of Capital Assets" Component for upgradation of R&D facilities

8.7 The quality of R&D hinges upon availability of state-of-the-art research facilities in the country. Apart from the initiatives of the public and private enterprises in the mining sector, R&D activities are also being pioneered by the two autonomous bodies functioning under Ministry of Mines i.e. (i) Jawaharlal Nehru Aluminium Research Development & Design Centre (JNARDDC), Nagpur, and (ii) National Institute of Rock Mechanics (NIRM), Bengaluru. During the financial year 2020-21 (till 31.12.2020), grant to the tune of Rs. 322 lakhs has been released to JNARDDC and Rs. 147 lakhs has been released to NIRM for upgradation 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 two autonomous institutions under Ministry of Mines is given in **Table 8.1** and **Table 8.2** respectively.

Table 8.1 : Grants for Creation of Capital Assets

Institute	Amount (Rs. in crore)
JNARDDC	3.22
NIRM	1.47

Table 8.2: Grant-in-aid-Salaries

Institute	Amount (Rs. in crore)
JNARDDC	6.70
NIRM	6.74

Merger of National Institute of Miners' Health with National Institute of Occupational Health (NIOH)

8.9 National Institute of Miners' Health (**NIMH**), an autonomous Institute under Ministry of Mines (MoM) has been dissolved and merged / amalgamated with ICMR-National Institute of Occupational Health (**NIOH**), Ahmedabad, Ministry of Health & Family Welfare (**MoH&FW**) with all assets and liabilities.

Jawaharlal Nehru Aluminium Research Development and Design Centre, Nagpur

8.10 Jawaharlal Nehru Aluminium Research Development and Design Centre (**JNARDDC**) is a Central Government Autonomous Body under Ministry of Mines. This "Centre of Excellence" was set up in 1989 with a view to provide major R&D support system for the emerging modern aluminium industry in India.

8.11 JNARDDC is 17025:2017 NABL accredited lab and 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.

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

8.13 JNARDDC has made key contributions in the areas of beneficiation, characterization, technological evaluation, upgradation of bauxites, Bayer process modeling, reduction of energy consumption and environmental pollution in smelter, development of alloys, product development, effective utilization of aluminium industry residue such as red mud, dross, spent pot lining and scrap for both primary and secondary industry. The annual reports of JNARDDC are available at http:// www.jnarddc.gov.in/en/rti/rti_annual_ report.aspx

8.14 Major activities

The Centre completed three projects in the field of aluminium and seven R&D projects are in progress for various government and non-government organization. The details are mentioned in **Annexure 8.1**.

8.15 Designated Sector Expert

JNARDDC is the designated aluminium sector expert for the following key authorities: -

NITI Aayog -

- REE (Rare earth element) from red Mud and coal fly ash
- Strategy paper on Resource efficiency in aluminium sector

- **Bureau of Energy Efficiency** (**BEE**), Ministry of Power –
 - Sector expert for "National Mission for Enhanced Energy Efficiency"-PAT 2/3 cycle
- **BIS**, Bureau of Indian Standards for standards
 - o Guidelines for Al-scrap
 - Standard for aluminium alloys
- **CPCB**, Central Pollution Control Board
 - Guidelines for bulk utilization and safe disposal of red mud
- DST, TIFAC (Dept of Science & Technology) –
 - "Bauxite-Status, Challenges, Opportunities & Road Ahead" for addressing the technological issues of bauxite.
- European Union
 - Resource efficiency program in aluminium sector
 - o Bulk utilization of red mud
- MoM (Ministry of Mines)
 - Draft Aluminium Scrap Recycling policy
 - Techno-economic study of aluminium scrap
 - Resource efficiency in aluminium sector
 - IMC for import substitutes in Alindustry
 - Quality Control Order for aluminium products
 - AIMS (Aluminium import monitoring system)

8.16 International collaboration



JNARDDC, Nagpur and Russian Union of Producers. Suppliers and Consumers of Aluminium, (Russian Aluminium Association), ASSOCIATION Moscow signed an MOU on

3rd August 2020 for long term

co-operation between Russian and Indian companies related to aluminium production transformation, knowledge and and experience sharing to increase aluminium production, promoting direct partnerships between aluminium processing facilities as well as between R&D institutes, development of techno-parks (clusters) for the aluminium industry, setting up joint ventures between Russian and Indian enterprises including facilities producing high level aluminium products etc. They published the details of JNARDDC in their website for creating greater visibility of JNARDDC and aluminium research activities in India. http://www.aluminas.ru/media/ interview/anupam_agnikhotri_alyuminiy_ strategicheskiy_metall_budushchego/

8.17 JNARDDC conducted the following webinars

- 9th International Bauxite, Alumina and Aluminium Society (IBAAS-2020) webinar from 4-6 Nov 2020. http://www.ibaas.info/
- 24th International symposium Non-Metals ferrous Minerals & 即得 (ICNFMM-2020) webinar 15 Dec 2020. http://nonferrousmeet.net/

8.18 Patent

One patent was filed vide no. 202021022813 dated 31.05.2020 (Inventor – Dr Md Najar PA) for the indigenous R&D process developed

by JNARDDC. Title - "A Process for selective separation and recovery of alpha alumina and silica".

Θ 8418 022109005 NTELLECTUAL ROPERTY INDIA MENT OF INDIA THE PATENT OFFICE PATENT CERTIFICATE 340211 We will Patent his 3582MUM0014 seiter #, / Jeoleana lie. 13/11/2014 ups and a cibi/Date of Para JANANARIAL NEHRO ALUMINIAN RESEARCH DEVELOPMENT AND DEIRON CONTRE ARA/Patentes endres Res was 3 In 128 et andre wilve 8 wavefor PROCESS FOR SELECTIVE INSTITU DISSOLUTION OF ALUMINA AND SILICA BLAVINO MINISTRAL PHASES IN BANNIE AT ROOM TELEPRATURE FOR GEOJANA VICAL APPLICATIONS was admired by the 128 addres, was 8 met 8 anger are refer 13th day of November 2014 8 der et 4 andr 8 in 182 ages Res au 2. It is hereby certified that a potent has been granted to the patentee for an invention entitled PROCESS FOR SELECTIVE IN SITU DISSOLUTION OF ALUMINA AND SILICA BEARING MINERAL PHASES IN BAUXITE AT ROOM TEMPERATURE FOR GEO ANALYTICAL APPLICATIONS as disclosed in the above mentioned application for the term of 20 years from the 13th day of November 2014 in accordance provisions of the Patents Act, 1970. other We house urt - on the 2 vector 2 the day of oil over no we k, 120 day of Recentlar 20160 dr wit wave also ed 8 within to dry

One patent was granted vide Patent no. 340231 dated 02.07.2020 (Inventor - Dr Md Najar PA) for "Development of process for selective in-situ dissolution of alumina & silica bearing mineral phases in bauxite at room temperature for geo-analytical application". The selective and self-sustained dissolution of alumina (Al2O3) and silica (SiO2) bearing mineral phases in bauxite such as gibbsite and kaolinite at room temperature enable rapid determination of the mineral constituents both at the exploration site as well laboratory with comparable accuracy. The distinguished advantage of the process is its easy flexibility and portability to remote mining sites for quick assessment of bauxite and laterite samples and need of minimum infrastructural support

Science, Technology and Autonomous Bodies

8.19 Finances

JNARDDC is likely to achieve an Internal and Extra Budgetary Resource generation (IEBR) of Rs.2.00 crore in 2020-21. A revenue budgetary grant of Rs.6.70 crore for salary component and Rs.3.22 crore was allocated for creation of capital assets by Ministry of Mines in 2020-21 for the Centre.

National Institute of Rock Mechanics

8.20 National Institute of Rock Mechanics (NIRM) carries out various investigations in the area of rock engineering and rock mechanics. The high-quality services provided by NIRM have found wide acceptance in the industry. With modern equipment and a coherent team of experienced and dedicated Scientists, NIRM combines research activities and consulting services to provide solutions for a wide range of rock engineering problems. The Institute extends R&D support and expertise to mining sector (underground, opencast and guarries), energy sector (hydel, thermal and nuclear power) and infrastructure sector (rail, road, metro, irrigation, urban construction etc.). Key area of activities of the Institute involves site characterisation studies which includes geological, geophysical & geotechnical investigations, excavation engineering, controlled blasting, numerical modelling, engineering seismology, seismotectonic studies, mine design, slope stability, laboratory testing of rock samples & wire ropes and in-situ testing of various mining accessories using NDT technique. Complete portfolio of various areas of activities of NIRM is available at its website www. nirm.in.

8.21 In addition to ensuring safety of its employees during the pandemic, continuous efforts were made to ensure enhancing

scientific and administrative skill sets, online interaction with industry, attending various webinars in rock mechanics and geosciences. NIRM started Friday Technical Lecture Series as part of the productive activities during the lock down period. So far 16 lectures have been completed with average participation of 30 scientists during each lecture. This weekly lecture series enabled technical interaction among scientists of the organisation, instilling strong sense of technical collaboration between its various functions and carrying forward the same for providing solution to mining and civil industries.

8.22 During the pandemic period, online Technical Training in various areas of rock mechanics and allied special topics was imparted to the technical staff. These ranged from upskilling in advanced software analysis, landslide hazard and mining techniques. Online Training for Administrative procedures, Government e-Market procedures (GEM), procedures Financial (GFR), were also imparted to employees in order to harness synchronisation administrative of and technical activities with various objectives of the organisation. Special task-based initiatives were taken to ensure sanitised and safe workplaces during the pandemic lock down period.

8.23 During the current reporting period, many innovative techniques were used to solve the industry problems. Some of the important contributions are listed below:

(i) Geophysical investigations were carried out to analyse the likely impact of the enhanced induced vibrations due to landing and take-off of the heavier and more frequent aircrafts after the proposed expansion of the runway by 260m towards the Dumas end at Surat Airport. Vibration data of over 69 flights were recorded in all directions on the surface as well as in the borehole and exposed segments of the pipeline. Based on a through trend analysis of the decay of vibrations, the impact of the likely vibration reaching the pipeline following runway expansion was projected. It was found that even after the runway expansion, the buried pipeline would be safe from the adverse effects of vibration-induced damage. However, direct landing on the pipeline was found unsafe unless proper vibration isolation measures were implemented.

- World's 2nd largest lift irrigation project: (ii) The Palamuru Ranga Reddy Lift Irrigation Scheme (PRLIS), Telangana would drought facilitate irrigating prone regions of the state, and the engineering geological investigations and the subsequent technical inputs of NIRM along with recommendations for suitable engineering measures would ensure the life of this project for next 100 years
- (iii) Critical Angle Excavation of Draft Tube: The strategic engineering design of excavation in the choked tunnels of the Punatsang Chu Hydroelectric Power Project, Bhutan under adverse geological conditions enabled progress of the hydel project. The technical inputs of NIRM along with recommendations for suitable engineering measures ensured durability of the geo-structures.

8.24 Most of the technical departments of NIRM are accommodated at its head office at Bangalore while all types of testing facilities are located at its registered office at Kolar Gold Fields. In addition, NIRM plans to develop a skill development centre in the near future for

the benefit of the mining sector.

8.25 During the reporting period between 1st January to 31st December 2020, the institute received 36 new projects from the industry during the pandemic and completed 41 industry projects. The List of completed projects can be accessed from their website at the following link: https://nirm.in/

8.26 Over 40% of the revenue budget of the Institute is earned as Internal and Extra Budgetary Resources (IEBR) from industry sponsored projects. As a part of human resource development and human resource augmentation, NIRM has been organising workshops and training programs for the industry and deputing its employees to various training programs and international/ national conferences. For the period January – to March 2021, NIRM would focus on completing some of the ongoing projects and look for more opportunities in mining, hydel and infrastructure projects.

8.27 Some of the major ongoing projects that are being executed by the Institute during Jan – Dec 2020 include:

- Engineering geological investigations of cut slopes for intake pool, upstream and downstream hillock above pressure tunnels and powerhouse area and tailrace pool of Indra Sagar Polavaram Hydro Electric Project;
- Geophysical investigation to study the rock mass condition around the sinkholes and abandoned coal working in the Umariya District, MP;
- MASW survey and measurement of vibration parameters around tailing dam of Bailadila mines;

- Scientific Study for assessing the stability of pit & dumps and design for strengthening of benches for opencast,
- BPM & benches above proposed decline portal of Kaliapani Chromite Mine, Balasore Alloys Ltd.;
- Scientific Study for stability assessment and monitoring of Pit and Dump at 3 nos. Budgauna, Hinauti and Majhgawan Limestone mines at Sidhi Cement works;
- Determination of In-Situ stress parameters (Magnitude, Direction & Gradient) of the overlying roof strata for orientation of Longwall panel at Muraidih Colliery, Barora Area, BCCL, Dhanbad;
- Analysis of Geotechnical & Geodetic Instrumentation Data at C-3 Package of Punatsangchhu-II Hydroelectric Project, Bhutan; Cap Rock Stability at Central Baroi Mine, HZL vis-a-vis Depillaring of Remnant Pillars – A Critical Appraisal;

- Blast Design for Graded Material to Construct Break Water for Vizhinjam, Thiruvananthapuram, HOWEEngineering Projects (India) Pvt Ltd.;
- Monitoring of ground vibration and air overpressure due to blasting carried out for construction of Hydro-Technical Structure of unit 3 and 4 at Kudankulam Nuclear Power Plant, Kudankulam, L&T, Tamil Nadu;
- Procedure for controlled blasting and monitoring of ground vibration for rock excavation at Kaiga 5&6 site, Kaiga, NPCIL;
- QA support for the On-going Geological/ Geotechnical investigations at Mahi Banswara Rajasthan Atomic power project.

8.28 At present there are 82 industry projects. List of ongoing projects can be accessed from their website at the following link: https://nirm.in/ongoing-projects.php



Figure- 8.1: Vibration data during flight take-off being recorded at Surat airport

Annual Report 2020-21



Figure- 8.2: Critical angle excavation of Draft Tubes at Punatsang Chu Hydroelectric Power Project, Bhutan



Figure- 8.3: Engineering geological investigations in progress at the foundation of PRLIS, Telangana

National Mineral Exploration Trust (NMET)

8.29 The National Mineral Exploration Trust (**NMET**) was established by the Central Government by notification dated 14th August, 2015 in pursuance of sub section (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. As per the Act, the holders of Mining Lease and Prospecting Licence-cum-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.

8.30 The total NMET fund accrued as on 31st December, 2020 is Rs. 2604.91 Cr and total expenditure of NMET till 31st December 2020 is Rs. 299.02 Cr., out of which Rs.62.37 Cr. has been incurred during the year 2020-21 (till 31st December, 2020).

8.31 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. 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 Notified Exploration Agencies (NEAs) for NMET funding. The TCC recommends the suitable proposals to EC for approval. The minutes of meetings of EC and TCC are available https://nmet.gov.in/content/circularat listing.php.

8.32 During the year, a total of 04 meetings of TCC and 01 meeting of EC were held. A total of 07 mineral exploration projects were approved by the EC in 17th EC meeting held on 5th Nov, 2019 with an estimated cost of 40.72 Crore. A Schedule of Charges (**SoC**) for NMET funded projects was also approved and implemented w.e.f. 01stApril, 2020. In SoC, there is a provision of Exploration Incentive (**EI**) of 10% of the approved cost of the project for G4 items in Greenfield areas for gold, base-metal, other precious minerals, strategic/ critical minerals and fertilizer minerals, if the block is upgraded from G4 to G3 stage.

8.33 National Aero-Geophysical Mapping Program (NAGMP) with Magnetic- Gradiometry and Radiometric Surveys has been taken up by GSI through NMET Fund to acquire uniform aero-geophysical data, initially over the areas of Obvious Geological Potential (OGP) followed by coverage of whole country by engaging Project Implementing Agencies (PIA) with an objective to (1) Acquire high resolution baseline aero-geophysical data, (2) Identify new target areas for mineral prognostication, (3) Understanding subsurface geological and structural set up. The OGP area has been divided into Phase-I (Blocks-1 to 4), Phase-II (Blocks-5 to 8) and Phase-III (Blocks-9 to 12).

8.34 Under NAGMP, the work of OGP blocks-1, 2, 3 and 4 (Phase-I) have been completed. The final reports and all deliverables data over OGP blocks 1, 2 and 4 have been reviewed and submitted to NMET Secretariat. Based on integration of these aero-geophysical data with archived geophysical, geological and known mineralization data, a total of 60 potential blocks have been identified for follow up action. Data acquisition over OGP blocks-9, 10, 11 and 12 (Phase-III) are in progress.

National Non-ferrous Metal Scrap Recycling Framework, 2020

8.35 India is one of the fastest growing economies in the world. Strong domestic demand coupled with several reforms that the government has undertaken are on track to maintain the economic growth momentum going forward. As non-ferrous metals find widespread applications across the economy, the current policy measures provide a tremendous opportunity for the development of the Indian non-ferrous metals industry in the future.

8.36 One of the key challenges faced by the non-ferrous metals industry is its heavy dependence on import of metal scrap. A major share of metal scrap demand is served by imports owing to the underdeveloped metal scrap collection, segregation and processing infrastructure in the domestic market. The material recycling rates in India are well below global standards and is mostly conducted in the informal sector. Thus, strengthening material recycling, including metal recycling, under the formal sector can provide a good opportunity to cut down scrap imports.

8.37 At the core of an effective material recycling eco system is a systematic, organized and user-friendly collection, segregation and

sorting process. Strengthening this value chain by segregating waste at source and then channelizing the disaggregated scrap through a network of scrap pickers and collectors and eventually to the scrap recycler through appropriate policy interventions would earn rich dividends.

8.38 In this context, in FY 2020-21, Ministry of Mines has published National Non-ferrous Metal Scrap Recycling Framework, 2020 to promote a formal and well-organized recycling ecosystem by adopting energy efficient processes for recycling leading to lower carbon footprints and to work towards sustainable development and intergenerational equity. Major objectives of the framework include: to minimize the effect of end-of-life products on landfills and environmental pollution by promoting an environmentally sound processing and recycling system for secondary industry; to work towards economic wealth creation, job creation and increased contribution to GDP through metal recycling; to shift towards a circular economy in the coming years for base metals, critical raw materials and other essential materials, etc. The framework can be accessed at:

https://mines.gov.in/ writereaddata/UploadFile/ NFMScrapRecyclingFramework3.pdf





Corporate Social <u>Responsibility</u>

Annual Report 2020-21

147

Corporate Social Responsibility

Ministry of Mines

Corporate Social Responsibility

•	NALCO	Page - 149
•	HCL	Page - 152
•	MECL	Page - 152

Annual Report 2020-21

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 financial years as CSR fund as per Companies Act, 2013.
- Accordingly, for FY 2020-21, CSR expenditure of the company amounts to Rs. 2908.27 lakh till end December'2020 against mandated amount of Rs. 3342.00 lakhs.

9.2 Highlights on CSR activities for the financial year 2020-21 are furnished below:

i) Health Care:

(a) Initiative on COVID-19 Management:

Showing commitment and solidarity with the Nation and the home State where it has its operational facility in the fight against COVID 19 pandemic, NALCO donated Rs.7.6 crore to PM CARES Fund and Rs.2.6 crore to CM's Relief Fund, Odisha. The total contribution toward COVID-19 relief fund is Rs. 10.2 crores.

The Company has set up a 200 bedded exclusive COVID-19 hospital with 10 bedded ICU and oximetry along with 24hour diagnostic facility at Nabarangpur, Odisha in collaboration with Government of Odisha. This hospital is catering to the need of tribal dominated district of Nabarangpur and other adjoining districts of southern Odisha, viz Rayagada, Koraput, Malkangiri and Kalahandi. Till December, 2020 more than one thousand patients have been availed the treatment facility.

Apart from the above, two 50 bedded COVID-19 care centre were set up at S&P complex, Angul & M & R Complex, Damanjodi to facilitate treatment to the people of nearby villages of operational during this difficult time.

The infrastructure constructed for secondary care center at Angul is being used as COVID care centre.

Besides, mass awareness was created in the nearby operational areas at Angul, Koraput & Bhubaneswar with distribution of sanitizer & face mask. Food packet & dry rations were also distributed to the needy, migrated labours, COVID-19 warriors & marginal section of the society during the peak pandemic period.

(b) Other Health Care initiatives:

A 600 bedded Night Shelter is under construction to facilitate short stay for outdoor patients & attendants of Indoor patients at AIIMS, Bhubaneswar for people of Odisha & nearby states. Likely date of completion of the project is July, 2021.

(c) Primary Health Care service at door step:

During FY 2020-21 till 31st December, 2020, more than 50 thousand patients of peripheral villages of Angul, Damanjodi and Pottangi sector have given consultancies through 8 mobile health units & 1 OPD. More than 1.17 lakh patients were treated in FY 2019-20.

ii) Education:

Quality education have been provided to more than 5000 students of nearby villages of operational area in company aided School at Angul & Damanjodi.

(a) Indradhanush:

Under residential education program, till the academic year 2020-21, 1003 tribal students from Maoist dominated periphery villages of Koraput district sponsored in 3 reputed residential schools i.e. Kalinga Institute of Social Sciences (KISS), Bhubaneswar, Bikash Vidyalaya and Adarsha Vidyalaya, Koraput in Odisha. During the current Academic year, 544 students have been continuing their education in above three residential schools and 31 students are continuing higher education in ITI and +2 studies.

Apart from this, 31 students are continuing intermediate in different discipline & ITI after completing their School education.

(b) NALCO-ki-Ladli:

Financial support has been extended to 603 meritorious girl students of BPL category till FY 2020-21 under **'Beti Bachao Beti Padhao'** programme, initiated by Government of India.

The Company launched an innovative Employee Social Responsibility (ESR) programme on 1st January, 2019 that offer employees a satisfying way to meaningfully contribute towards social causes by way of contributing Rs. 3,000 each towards education of girl child under this scheme. The Company will match with equal grant for the same.

(c) Doubt Clearing Classes and support to Students in Lockdown Period:

Doubt clearing classes were conducted in the pandemic period by interacting with students and their parents. Also, Officers and employees of the company contributed their skill, knowledge and time after their duty period in clearing doubts of students and encouraging them in studies.

(d) Encouragement to Meritorious Students:

Twenty-three meritorious students from Company funded residential Schools were felicitated on their successful results in HSC Exams.

(iii) Safe Drinking Water & Sanitation:

(a) Drinking water Supply:

In summer, water supply through tankers has been made to 26 water scarce periphery villagers of S&P complex, Angul.

Besides, uninterrupted pipe water supply projects were taken up for 11 fluoride affected villages of S&P complex and to a village Girang adjacent to CPP, Angul.

(b) ODF Village:

Construction of individual household latrines in 5 villages of S&P Complex, Angul has been taken up out of which, 2 villages have been made ODF and in the rest three villages the work is in progress. Till Dec. 2020, 313 units has been completed out of the targeted 539 toilets.

(iv) Rural infrastructure building:

Construction of roads, culverts, drains,

shelter homes, renovation and revamping of community centres and water bodies in the periphery areas has been taken up by the Company.

(v) Promotion of Livelihood Program:

30 Self Help Group (SHG) were encouraged for strengthening & initiating new livelihood activities in Pottangi periphery areas of M&R Complex. Keeping aim to develop employability and generation of livelihood SHGs were facilitated to mobilize resources to initiate livelihood activities.7 SHGs have been facilitated to avail loan from bank and OLM to initiate livelihood activities like, carrot, millet cultivation, mushroom, fish and poultry farming. Ginger cleaning through machine is now under mobilization through the SHGs. The renovation of pond has been made in Kasuguda of M&R complex. The development of this pond has been made in order to enable people to cultivate fish and generate income.

Besides above, a wide number of SHG meetings were conducted for strengthening & initiating of new livelihood activities in Pottangi periphery. Two SHGs have started making vegetable pickle and broomstick. Two SHGs from Nuagaon and Geluguda village of M&R complex came forward and succeeded in mobilizing a Mushroom Spawn making with the facilitation at Damanjodi.

9.3 Training & Development

In order to enhance the functional and behavioral competency of its employees and to align the individual need with the business objective of the organization towards increasing production and productivity as well as to improve business culture in the organization, there has been an unstinting effort by your Company to impart skill and behavioral training to its employees. In its commitment for corporate social accountability and good corporate governance, the company also imparts skill development training to contract workers, apprentices, students from managerial and technical institutes as well as for local populations.

As regards regular employees, the Company has imparted training to 2986 employees with 3290.5 training man-days during the year 2020-21(upto December 2020) in spite of the Covid pandemic lockdown scenario existing during first & second guarter of FY 2020-21. Further, 12 executives were given virtual training from MDI (Murshidabad) and ASCI on management development programme during 2019-20 during Covid pandemic scenario. There were 556 apprentice trainees were engaged during the year 2020-21(upto December 2020) which is 9.43% of employees (i.e. employee strength is 5893) of the company. As a part of corporate responsibility and industry academic interface, 20 students from different technical and management institutes across the country had undergone summer internship programme in various functional disciplines at corporate office during the pandemic through virtual mode. The company has also given IGOT training as part of capacity development exercise in the company and during the initial stage of Covid pandemic. The employees, medical staff and practitioners were trained in IGOT module available in the diksha.gov.in platform. In total 1668 number of employees in the company have been imparted IGOT training.

9.4 For other details of CSR activities done by NALCO, refer:

https://nalcoindia.com/corporate-socialresponsibility/about-csr/annual-reports/.



Hindustan Copper Limited (HCL)

9.5 Hindustan Copper Limited's **(HCL's)** Corporate Social Responsibility (**CSR**) Policy revolves round the principles laid down in the Sustainable Development Goals (**SDGs**), Companies Act, 2013, Company (Corporate Social Responsibility) Rules, 2014 and Department of Public Enterprise Guidelines on CSR.

9.6 The actual expenditure on the CSR activities during last two financial years and current financial year is given in the table below.

CSR expenditure during last two financial years and current financial year

Financial Years	Required Spent (2 % of average net profit (PBT) of last three FYs)	Spent
2018-19	170.33	208.16
2019-20	297.26	331.01
2020-21	*	22 #

(Rs. in lakhs)

#As on 31.12.2020

*HCL is not required to spend 2%, as average profit during last three years [FY2017-18, 2018-19 & 2019-20] is negative.

9.7 For FY 2020-21, an amount of Rs 88.90 Lakhs inclusive of carry forward [the unspent amount of Rs 14.58 Lakhs of FY 2019-20] has been allocated for CSR Projects. The allocation has been done for important ongoing projects having direct impact on communities around company's operation. Major projects planned are as under.

- 1. Drinking Water and Health Camps
- 2. School Repair, Vocational Skills and Livelihoods.
- 3. Plantation and Sports

152

4. Biennial Third-Party Impact Assessment.

The projects are being implemented in the target communities with the help of NGO, state government and other agencies.

9.8 For other details of CSR activities done by HCL, refer: https://www.hindustancopper.

Mineral Exploration Corporation Limited (MECL):

9.9 MECL has drawn a long term Corporate Social Responsibility (CSR) Policy.

9.10 During the period January to December, 2020 (FY 2020-21), an amount of Rs.309.74 Lakhs have been spent under CSR. The details of CSR programmes under progress are given below:

9.11 Promoting Sanitation & Safe drinking water:

Installation of water purifier-cum-coolers near exploration project sites/zonal offices of MECL in the districts of Hyderabad, Shahdol, Bikaner, Nagaur, West Godavari, Sundergarh, Raigarh, Dhanbad, Surguja, Balrampur, East Singhbhum, Bolangir, Ranchi, Singrauli, Korba and Nagpur.

9.12 Promoting Healthcare

- a. Providing additional equipment for Ambulance donated under CSR FY 2019-20 to Shri Adinath Samiti, Jabalpur, M.P.
- Providing Medical Equipment viz.
 Posterior Vitrectomy- Galaxy Turbo Orbit to Mahatme Hospital, Nagpur

9.13 Promoting Education

a. Annie Learning Devices for the visually impaired –provided at Blind Relief Association, Nagpur.

 Implementation of learning management and school management system by NGO Pragya Social Organisation at Government School at Raigarh, Chhattisgarh.

9.14 Promoting Women Empowerment

- a. Provided financial assistance for running of Sewing Training Centre for Imparting Tailoring Skill for poor women at Mahakaushal, Jabalpur, M.P
- b. Provided Honorarium to teachers for Skill Development, thereby improving the quality of education at Residential Tribal School, Kosumdhih, Dindori, M.P
- c. Distribution of Sewing Machines for vocational training of girls / women near MECL's corporate office, Nagpur

9.15 Promoting Rural Development

Solar Water Pumps are being provided to the remotest parts of the country where our projects are functioning, such as at Kolar (Karnataka), Vadodara (Gujarat), Nagaon (Assam), West Godavari (A.P.), Koriya and Korba Districts (Chhattisgarh).

9.16 Skill Development

An MoU has been signed between MECL and Centurion University of Technology and Management (CUTM), Odisha, Centre of Excellence for "Skilling and Training of 50 Nos. disabled persons (Hearing and Speech Impaired)".

9.17 PM CARE Fund / COVID-19 related CSR Activities

- a. MECL has contributed an amount of Rs. 200.00 Lakhs to the PM CARE Fund, for FY 2020-21.
- Masks and Sanitizers have been provided for use by heath care professionals for fighting against COVID-19.
- c. Ration /Food Packets distributed to the poor and needy persons, in and around our various project's sites and Corporate Office during the Lockdown period due to COVID-19.
- Supported Chakr Foundation (under Indian Institute of Technology (IIT), Delhi) in development of the "COVID Shield"-PPE Sanitization Technology for personal protective equipment (PPE).



Iron Ore Mining Operation

Annual Report 2020-21

$\mathbf{10}$

<u>Progressive Use of</u> <u>Hindi</u>

Annual Report 2020-21

155

Progressive Use of Hindi

•	Hindi Salahkar Samiti	Page - 157
•	Official Language Implementation Committee	Page - 157
•	Town Official Language Implementation Committee	Page - 157
•	Official Language Inspections	Page - 158
•	Inspection by Committee of Parliament on Official Language	Page - 158
•	Measures for Implementation of Official Language Policy	Page - 158
•	Training, Workshops and Seminars	Page - 159
•	Organization of Rajbhasha Fortnight/Month	Page - 159
•	Translation Work	Page - 160
•	In-house magazines	Page - 160
•	Special initiatives taken by PSUs for promoting use of Hindi in Official work	Page - 160

Introduction

10.1 The Ministry of Mines continues to take steps to ensure compliance of the Official Language Policy of the Government of India in the Ministry of Mines as well as in its attached / subordinate offices and PSUs. The compliance of Section 3(3) of the Official Languages Act, 1963 is ensured. As per rule 5 of Official Languages Rules, 1976, during the year out of the 905 letters received in Hindi (up to Dec. 2020), 171 letters were for information only and reply was not required and remaining 734 letters were replied to in Hindi.

Hindi Salahkar Samiti

10.2 After the expiry of the tenure of the erstwhile Hindi Salahkar Samiti of the Ministry of Mines and formation of the XVII Lok Sabha, the process for reconstitution of Hindi Salahkar Samiti is in progress. Out of the 15 non-official members to be nominated in the Samiti, nominations of 02 members (Member of Parliament) by the Committee of Parliament on Official Language and nomination of 01 non-official member by Rashtrabhasha Prachar Samiti, Wardha have been received. The draft resolution for reconstitution of Hindi Salahkar Samiti and the nomination of three non-official members from MHA is awaited.

Official Language Implementation Committee

10.3 The Official Language Implementation Committee (**OLIC**) has been constituted in the Ministry under the Chairmanship of Economic Advisor. Meetings of the committee were held on 29.09.2020 and 23.12.2020 during the year (upto Dec. 2020). Progress of usage of Hindi in official work in different sections of the Ministry was reviewed and Officers representing different divisions/sections were asked to increase correspondence in Hindi with Offices located in region 'A' and region 'B' and officials who are proficient in Hindi should increase the usage of Hindi in noting / drafting to achieve the targets fixed by Department of Official Language in Annual Programme for the year 2020-21.

10.4 Similarly, meetings of the OLIC in Geological Survey of India (**GSI**), Central Headquarters, Kolkata were held on 27.07.2020 and 17.12.2020. The proposed meeting of OLIC of March 2020 was postponed under the guidelines related to Covid-19. Beside these meetings, GSI reviewed Quarterly Progressive Reports of all regions and Missions through video conferencing on 24.02.2020, 17.07.2020 and 01.12.2020.

10.5 Indian Bureau of Mines (**IBM**) held the 113^{th,} 114th, 115th and 116th meetings of the Departmental Official Language Implementation Committee on 23.03.2020, 29.06.2020, 30.09.2020 and 01.01.2021 respectively. In all regional offices, the meetings of the Departmental Official Language Implementation Committee are regularly held and reports are sent to the headquarters.

10.6 National Aluminium Company Ltd. (NALCO) and Hindustan Copper Limited (HCL) also held OLIC meeting to review the progress of Hindi in official work in their respective offices.

TownOfficialLanguageImplementation Committee

10.7 As per the directions issued by the Department of Official Language, Ministry

of Home Affairs, Town Official Language Implementation Committee (**TOLIC**) is constituted in every town having 10 or more central government offices.

10.8 GSI, Central Headquarters, Kolkata is nominated as Head of Town Official Language Implementation Committee, Kolkata and the Director General, GSI is ex-officio Chairman of this Committee. The half-yearly meeting of the Committee was held on 17.12.2020 under the chairmanship of the Director General, GSI, in which half-yearly Hindi reports from January to June 2020 were reviewed.

10.9 Half yearly meeting of TOLIC (Undertaking), Bhubaneswar was held on 28th September 2020 under the chairmanship of CMD, National Aluminium Company Limited (**NALCO**) through online mode. Half yearly meeting of TOLIC (Undertaking), Angul was held on 27th Nov. 2020 under the chairmanship of Executive Director (S&P), NALCO.

10.10 Nomination of participants from Hindustan Copper Limited (**HCL**) was ensured for various competitions organized by various undertakings for promotion of Official Language under the aegis of TOLIC.

Official Language Inspections

10.11 As per annual programme of Department of Official Language, Ministry of Home Affairs for the year 2020-21, Ministries / Departments are required to conduct official language inspection of minimum 25% of offices located outside Headquarters. However, the Ministry couldn't conduct any such inspection during the year 2020-21 due to COVID pandemic.

10.12 GSI, Central Headquarter, Kolkata undertaken official language inspection of

09 sub-ordinate offices. Besides, Regional Headquarters also conducted official language inspection of their respective State Units and Operational Offices.

10.13 Similarly, IBM Headquarters, Nagpur also conducted official language inspection of its various Divisions and Sections. Inspection reports were sent to the concerned Divisions and Sections for taking appropriate actions. Further, official language inspections were also carried out by IBM in Raipur and Bhubaneswar Regional Offices on 24.01.2020 and 27.01.2020 respectively.

Inspection by Committee of Parliament on Official Language

10.14 The Committee of Parliament on Official Language visited GSI's Director General Camp Office at New Delhi on 05.10.2020. Officers representing Ministry of Mines in the above inspections held a briefing meeting with Head of the Office and officers attending inspection meeting. While appreciating the status of correspondence in Hindi in this office, the Committee suggested some measures to improve the usage of Hindi in other areas of official work. Necessary action on assurances given to the Committee is to be taken by concerned Office.

Measures for implementation of Official Language Policy

10.15 During the year 2020-21, besides various incentive Schemes of the Department of Official Language, measures taken for implementation of Official Language Policy includes training, workshops, seminars, organization of Hindi week / fortnight / month and publication of in-house magazines which are detailed below:

Training, Workshops and Seminars

10.16 To provide Hindi training to all personnel of GSI within the time-limit prescribed by the Department of Official Language, Ministry of Home Affairs, officials are being nominated for Prabodh, Praveen, Pragya and Parangat classes under Hindi Teaching Scheme. These classes are held twice a year i.e. from January to May and from July to November. In addition, intensive training classes for Hindi language training are also being organized and typists and stenographers are being nominated in a phased manner for Hindi typing and stenography training.

10.17 The offices of GSI are organizing Hindi Workshop on regular basis to encourage employees to perform their official work in Hindi. Accordingly, a Hindi workshop was organized at GSI, Central Headquarter, Kolkata for the officials of Personnel and Administration Branch on 28.02.2020. Another, online Hindi workshop on Hindi Typing on Computer was organized during Hindi Week on 11.09.2019.

10.18 IBM Headquarters, Nagpur organized full-day Hindi Workshops on 17.03.2020, 25.09.2020 and 15.12.2020 in which 25, 20 and 22 officials participated respectively. In the same manner, following Hindi Workshops were also organized in different regional offices of IBM as per details given below:

- in Hyderabad Regional Office on 10.02.2020 and 11.02.2020.
- in Ajmer Regional Office on 30.06.2020;
- in Guwahati Regional Office on 18.08.2020;
- in Dehradun Regional Office on 25.08.2020;

- in Kolkata Zonal office on 14.09.2020 and 15.09.2020;
- in Ajmer Ore Dressing Laboratory on 29.09.2020;
- in Bhubaneswar Regional Office on 29.09.2020;
- in Gandhinagar Regional Office on 29.09.2020 and 30.09.2020;
- in Ranchi Regional Office on 30.09.2020; and
- in Ore Dressing Laboratory, Hingna, Nagpur on 20.11.2020.

10.19 NALCO organized 6 Hindi Workshops to enable officers and employees for doing official work in Hindi, including a workshop organized on 01.09.2020 2020 at the office of the Chairman (TOLIC), Bhubaneswar to introduce '*Kanthastha*' tool to official language staffs working in member offices.

10.20 During the year 2020-21, two online Hindi Workshops were conducted by Mineral Exploration Corporation Ltd. (MECL). HCL also organized a Hindi Workshop during this period.

Organization of Rajbhasha Fortnight / Month

10.21 Ministry of Mines observed Rajbhasha Hindi Prayog Protsahan Month from 1st to 30th September, 2020. A message by Hon'ble Minister of Mines, Shri Pralhad Joshi, was circulated on the occasion of 'Hindi Diwas' on 14.09.2020. Various competitions i.e. Hindi Noting / Drafting competition, Hindi Sulekh and Dictation, Quiz Competition, Hindi typing and extempore speech competition were organized during the month. As many

as 47 officials, who were winners in the competitions, were given away cash awards.

10.22 Hindi fortnight/week/day were also celebrated during the month of September, 2020 in the offices of GSI, IBM, NALCO, HCL, MECL, JNARDDC and NIRM to encourage the use of Hindi in official work. During this period, various Hindi competitions / activities i.e. Hindi Typing, Hindi Essay Writing, Hindi Noting and Drafting, Hindi Extempore Speech, Hindi Poetry Recitation, Hindi Translation, Hindi Quiz, Debate, etc. were organized. Prizes were distributed to the winners of these competitions.

Translation Work

10.23 Translation works relating to meetings of Standing Committee, Audit Paras, Cabinet Notes, Annual Report, Parliament Questions, material relating to Demand for Grants, MoUs for International Cooperation in the field of Mines and Minerals with various countries, etc. were carried out during the year. Against around 3,52,729 words translated in 2019-20, during the year 2020-2021 (upto Dec. 2020) around 2,45,732 words were translated in Hindi, excluding routine translation work.

10.24 GSI, Central Headquarters, Kolkata translated abstracts of reports related to various survey programs of the GSI into Hindi in addition to the routine translation work.

10.25 IBM Nagpur translated various technical and administrative documents into Hindi, in addition to the routine translation work.

In-House Magazines

10.26 In-House Hindi magazines namely 'BHOOGAURAV' 19th edition of GSI, WR, Jaipur; 'NARMADA' 11th edition of CR,

Nagpur; 'CHETANA' 20th edition of GSITI, Hyderabad; 'VIHANG' 10th edition of RSAS, Bangalore; 'TAVI' 2nd edition of SU: Jammu & Kashmir; 'ADWIKA' 1st edition of SU: Andhra Pradesh, Hyderabad and 'PARAS' 4th edition of SU: Jharkhand, Ranchi were published during this period.

10.27 Further, in-House Hindi magazines viz. 'Khan-Bharti' of IBM (available at https://ibm.gov.in/writereaddata/files/ 10202020105536Khan%20Bharti%20 2020.pdf)

'Akshar' of NALCO (available at https:// nalcoindia.com/wp-content/ uploads/2020/09/Akshar-Magazine-July-2020.pdf)



and 'Tamralipi' of HCL (available at https:// www.hindustancopper.com/Content/PDF/ Tamralipi_Hindi.pdf) were published.



10.28 Along with that, monthly e-news related to the GSI Training Institute, a compilation of activities related to Bhuvisamvad project, training calendar and course material on geology for the Chemist and course material on remote sensing and digital image processing was published in official language Hindi.

Special initiative taken by Attached/ Sub-ordinate Offices and PSUs of the Ministry for promoting use of Hindi in Official Work

10.29 Implementation of Hindi Incentive Schemes in Geological Survey of India (GSI): To promote the use of Hindi in the Official work, the following Incentive schemes are being implemented in GSI:

• Cash Award and Personal Pay to the officers and employees for passing the

Pragya, 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 and employees for noting and drafting in Hindi;
- Officers and employees, who have made outstanding contributions for the propagation of Official Language Hindi are honored on Hindi Day.

Further, 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 under progress.

10.30 Award for Original Noting and Drafting Hindi Encouragement Plan by Indian Bureau of Mines (IBM): Under the Original Noting and Drafting Hindi Encouragement Plan, 61 persons of 14 Offices of IBM were awarded.

10.31 National Aluminium Company Limited (NALCO)

- Under the Hindi Teaching Scheme of the Government of India, 25 employees have passed the Pragya / Praveen course examination in May and November 2020 session.
- Faculty assistance on Unicode and tools and techniques of Hindi computing was provided to the member offices of TOLIC (Undertaking), Bhubaneswar.
- The website of the Company is being regularly updated in bilingual viz. Hindi and English.

• As an initiative to create awareness among the employees to use Hindi in their routine official work, the names and designations of all the employees have been uploaded in bilingual form in E-office.

10.32 Hindustan Copper Limited (HCL)

- The progressive use of Hindi is being reviewed regularly at the Board meetings of Company.
- The Company's in-house journal "Tamralipi" published in Hindi is distributed among employees regularly.
- Advertisements of company recruitment/ tender, etc. are published in bilingual.
- *"One Hindi Word Every Day"* scheme is operational for improving the Hindi vocabulary of employees.
- At the time of superannuation, all the employees are given Service Certificate in Hindi.
- Copies of "Mineral and Mining Vocabulary" and copies of the Book titled "Rashtriya Chetna and Swablamban" were distributed in the HCL's Corporate Office and its Units.

10.33 Mineral Exploration Company Limited (MECL)

- As per the orders of Ministry of Home Affairs, Rajbhasha Vibhag, Unicode Encoding "Smarthit' font has been installed in all computers / Laptops also in MECL, so that more officials are able to work in Hindi due to its easy functionality.
- In order to encourage employees to do official work in Hindi, 102 cash awards were given to employees during the year (till December, 2020).

- In addition, 'Mec Samachar' and internal news-letter of MECL has been published in Hindi only.
- MEC Samachar has been awarded the 1st prize by Nagar Rajbhasha Karyanvayan

Samiti-I (NARAKAS-I).

• MECL also received the consolation prize for incorporation of Hindi as the working language at the corporate office.



Photo 10.1: Team MECL receiving 1st Prize for MEC Samachar

Exploration Activities in the North-Eastern Region

Annual Report 2020-21

163

11

Exploration Activities in the North-Eastern Region

Ministry of Mines

Exploration Activities in the North-Eastern Region

•	Exploration Activities in the North-Eastern Region	Page - 165
•	Landslide hazard studies	Page - 169
•	Work done by IBM in North-Eastern Region	Page - 171
•	Work Carried Out by MECL in North Eastern Region	Page - 172

Annual Report 2020-21

164

Exploration Activities in the North-Eastern Region

Exploration Activities in the North-Eastern Region

Introduction

11.1 The North Eastern Region (NER) 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.

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

11.2 The major activities of North Easter Region (**NER**), Geological Survey of India (**GSI**) include baseline data generation through geological, geochemical & geophysical mapping, mineral exploration, compilation and generation of different types of maps and publications, fundamental researches & societal works like landslide/ geotechnical/ earthquake studies. GSI is continually striving for the development of NER states through augmentation of above activities and helping the states of NER in

training, capacity building by providing free courses to a number of officers of State DGMs of NER. GSI NER provided technical and scientific assistance by arranging very high-end instrument analyses like EPMA (Electron Probe Micro-Analyzer) and SEM (Scanning Electron Microscopy) of the representative samples of the DGMs.

Geological Mapping on 1:25,000 scale

11.3 During FS 2019-20, a total of six items of Geological Mapping including two Research Projects (RP) and one Integrated Thematic Mapping (ITM) items were taken up in NER of which one project was taken up in Arunachal Pradesh, two in Assam and three in Meghalaya. A total of an area of about 397 sq. km and 86 Line km (RP) have been covered during the period from 1st January, 2020 to 31st March, 2020.

11.4 During FS 2020-21, a total of twelve items of Geological Mapping on 1:25,000 scale including two RP items have been taken up in NER of which two items are taken up in Arunachal Pradesh, four in Assam, two in Manipur-Nagaland, three in Meghalaya and one in Sikkim. During the period from 1st April, 2020 to 31st December, 2020, an area of 715 sq. km and 58 Line km in RP items have been covered (**Annexure 11.1**).



Photo 11.1: Carbonized leaf impression (Swintonia sp.) Kimin Formation. (Loc. - Kuria Nala, Arunachal Pradesh)

Photo 11.2: Mylonitized mafic gneiss associated with Daling Group of rocks (Loc. - near Gangtok, East Sikkim District, Sikkim)

Geochemical Mapping

11.5 Geochemical Mapping (**GCM**) is carried out by GSI in different parts of NER to generate baseline regional geochemical data with elemental distribution for targeting areas for search for mineral deposits and detailed studies on the societal concerns viz. environmental, agricultural and human health.

11.6 A total of three items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern have been taken up during the FS 2019-20 in parts of Arunachal Pradesh and Manipur and an area of 1263 sq. km has been covered during the period from 1st January, 2020 to 31st March, 2020.

11.7 Total 10 items of Geochemical Mapping on 1:50,000 scale with collection of samples in grid pattern have been taken up during the FS 2020-21 in parts of Arunachal Pradesh, Assam, Manipur, Meghalaya and Tripura and an area of 1982 sq. km has been covered during 1st April, 2020 to 31st December, 2020 (Annexure 11.2).

Geophysical Mapping

11.8 Geophysical Mapping (**GPM**) is taken up with an objective to prepare gravity magnetic anomaly maps so as to delineate sub surface geological structures. These studies along with the geological and geochemical maps help in postulating conceptual models to focus on potential/ probable target areas of interest for mineral exploration in deep as well as shallow levels. Two items of GPM in Ri Bhoi, East Khasi Hills and West Khasi Hills districts of Meghalaya, and Nagaon, Morigaon and Karbi Anglong districts of Assam have been taken up during FS 2019-20 an area of 2310 sq. km have been covered during the period from 1st January, 2020 to 31st March, 2020.

11.9 Two GPM items in South Garo Hills, North Garo Hills, West Khasi Hills and South West Khasi Hills districts of Meghalaya and Goalpara, district of Assam has been taken up during FS 2020-21 and an area of 400 sq. km have been covered during the period from 1st April, 2020 to 31st December, 2020 (**Annexure 11.3**).

Photo Geology and Remote Sensing

11.10 One item of Photo Geology and Remote Sensing (**PGRS**) is taken up on 1:50,000 Scale during FS 2020-21 in parts of Meghalaya and an area of 1400 sq. km has been covered during the period from 1st April, 2020 to 31st December, 2020 (**Annexure 11.4**).

Mineral Exploration in NER

11.11 Mineral Exploration in NER includes exploration of minerals like Gold, basemetal, Graphite, Vanadium, Molybdenum, Iron, REE, Tungsten, Lateritic Bauxite, Chromium, Nickel, PGE, Coal, Shale gas and Limestone carried out through Large Scale Mapping on 1:12,500 scale (LSM), Detailed Mapping on 1:1000/5000 scale (DM) and Drilling. During FS 2019-20, a total of thirty-two items (4 G2, 8 G3, 19 G4 and 1 Regional Mineral Targeting Item) have been taken up in the states of Arunachal Pradesh, Assam, Meghalaya, Manipur, Sikkim and Nagaland. During the period from 1st January 2020 to 31st March 2020, an area of 319.7 sq. km. of LSM, 11.36 sq. km. of DM and 3051.35 m of Drilling were carried out. During FS: 2020-21, a total of 20 mineral investigation items (5 G-3, 14 G-4 stage, 1 Regional Mineral Targeting Item) were taken up in the States of Arunachal Pradesh, Assam, Meghalaya, Sikkim, Nagaland and Manipur. During the period from 1st April, 2020 to 31st December, 2020, an area of



Photo 11.3: Nodular chromitite grading into massive steel black chromitite occurring as lenses within cumulate peridoite (Location: Namjet Lok section. Tengnoupal District, Manipur)

196.9 sq. km. has been covered by large scale geological mapping (1:12,500 scale) and 1.32 sq.km. by detailed mapping. Total 1398.25 m drilling has been done during the period from 1st April, 2020 to 31st December, 2020 (Annexure 11.5).

Publications

11.12 During FS 2020-21, the following items on Publications have been taken up:

- Limestone deposit of Litang Valley, Jaintia Hills District, Meghalaya, Vol-I (2nd edition): Bulletin Series - A, No-63.
- Publication of GSI Records, Vol. 154, Part 4, Extended Abstracts of Progress Reports for FS: 2019-20 of North Eastern India.
- Manual of Geology of India, Special Publication No. 77, Volume III: Economic Geology of North Eastern India.
- Preparation and compilation of mineral belt map of sillimanite in Sonapahar and its adjacent areas, West Khasi Hills and East Garo hills districts, Meghalaya.
- Preparation of Geological Quadrangle Map of Degree sheets 82K, 82H.



Photo 11.4: Pods of massive steel black chromitite within transitional peridotite showing highly fracture nature with highly serpentinised matrix filling the microfracture planes. (Location: South east of Kwatha Village. Tengnoupal District, Manipur)

- Preparation of Geological Quadrangle Map of Degree sheets 831, 83E.
- Compilation of District Resources Map of Chandel, Churachandpur, Pherzawl and Tengnoupal Districts, Manipur on 1:250,000 Scale.



Photo 11.5: Invertebrate fossils from the Mahadek Formation, Khasi Group from South West Khasi Hills, Meghalaya

Research and Development

Petrological Studies

11.13 Two Research items have been taken up as (a) Comprehensive petrological, petrochemical and geochronological studies of the Abor & Lichi Volcanics of Arunachal Himalaya to understand their significance in the tectonic evolution of North Eastern India and (b) Petrological characterization and petrogenesis of Chromite and associated ultramafic rocks of ophiolite in Manipur.

Paleontological Studies

11.14 During FS 2020-21, two Research items have been taken up (a) Faunal diversity and palaeoenvironment of the Upper Cretaceous Mahadek Formation of Meghalaya plateau and (b) Palaeontological studies of Oceanic Pelagic sediments, Disang and Barail Group sediments in Ukhrul and Chandel Districts of Manipur and its implication on constraining the stratigraphic age.



Photo 11.6: Echinoid rich sandstone of the Mahadek Formation, East Khasi Hills, Meghalaya

Geotechnical Investigations

11.15 NER may be termed as the 'power house' of India as it possesses hydropower potential, which is 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.



Photo 11.7: Active Landslide area in Nutan-Leikul Kelelo road stretch, NH-54E, Dima Hasao District, Assam
Exploration Activities in the North-Eastern Region

Ministry of Mines

11.16 GSI, NER is intimately associated with the development of hydel power in NER 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 Tunnel, Gangtok-Sherathang-Nathula Highway (JNM Road) and Jiribam-Imphal Broad Guage Railway Line (NFR).

11.17 During the current FS 2020-21, Engineering Geology Division, GSI, NER, Shillong has taken up 5 DPR stage Geotechnical Investigation of Katakhal Irrigation Project, Cachar District, Assam, Myntdu-leshka stageII Hydroelectric Project, West Jaintia Hills District, Meghalaya, Umngot Hydroelectric project, East Khasi Hills and West Jaintia Hills District, Meghalaya, Haora and Champaicherra Irrigation Project, West Tripura District, Tripura and Selim H.E. Project, Meghalaya along with one Feasibility stage geotechnical investigation of Umngi Hydroelectric project, East Khasi Hills District, Meghalaya.

Landslide Hazard Studies

11.18 In North-Eastern Region, during FS 2020-21, Six National Landslide Susceptibility Mapping (NLSM) items, eight Meso scale Landslide Susceptibility Mapping items and three Site Specific landslide studies are being taken up out of which eight items have been taken up on the request of State Government.



Photo 11.9: Debris slide on Tikchek-Dentam road, West Sikkim District, Sikkim

Earthquake Studies

11.19 Two regular items have been taken up in NER on seismic and earthquake studies in FS 2020-21 on the request of the State government of Arunachal Pradesh and Assam. The Seismic Microzonation of two cities Pashighat and Silchar 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.

Environmental Geology

11.20 In FS 2020-21, five projects have been taken up on environmental Geology. The items are:

Geo-environmental hazard study of flood

and erosion-prone river banks areas in Majuli River Island of Brahmaputra River in Assam.

- Chemical, Mineralogical and lead isotopic characterization of road dust of Guwahati city in different seasons.
- Geo-environmental appraisal of Haora River Basin, Tripura.
- Geo-environmental appraisal to ascertain the impact of erosion caused by the Gumti River along Dumboor, Kurmachhara Amarpur, Udaipur, Telkajila and Sonamura subdivisions of Tripura.
- Geo-environmental studies to constrain the extent of arsenic, fluoride and other associated heavy metal contamination in water around Dimapur and Kohima city, Nagaland



Photo 11.8: Deep translational debris slide, 1km West of Chelep, Tengnoupal District, Manipur

11.21 Budget and expenditure of the North Eastern Region for the Financial Year 2020-21 is given in **Table11.1**.

Table	11	.1
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(Rs. In Lakh)

		Allocation for	Actual expenditure
SI. No.	Name of GSI Mission / Activity	NER in BE/RE (2020-21)	in NER (2020-21 up to Dec 20)
1	Survey & Mapping Scheme (Mission-I)	80.00	35.51
2	Mineral Exploration Scheme (Mission-II)	363.85	323.19
3	Information Dissemination Scheme (Mission-III)	60.00	41.96
5	Research & Development Scheme (Mission-IV)	103.00	58.38
6	Human Resource Development Scheme (Mission-V)	1.54	1.38
7	Special Component Plan for Schedule Caste (SCSP)	-	-
8	Tribal Area Sub Plan Scheme (TSP)	135.00	113.07
9	Administrative Support Activity including minor works authorization to MoUD	7034.60	5510.66
10	Total Revenue	7777.99	6084.15
11	Modernisation & Replacement Scheme (MV and M&E)	291	39.82
	Grand Total (Rev + Capital)	8068.99	6123.97

Indian Bureau of Mines

Work done by Indian Bureau of Mines in North Eastern Region

11.22 The Regional Office of Indian Bureau of Mines (**IBM**) at Guwahati continued to undertake inspection of mines and studies on

development of resources in North-Eastern Region. During the year 2020 (1st January to 31st December 2020), 21 nos. of inspections were carried out for enforcement of provisions of MCDR, 2017 and for processing and disposal of mining plan/scheme of mining. The details of inspections, results and follow up actions thereof are given below:-

Parameter	Details
	Total - 21 Nos.
No. of inspections	MCDR– 10 Nos.
	MP/RoMP/FMCP- 09 Nos.
	Check-up/ Others– 02 Nos.
No. of violations issued	15 Nos.
	7 Nos.
No. of rules violated	[Rule 11(1), 11(4), 24(1), 26(2), 33, 35(2) & 45(5) of MCDR 2017]
No. of show cause notices issued	31 Nos. (incl. notices issued on the basis of office scrutiny)
No. of mines where violations not complied	9 Nos.
even after issue of show cause notice	(In process of its compliance) - 10 Nos.
Action taken:	
Court case –	9 Nos.
Suspension –	9 Nos.

Mineral Exploration Corporation Limited (MECL)

Work Carried Out by MECL in North Eastern Region

11.23 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 projects 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 Khasi Hill district.

11.24 On behalf of Directorate General of Hydrocarbon, Government 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. A total of 932 million tonnes of Oil Shale deposit have been established in the study area.

11.25 MECL is keen for development of North Eastern States. Hence with focus on North Eastern Region to augment exploration, MECL has signed MoU with Government of Assam and taken exploration for Coal in Khotarda block, Mikir hills district is under progress.

11.26 Discussions are under progress with Government of Meghalaya and Arunachal Pradesh for signing of MoU. Draft MoU has been sent to the respective State Governments and it is under consideration at their level.

WelfareActivitiesforSCs/STs,Women,Minorities&PersonswithDisabilities

Ministry of Mines

Welfare Activities for SCs/STs, Women, Minorities & Persons with Disabilities

Annual Report 2020-21

173

12

Welfare Activities for SCs/STs, Women, Minorities & Persons with Disabilities

Welfare Activities for SCs/ STs, Women, Minorities & Persons with Disabilities

•	Ministry of Mines	Page - 175
•	NALCO	Page - 175
•	HCL	Page - 177
•	MECL	. Page –179
•	IBM	Page - 180
•	JNARDDC	Page - 180
•	NIRM	Page - 180

174

WelfareActivitiesforSCs/STs,Women,Minorities&PersonswithDisabilities

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.

Women's Welfare

12.3 A complaint committee has been constituted to look into cases of sexual harassment of women at work place.

12.4 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.

12.5 The Geological Survey of India (**GSI**), an attached office of Ministry of Mines, and Indian Bureau of Mines (**IBM**), a subordinate office under Ministry of Mines, have also undertaken a number of activities for the welfare of Scheduled Caste (**SC**) / Scheduled

Tribe (**ST**), Other Backword Class (**OBC**), persons with disabilities (**PwD**) and other weaker sections of the Society.

12.6 Measures were undertaken for officials belongs 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 Government of India/MoM/ DoPT from time to time. Reservation has been followed strictly in case of their employment/ promotion, wherever applicable.

12.7 SC/ST cell has already been established in GSI's Headquarters as well as in the respective GSI's Regional offices under supervision of the Liaison Officer to address difficulties faced by these communities and also to initiate appropriate measures for resolving their issues.

12.8 The total strength of employees in the Ministry, GSI and IBM and the representation of SC/ST/OBC and other weaker sections during the year 2020 is given at **Table 1.1**, **Table 6.1** and **Table 6.8** respectively.

National Aluminium Company Limited (NALCO)

12.9 Welfare of activities for SCs/STs, Women, Economically Weaker Section (EWS), 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.
- 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-imbursement 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 has 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.

Minority Welfare

12.10 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' posts.

The Persons with Disability (PWDs)

12.11 The Company has been making efforts to achieve representation of PWDs (Divyangs) in all posts in Group: A, B andC 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 31st December, 2020, there are 88 Persons with Disability in employment of the Company in various identified posts. An 'Equal Opportunity Policy' as required under the Act has been formulated and the same has been widely circulated in addition to webhosting. The different facilities/establishments of the Company have been made accessible as required under the Rights of Persons with Disabilities Act, 2016 and the 'Accessible India' campaign. However, these are being constantly monitored to bring about further improvement in the facilities.

Perspective Plan for Women Welfare

12.12 The Company has adopted the principle of equal opportunity to the women employees in the matter of employment and the Company as on 31st December, 2020 has 347 nos. of women employees at different levels and categories.

12.13 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.

Manpower Strength in NALCO

12.14 Employment of SC/ST/Ex-SM/PWD/ LDP/Minorities in the Company as on 31st December, 2020 is given in **Table 12.1**

Group	Total No of Employees	sc	ST	EX-SM	PWD	LDP	Minority
Executives	1640	249	141	0	22	26	65
Non- executives	4253	714	990	12	66	1,618	166
Total	5893	963	1,131	12	88	1644	231
		20	94				

Table 12.1

Hindustan Copper Limited (HCL)

Welfare Activities

Employees Participation in Management

12.15 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

12.16 Internal Committees have been constituted and amended from time to time in all the Units/Offices of the company for the prevention of sexual harassment of women in

work place, the details of the Committees and their members are available in the employee section of HCL's website. A provision in this regard has also been incorporated in the Conduct, Discipline and Appeal Rules of HCL. During the year no incidence has been reported/registered to the Committee at different Units/Offices.

Representation of SC/ST and OBC

12.17 The representation of SC, ST and OBC employees out of the total manpower of 1712 as on 01.01.2021 is 18.93%, 13.43% and 15.19% respectively.

12.18 Other Welfare Measures

 HCL has renewed the Contributory Post-Retirement Medical Scheme (CPRMS)-2021 for eligible Retired Employees (including Spouse) / Surviving Spouse of retired/deceased employees and is operational for a period of 01 (one) year w.e.f. 01.01.2021. The willing employees retiring in the year 2021 can also join the CPRMS-2021 scheme by paying pro-rata premium.

- The retired employees of the Company and their spouses are extended medical treatment at the Company's Hospitals at the Projects.
- The Company also extends support to 'Mahila Samity' and other institutions / NGOs in their endeavour to run 'Health Camps' for the local population under CSR programme.
- 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.
- The Company maintains Cultural Clubs for the employee at all the production Units.

Industrial Relations

12.19 Industrial Relations situation in all the Units of the Company continued to be harmonious and peaceful during the year 2020-21.

Redressal of public grievances machinery in HCL

12.20 All grievances are received from Centralized Public Grievance Redress and Monitoring System's (**CPGRAMS**) website of https://pgportal.gov.in. The grievances are being regularly monitored and are suitably disposed-off. During April-Dec 2020, 67 public grievances were received and there was previous carry forward of 6 grievances as on 1st April 2020. Total 56 cases were disposed-off during the year and as on 31.12.2020.

12.21 Status of implementation of the Rights of Persons with Disabilities Act, 2016

During last few years, there has been limited recruitment in the company. The number of physically challenged persons employed in the Company as on 01.01.2021 is given in **Table 12.2**.

Group	Number of Persons with Disabilities (PwDs)
А	14
В	1
С	4
D	9
Total	28

Table 12.2

Human Resource Development

12.22 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.

Manpower Strength in HCL

12.23 The manpower strength of the Company as on 01.01.2021 is 1712, details of which are given in **Table 12.3**.

Category	sc	ST	OBC	General	Total
Executives (Nos.)	87	25	103	343	558
Non- Executives (Nos.)	237	205	157	555	1154
Total (Nos.)	324	230	260	898	1712

Table 12.3

Mineral Exploration Corporation Limited (MECL)

Welfare of SC/ST, Women and Weaker section

12.24 MECL gives due importance to meet socio-economic needs of the SC/ST. During the period January to December, 2020 MECL has spent Rs. 16.24 lakhs for the skill development and health care of SC/ST. In addition to this, Rs. 5.48 lakhs is proposed to spent on the same activity for SC/ST.

12.25 Creche facility with well-equipped rest room, air conditioning, soft toys, and water facility has been continued at MECL premises at Gurukul for female employees and their children.

12.26 MECL is an equal opportunity employer for women employees where the service

rules are uniformity applicable to both male and female employees. The company is successfully running its crčche facility. The women employees in the Company are provided Maternity benefits as per rules.

12.27 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 2020-21 (data as on 31.12.2020)

12.28 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 has been set up to redress complaints received regarding sexual All employees harassment. (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 31.12.2020.

12.29 In line with the Rights of Persons with Disability Act, 2016, MECL has implemented Equal opportunity Policy as per directive of Ministry of Social Justice & Empowerment.

12.30 The category wise employment position including General /SC /ST /OBC /Minorities / Women (as on 31.12.2020) in the Company is given in **Table12.4**

Group	Total No. of employees	General	SC	ST	O.B.C	Minorities	Women
А	296*	174	35	14	73	15	25
В	05	02	02	00	01	00	01
С	699	299	128	37	244	28	38
Total	1000*	475	165	51	318	43	64

Table 12.4

* Including functional directors.

Indian Bureau of Mines (IBM)

Reservation of Vacancies for persons with Disabilities

12.31 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 December 2020, 12 physically handicapped persons were under employment in IBM .

Welfare activities for SC/ST, Women, Minorities and PWD's

12.32 Women employees constitute about 12.56 per cent. Training is imparted to women employees in the field of technical as well as administrative matters.

12.33 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.

Jawaharlal Nehru Aluminium Research Development and Design Center (JNARDDC)- Welfare for Persons with Disabilities (PWD), SC, ST& OBC

12.34 The Centre is following the various government guidelines w.r.t PWD, SC, ST and OBC reservation.

Welfare measures adopted in National Institute of Rock Mechanics (NIRM)

12.35 As per the Government of India guidelines, NIRM is following the necessary welfare measures with respect to Women, Minorities, SC / ST (recruitment) and other administrative aspects.

12.36 COVID-19 Preventive Care Campaign

Standard Operating Procedure (SOP) were

followed in view of COVID 19 pandemic. During the awareness campaign "MASK UP INDIA" slogans were displayed and various sections of the society in the surrounding were sensitised regarding the preventive care for safe and healthy life during the pandemic. As part of the covid preventive care campaign and societal care responsibility the surrounding communities in KGF were provided with basic necessities for enabling better nutrition and safe livelihood. This initiative was taken by NIRM RO in the interest of the social responsibility fulfilment towards poor people in the old abandoned mining area of KGF. An amount of Rs.1 Lakh was committed for this support and completed the support activity during the pandemic. Preventive care against COVID-19 and tools for enabling the same were provided as part of the measures. A covid task team was created for the purpose of the anti-covid measures in and around the NIRM office buildings and tools for temperature check, sanitisation tunnel, hand hygiene, office space sanitisation were all regularly carried out to mitigate the onsalught of the pandemic.

12.37 SC, ST welfare activities

Among the activities for SC / ST and backward communities, Ambedkar Jayanti celebrations were done at both NIRM HO and NIRM RO offices, remembering the values of Dr Ambedkar's guidelines and contribution to the upliftment of various sections of the people in various walks of life.



Photo 12.1: Ambedkar Jayanti Celebrations



<u>Budget and</u> <u>Audit Paras</u>

Annual Report 2020-21

181

Budget and Audit Paras

Ministry of Mines

Budget and Audit Paras

•	Budget Allocation of Ministry of Mines	Page - 183
•	GSI Budget Allocation	Page - 183
•	IBM Budget Allocation	Page - 187
•	Audit	Page - 188

Annual Report 2020-21

182

Budget Allocation for the year 2021-21 and 2021-22

13.1 Budgetary support under Revenue and Capital is obtained for different schemes implemented by Geological Survey of India

(**GSI**), Indian Bureau of Mines (**IBM**), and the S&T programme. Revenue provision is also obtained for GSI, IBM, Secretariat (Proper), Grants-in-Aid to Autonomous bodies, etc. A brief summary of Demands for Grants (2021-22) is given in the **Table13.1**.

SI.	Name of the Organisation	2019-20		2020	2021-22	
No.		BE	RE	BE	RE	BE
1	Secretariat (Proper)	48.55	41.75	42.43	41.89	41.50
2	Geological Survey of India	1322.93	1241.59	1349.98	1115.01	1181.58
3	Indian Bureau of Mines	124.31	109.11	128.31	94.00	110.00
4	Grants to MECL	0.00	0.00	0.00	0.00	0.00
5	Bharat Gold Mines Limited-Grants	4.50	4.50	5.50	7.00	5.84
6	S&T Programme/Other Programme (6.1 to 6.6)	25.26	21.27	25.18	22.78	27.90
6.1	NIRM	7.99	6.74	8.21	8.21	9.95
6.2	NIMH	0.98	0.98	1.00	0.30	0.00
6.3	JNARDDC	9.29	9.29	9.92	9.92	10.90
6.4	IC	0.35	0.35	0.40	0.35	0.40
6.5	NMA	0.65	0.65	0.65	0.00	0.65
6.6	Other Research Programme	6.00	3.26	5.00	4.00	6.00
7	NMET	150.00	110.00	150.00	90.00	100.00
	Total	1675.55	1528.22	1701.40	1370.68	1466.82

Table 13.1: Summary of Demands for Grants

(Rs. in crore)

Geological Survey of India (GSI)

13.2 For the Financial Year 2021-22, GSI has been allotted an outlay of Rs.1181.58 crore in BE stage which includes Rs.1115.68 crore in revenue head and Rs.65.90 crore in capital head. Out of this total allotted budget grant of Rs.1181.58 crore, Rs. 63.90 crore has been allotted for GSI activities of NER. The allotted outlay for Establishment Expenditure

is Rs.722.71 crore with a mandatory salary component of Rs.690.00 crore and Rs.94.97 crore for administrative support activities & other expenditure. The allotted outlay for GSI Mission (I to V) activities is Rs.298.00 crore and Capital outlay is Rs.65.90 crore for modernization & replacement activities of GSI. Activity-wise details of budget provision are summarized below-

- (a) Under 'Survey & Mapping' (Mission-I), an amount of Rs.131.40 crores has been allotted for ground, aerial and marine survey programmes of GSI during FS 2021-22. Out of this, a major amount of Rs.119.00 crore (approx.) has been provisioned for operation & maintenance of the three marine vessels and TOASS Aircraft of GSI. The rest amount is kept for execution of all field projects of Mission-I.
- (b) Under 'Mineral Exploration' (Mission-II), an amount of Rs.51.00 crores has been allotted for execution of mineral exploration programmes of GSI including payment towards outsourced drilling. Every year GSI is taking up G4, G3 and G2 stage exploration programmes with a view to augment resources for various mineral commodities and coal & lignite in different parts of the country. The budget provision has been marginally enhanced due to enhancement in operational cost for execution of field activities.
- Under 'Information & Dissemination' (c) (Mission-III), Rs.56.60 crore has been allotted for publication and IT office expenses, out of which Rs.52.00 crore has been allotted for Information Technology (IT) - OE head which includes payments related the operation / maintenance of OCBIS, CAMC of seismological instruments, procurement of IT hardware &software, other IT related expenditures and other miscellaneous activities of IT in all offices of GSI. Further, an amount of Rs.4.60 crore has been provisioned under Publication head for printing of publications/subscription of e-journals of GSI, procurement of hard copy journals etc.

- (d) Under 'Research & Development' head (Mission-IV), Rs.12.60 crore has been allotted for procurement of spare parts, consumables, chemicals, gases etc. required for smooth running of the laboratories of GSI, annual maintenance of sophisticated laboratory instruments as well as for execution of R&D programmes of GSI and outsourcing of chemical analysis of NGCM samples. Similarly, Rs.2.40 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 studies etc.
- (e) Under 'Human Resources Development' head (Mission-V), Rs.2.00 crore has been allotted for the expenditures related to the different training courses slated to be conducted by the GSITI for capacity building.
- (f) Under 'Modernization & Replacement' activity, Rs.65.90 crore has been allotted which includes an amount of Rs.65.00 crore under Machinery & Equipment (M&E) head and Rs.0.90 crore under Motor Vehicle (M-V) head. Under the M&E head, major provision has been made for hydrostatic drilling rigs and procurements of high-end laboratory and field instruments. The projection under MV head has been made for procurement of field vehicles etc.
- (g) Under 'Tribal Area Sub-Plan' (TSP) &'Special Component Plan for Scheduled Caste' (SCSP) heads, Rs.14.40 crore & 27.60 crore have been allotted respectively for welfare service to the ST/ SC people indirectly by utilization of the

funds under mandated Mission-I, II, IV & V field activities falling in scheduled tribe and Scheduled cast dominated areas in different parts of the country.

(h) Under the Administrative Support Activities and other expenditure head, Rs.94.97 crore has been allotted out which Rs.61.50 crore has been projected for expenditures like domestic / foreign travel, rents / taxes of buildings, office expenses and professional services etc.; Rs.32.00 crore for Minor works for different GSI buildings and for GSI's

museum at Gwalior; Rs.0.90 crore for supply & material, Rs.0.07 crore for clothing & tentages and Rs.0.50 crore for advertisement and Publicity.

Apart from the above, an amount of Rs. 722.71 crore has been allotted under the 'Establishment Expenditure' to meet the salary expenditures (Rs.690.00 crore) and other expenditures in this head e.g. medical expenses, wages, OAE, OE (V), OTA, Swachhta Action Plan, etc. The distribution of outlay for the allotted Budget grant for 2021-22 is given in the **Table 13.2**.

Heads	GSI	NER	Total
Direction and Administration -			
Salaries	63500	5500	690
Wages	1400	0	14
Overtime Allowance	1	0	
Medical	750	0	-
Office Expenses (Charged)	0	0	
Office Expenses (Voted)	800	0	3
Other Administrative Expenses (OAE)	250	0	-
Swachhta Action Plan (Other Charges)	70	0	
TOTAL [Establishment Expenditure]	66771	5500	722
Administrative Support Activities			

wages	1400	0	1400
Overtime Allowance	1	0	1
Medical	750	0	750
Office Expenses (Charged)	0	0	0
Office Expenses (Voted)	800	0	800
Other Administrative Expenses (OAE)	250	0	250
Swachhta Action Plan (Other Charges)	70	0	70
TOTAL [Establishment Expenditure]	66771	5500	72271
Administrative Support Activities			
Domestic Travel Expenses (DTE)	3700	200	3900
Foreign Travel Expenses (FTE)	50	0	50
Office Expenses (OE)	1550	200	1750
Rents, Rates and Taxes (RRT)	250	50	300
Professional Services	148	2	150
TOTAL	5698	452	6150
Training (Human Resource Development)			
Other Administrative Expenses	192	8	200
Grant-in-Aid-General	0	0	0
TOTAL	192	8	200
Research & Development			
Laboratory Research			
Wages	100	10	110

(Rs. In Lakhs)

69000

Heads	GSI	NER	Total
Supply & Material	408	12	420
POL	30	0	30
Other Charges	685	15	700
TOTAL	1223	37	1260
Investigation			
Geo-tech, Seismic, Environment			
Wages	75	15	90
POL	20	10	30
Other Charges	90	20	110
TOTAL	185	45	230
Survey & Mapping			
Ground, Aerial & Marine Survey			
Wages	625	25	650
POL	80	10	90
Other Charges	12375	25	12400
TOTAL	13080	60	13140
Mineral Exploration			
Economic Minerals			
Wages	1160	40	1200
POL	475	25	500
Other Charges	3350	50	3400
TOTAL	4985	115	5100
Other Exploration			
Antarctica			
Other Charges	10	0	10
TOTAL	10	0	10
Other Charges (Special Component Plan for Schedule Castes)	2760	0	2760
Other Charges (Tribal Area Sub- Plan)	1440	0	1440
Other Expenditure			
Major different operations - Establishment			
Publication	456	4	460
Supply & Material	85	5	90
Clothing & Tentage	7	0	7
Advertisement & Publicity	46	4	50
Minor Works	3200	0	3200
Information Technology			
Office Expenses	5100	100	5200
TOTAL	8894	113	9007
Capital Outlay			

Heads	GSI	NER	Total
Acquisition of Capital Assets			
Motor Vehicle	80	10	90
Machine & Equipment	6450	50	6500
TOTAL(Capital)	6530	60	6590
GRAND TOTAL (Rev. + Cap.)	111768	6390	118158

Indian Bureau of Mines (IBM)

13.3 The Demands for Grants i.e. sanctioned Budget Estimates for the Financial Year 2021-22 is Rs.110.00 crores including Rs.14.69 crores under IBM Activities and Rs.95.31 crores under Establishment. Head-wise cum Scheme-wise breakup of Activities & Establishment Budget is **Table 13.3**.

	(Rupees in Laki								in Lakhs)		
SI. No.	Object Heads	Establi- shment	Scheme No. 1	Scheme No. 2	Scheme No. 3	Scheme No. 4	Scheme No.5	Other Heads	NER	Total Activities	Total BE for 2021-22
1	2	3	4	5	6	7	8	9	10	11	12
Reve	nue Section										
1	Salary	7990.00	5.00	5.00	5.00	5.00	-	-	90.00	110.00	8100.00
2	Wages	16.00	1.00	1.00	1.00	1.00	-	-	0.50	4.50	20.50
3	Overtime Allowance	0.10	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.10
4	Medical Treat.	150.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00	150.00
5	Domestic Travel Expenses	160.00	10.00	10.00	10.00	10.00	-	-	2.00	42.00	202.00
6	Foreign Travel Expenses	5.00	0.00	0.00	0.00	0.00	-	-	0.00	0.00	5.00
7	Office Expenses	230.00	20.00	10.00	10.00	10.00	-	-	2.00	52.00	282.00
8	Rent, Rates & Taxes	130.00	20.00	0.00	0.00	0.00	-	-	7.00	27.00	157.00
9	Publications	0.00	0.00	0.00	10.00	0.00	-	-	0.00	10.00	10.00
10	Other Administrative Expenses	0.50	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.50
11	Supplies & Materials	6.00	1.00	0.00	0.00	0.00	-	-	0.00	1.00	7.00
12	P.O.L.	0.00	5.00	1.00	2.00	2.00	-	-	0.00	10.00	10.00
13	Advertising & Publicity	0.00	3.00	0.00	0.00	0.00	-	-	0.00	3.00	3.00
14	Minor Works	550.00	20.00	20.00	10.00	0.00	-	-	0.00	50.00	600.00
15	Professional Services	12.00	2.00	0.00	1.00	0.00	-	-	0.00	3.00	15.00
16	Subsidies	0.40	0.00	0.00	0.00	0.00	-	-	0.00	0.00	0.40
17	Other Charges	281.00	20.00	10.00	10.00	10.00	-	-	2.50	52.50	333.50
18	Mining Tenement System (OAE)	-	-	-	-	-	600.00	-	0.00	600.00	600.00
19	Information Technology (OE)	-	-	-	-	-	-	50.00	1.00	51.00	51.00

Table 13.3

SI. No.	Object Heads	Establi- shment	Scheme No. 1	Scheme No. 2	Scheme No. 3	Scheme No. 4	Scheme No.5	Other Heads	NER	Total Activities	Total BE for 2021-22
1	2	3	4	5	6	7	8	9	10	11	12
20	Swachhta Action Plan (OC)	-	-	-	-	-	-	10.00	-	10.00	10.00
21	Training (OAE)	-	-	-	-	-	-	15.00	-	15.00	15.00
22	Tribal Area Sub Plan (OC)	-	-	-	-	-	-	63.00	-	63.00	63.00
23	Special Component Plan for Scheduled Castes (OC)	-	_	-	_	_	_	122.00	-	122.00	122.00
Total	(Revenue)	9531.00	107.00	57.00	59.00	38.00	600.00	260.00	105.00	1226.00	10757.00
Capit	al Section										
24	Works Outlay (Major Works)	-	-	-	-	-	-	1.00	-	1.00	1.00
25	Motor Vehicles	-	-	-	-	-	-	100.00	-	100.00	100.00
26	Machinery & Equipments	-	-	-	-	-	-	100.00	-	100.00	100.00
27	Other Capital Expenditure (NER)	-	-	-	-	-	-	-	42.00	42.00	42.00
Total	(Capital)	0.00	0.00	0.00	0.00	0.00	0.00	201.00	42.00	243.00	243.00
GRA	ND TOTAL	9531.00	107.00	57.00	59.00	38.00	600.00	461.00	147.00	1469.00	11000.00

Note:

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

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

- 3 Scheme No. 3- Technological upgradation and modernisation.
- 4 Scheme No. 4- Mines and minerals through various publications.
- 5 Scheme No. 5 Computerization online register on mining tenement system.

Audit

13.4 There is no pending CAG para pertaining to Ministry of Mines, GSI and IBM as on 31.12.2020.

13.5 The Status of Internal Audit Paras of GSI (as on 31.12.2020) is given in Table 13.5

Table 13.5

	No of Paras
Outstanding Paras at the beginning of the year	1576
Para raised /settled during the year	808
Para still outstanding	768

Follow up action with Regions has been taken up to settle the paras.

$\mathbf{14}$

<u>Miscellaneous</u>

Annual Report 2020-21

Miscellaneous

•	National Informatics Centre (NIC)	Page –	191
•	E-Office	Page –	192
•	Website of the Ministry	Page –	193
•	E-samiksha	Page –	193
•	Skill Development	Page –	193
•	Redressal of public grievances	Page –	198
•	Vigilance cases	. Page –	199
•	Swachh Bharat Abhiyan	. Page –	200
•	RTI	Page –	202
•	Government e-Market (GeM) Portal	Page –	204
•	Days observed in the Ministry	Page –	204

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 NIC is implementing various decision support system required for better planning, monitoring and decision making. The key driver for the MIS websites/applications is to reduce the Ministry's workload and increase overall efficiency by promoting 'self-service'. The computerization has been done in the area of Science and Technology Schemes, Mineral Concession Information and Data Repository, Registration under Rule 45 of MCDR, Revision Applications, Information on Mining blocks auctioned/to be auctioned along with revenue generated, National Mineral Exploration Trust, Indent, Conference Hall Bookina and Video Conference Request Booking.

- a) Dashboard of Ministry of Mines (http://dashboard.mines.gov.in)
- b) Satyabhama a Web Portal for Science and Technology Schemes (https://research.mines.gov.in)
- c) Mineral Concession Information and Data Repository System (https://mcas.nic.in)
- d) Revision Application System (RAS) (https://ras.nic.in)



q)



- f) Website of the Ministry of Mines (https://mines.gov.in)
 - TAMRA (Transparency, Auction Monitoring and Resource Augmentation) Portal (https:// tamra.gov.in)
- h) Website of National Mineral Exploration Trust (NMET) (https://
- Intra-mines Web portal (Covers e-Indent of various stationary items and cleaning material, online booking of Conference Rooms and Service Request). This service is operational on Local Area Network of the Ministry.
- j) International Cooperation Management System (Under Development)
- k) Non-Ferrous Metal Import Monitoring System(NFMIS) (Under Implementation)

Support for e-Governance Applications

14.3 The following e-Governance applications have been implemented and supported by NIC in the Ministry:

- Public Financial Management System
- eOffice and SPARROW
- eVisitor 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 FMS team of the Shastri Bhawan Network Centre.

Wi-fi Support

14.5 Ministry of Mines has been made wi-fi enabled by NIC-Mines team. Form processing for wi-fi connection and device configuration is done by NIC Mines Team. As on date, 10 wi-fi access points are installed in the Ministry covering 'A' and 'D' Wings. Trouble shooting of wi-fi related problems is done on regular basis.

Videoconferencing Support

14.6 Videoconferencing of the Ministry Officials with the State Governments. Subordinated Offices, PSUs and PRAGATI VC is being facilitated by the NIC-Mines team. During the Covid-19 pandemic, most of the meetings are taking place through video conferencing and support is being provided by NIC-Mines team. There are 6 VC studios operational in Ministry of Mines. To cater the excessive demand of VC, 3 exclusive Web VC rooms (Links) have been created for Ministry of Mines to organise VC from any remote location having internet connectivity. Approximately over 300 VC meetings have been conducted over the video conferencing system of NIC.

Email/VPN Support

14.7 Email requests of the Ministry Officials are processed by NIC Mines Team as and when required. Requests related to Virtual Private Network (VPN) accounts to access the e-office from networks other than NIC net are also processed through NIC team of Ministry of Mines.

IT support to Associated Offices of the Ministry

14.8 Besides the routine coordination work at Ministry of Mines, the team is also extending support to all the associated offices of the Ministry (through NIC staff deputed at various locations) such as:

- i. Indian Bureau of Mines (**IBM**) for Registration System and for conducting video conferencing sessions with the Ministry.
- Geological Survey of India (GSI) for conducting video conferencing sessions with the Ministry and guiding them to resolve security issues in application.
- iii. PSUs of Ministry of Mines for conducting video conferencing sessions with the Ministry.

E-Office

14.9 The e-office is being implemented in the Ministry of Mines from May, 2013.

14.10 The following modules have been successfully adopted:

- **eFile** (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.
- **KMS** (Knowledge Management System)-KMS is a central repository for all employees to share all the documents/ OM/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.
- eHRMS (Human Resource Management System) - Leave Management System (LMS) has been replaced by eHRMS-**Electronic Human Resource Management** System. eHRMS was implemented in Ministry from 1st August, 2019. There are 20 modules of eHRMS, out of which only 6 are currently implemented. These are Service Book, Personal Information, Leave, LTC, eHRMS Help Desk and Dash Board. As of now Service Book of all the officers has been digitalized and migrated to E service Book in eHRMS. Leave Module has been fully functional from 15th November 2019 in Ministry of Mines.

14.11 Total Number of e-files created till 31st December, 2020, is 19184. The scanning of physical files is under implementation for migration of files to e-office. Ministry of Mines has been awarded "Certificate of Appreciation" by Department of Administrative Reforms & Public Grievances, Ministry of Personnel, Public Grievances & Pensions on 12th February, 2019 for the successful implementation of e-office and closure of 80% of physical files.

14.12 Website of the Ministry

Website of Ministry of Mines is developed and maintained by third party with the technical help of 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.

Website of the Ministry (https://mines. gov.in) is "Guidelines for Indian 🖁 Government Websites" (GIGW) compliant and "Standardisation Testing and Quality Certification" (STQC) certified.

E- Samiksha

14.13 e-Samiksha is а real-time online 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 issues, observations made by Cabinet, recommendations made by Committee of Secretaries, etc. The followup 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 the issues raised by the Ministries/Departments and State Governments are taken up on priority basis and status is uploaded on e-samiksha portal every month. Ministry of Mines has been regularly monitoring the follow-up action in respect of e-samiksha portal.

Skill Development

14.14 The Ministry of Mines (**MoM**) with cooperation of the Ministry of Skill Development and Entrepreneurship (MSDE) has undertaken steps for skill development for increasing productivity and accelerated, sustainable and inclusive growth in the mining sector. The process of skill development started with signing of Memorandum of Understanding (MoU) by MoM, along with its PSUs (NALCO, HCL and MECL), with MSDE and the National Skill Development Corporation

(**NSDC**). The apprenticeship training initiative undertaken by the CPSEs for the last 3 years is given in **Table 14.1**.

Name of CPSE	No. of apprentices engaged in 2017-18	% total manpower	No. of apprentices engaged in 2018-19	% of total manpower	No. of apprentices engaged in 2019-20	% of total manpower	No. of apprentices engaged in 2020-21 (till Dec, 2020)	% of total manpower
NALCO	866	12.78%	811	12.454%	900	14.34%	556*	9.43%
HCL	290	4.7%	290	4.8%	308	4%	110	1.55%
MECL	71	3.9%	46	2.5%	68	3.6%	13	0.57%*

Table 14.1 Apprenticeship Training

* Due to COVID pandemic there was constraints in engaging Apprentice trainee.

**Due to outbreak of COVID-19 and subsequent imposition of nation-wide lockdown and in order to prevent overcrowding of workplace, engagement of apprentices was temporarily placed on hold. Projected Engagement of Apprentices for January-March, 2021 is 15%.

Status of Centre of Excellence

14.15 National Aluminium Company Limited (NALCO)

In a move to create skilled manpower and make unemployed youth job ready, Centre of Excellence for Skill Development i.e. NALCO Center of Excellence of Mining (NCEM) with heavy mining equipment simulator facility and training which was initially planned at Bhubaneswar is being reviewed to shift to Mines & Refinery Complex, Damanjodi. The shifting of the NCEM from Bhubaneswar to M&R Complex Damonjodi is being considered due to constraints at Bhubaneswar NRTC centre. The establishment of NCEM at Mines & Refinery Complex, Damanjodi will cater to the need of fresh skill development and also provide simulator based training to drivers and operators of HEMM at Mines Division, Mines & Refinery Complex, Damanjodi.

14.16 Hindustan Copper Limited (HCL)

An MoU was signed on 29th January, 2019 between Skill Council for Mining Sector (**SCMS**) and HCL, Khetri Copper Complex for training program in trade of Winding Engine Operator/Driver. The duration of this training program is 14 months including classroom training, mine vocational training and on-the-job training. The program was rolled out in March, 2019. Earlier SCMS has conducted training program at HCL Khetri Copper Complex in the trade of Assistant Mine Surveyor over 2 batches covering 56 candidates. This program consisted of 6 months of class room and practical training followed by 18 months on the job training at the mines.

Skill Plan for the next 5 years

14.17 The skill development initiative of Ministry of Mines has focus on following:

- a) Advanced training for adoption of technology towards augmented exploration.
- b) Application of remote sensing data for mines surveillance including usages of GIS platform.
- c) Training on health, safety and environmental issue for safe and sustainable mining practices.

- d) Operation of plants & machinery for open cast and underground mining with primary objective of enhancing productivity.
- e) Training on acquisition, processing and interpretation of geo-scientific data involving fundamental and applied research.
- f) Advance method of mineral beneficiation process involving optimum utilization of energy and utilities.

Geological Survey of India (GSI)

14.18 Employees of GSI need training in skills such as field and hands-on training in the field of Geological, Geophysical and Geochemical Mapping; techniques of Mineral Investigation and 3D-Statistical Modeling of Mineral Resources; Geo-scientific data handling techniques and integration; Fundamental and Advanced Research Methodologies in Geo-sciences and Public-Good Geosciences; Processing and interpretation of Aerogeophysical data as well as Multi-seismic marine data; Techno-administration including Grievance and Vigilance, HR Management and Financial Management etc.

14.19 Methods envisaged for carrying out training are Field demonstration at geological sites; Hands-on training at geo-scientific laboratories; Classroom training on Geo-scientific techniques and their advancements; Classroom trainings on Administration and Management; Domain-specific (Basic, Refresher and Advanced) training through classroom lectures, at field sites as well as in the laboratories; Training in collaboration with reputed agencies/academic institutes.

14.20 Skills for which training required for other stakeholders connected to GSI are Geo-

scientific investigations, Mineral Investigation techniques and 3D-Modelling of Mineral Resources; Operation of geo-scientific equipment and relevant software in domain of geosciences; Imparting training in a specific domains viz. Basic, Refresher and Advanced by classroom lectures, laboratories and field sites demonstration.

14.21 Between January and December 2020, 5614 personnel from GSI and 11079 participants from stakeholder organizations connected to GSI have been trained mainly through online (e-training) mode during the COVID-19 pandemic situation. During the period, 18 International participants were trained under Indian Technical Economic Cooperation (ITEC) programme, Ministry of External Affairs, Government of India. Apart from above, 16706 participants from different academic institutions across the country were also trained. It is envisaged to train 50 numbers of own employees and 1000 numbers of other participants from January to March, 2021.

Indian Bureau of Mines (IBM)

14.22 Indian Bureau of Mines (**IBM**), according to its charter of functions, needs to enhance its skills in various advanced technologies for mine regulation and development.

14.23 The IBM personnel are imparted trainings at Headquarter for 2-3 days and at its regional offices as well as at two skill development centres located at Udaipur and Kolkata. Training is given through Classroom lectures/presentation by the faculties drawn from IBM as well as Industry. In last couple of years, IBM personnel had attended training programme in outside organization/ Institute like GSI, National Remote Sensing Centre, ASCI, etc. Accordingly, further training programme wherever necessary

will be conducted in association with these organization / institutions. Further, through bilateral cooperation with other countries, capacity building programme will be taken up.

14.24 Skills for which training required for other stakeholders connected to **IBM:** IBM has imparted training and capacity building programmes to 982 numbers of its own employees and 788 numbers of industry personnel and State Government officers during 2017-18 to 2021 (up to January, 2021). IBM makes its presence in the meetings as organized by GSI/ MECL for its active participation, towards synergic approach. Further, 22 officers of IBM have participated in an e-training programme on Remote Sensing and GIS applications conducted by GSITI from 01.06.2020 to 13.06.2020. Besides, 2 officers from IBM attended e-training programme on GIS and Remote sensing application organized by RTI, GSI WR Jaipur from 19.10.2020 to 23.10.2020. Further, 8 officials of IBM attended two days' training programme on "Preventive Vigilance" from 8thto 9thDecember, 2020 conducted by MECL under IBM_MECL Synergy.

14.25 IBM has initiated its efforts to upload its training modules on iGOT platform. IBM has also identified and prepared the power point presentations of its lectures on different subject topics by faculty members of IBM. Efforts are being made for their videography/ audiography, so as to upload them on IGOT platform. Total 25 numbers of lectures are identified under 06 modules. The work is under progress.

14.26 BHUVISAMVAD activity was initiated by IBM in technical/engineering institutions, colleges, polytechnics and university

departments on pan India basis. The instructions and guidelines to IBM field offices had been sent vide letter dated 24.12.2019 for its implementation. During January 2020 to December 2020, a total of six programmes were conducted under this activity three at Nagpur and one each at Chennai, Raipur, Udaipur, wherein 500 student participants from engineering colleges, university PG departments also industry persons attended. The broad topics are Role & Responsibilities of Indian Bureau of Mines, Mining Policies and Regulatory framework, Sustainable Development Framework in Indian mining sector and Advanced techniques in mineral characterization & chemical analysis and mineral beneficiation vis-ŕ-vis facilities available in mineral processing laboratories and pilot plant in IBM and carrier perspectives in mining sector.

Mineral Exploration Corporation Limited (MECL)

14.27 Employees of MECL need training for skills in areas of Drilling & Exploration, Diamond Core Drilling Skill Enhancement, 3D ore body modelling through Surpac and datamine, Mud Technology, use of software like Minex, Surpac, AutoCAD, Datamine, Exploration for REE & Rare Earth Metals, use of high-end equipment DGPS-(PPK) system, Advanced Drilling Technology, Advances in Geosciences for Exploration of Minerals, JORC for Estimation of Mineral Resources, etc.

14.28 Methods for imparting training are Classroom training, Lectures, Seminars, Conferences and on-job trainings. It is envisaged to train 400 employees of MECL in the next five years.

National Aluminium Company Limited (NALCO)

14.29 Skills for which training is required for employees of NALCO are **Behavioural skills**–Leadership, Labour Laws, EQ, legal drafting skill, etc.; **Functional skills**- (i) Safety, (ii) Electrical, (iii) PLC skill, (iv) O&M of Testing and safety of materials handling equipment, (v) Digitisation skill- PLC & System Automation, etc.

14.30 Working as per international standard- (i) SA 8000, (ii) Internal Audit, (iii) Productivity improvement & measurement, (iv) Quality management, Project execution skill of employees, Contract handling skill for employees, Presentation skill for employees, Communication skill for employees, Negotiation skill for employees.

14.31 Method for imparting training: In house through internal faculties, through external agencies of repute, through equipment provider.

Hindustan Copper Limited (HCL)

14.32 Skills for which training required for employees of HCL are Mines Refresher Training, Fire Fighting Training, First Aid Training, Safety Training, Soft Skills Training, Fitters, Mechanics, Riggers, Welders, Mine Surveyor Assistant, Loader & hauling operation, Blasters, Winding engine operators for underground shaft, Mining mate, HEME operators, Drilling machine operators, Ball Mill operations for beneficiations, Pump operators for mine dewatering, etc.

14.33 Method for imparting training: Training by own faculty at the Vocational Training Centers in Khetrinagar Copper Complex (KCC), Malanjkhand Copper Complex (MCP), Indian Copper Complex (ICC), Reskill / Upskill in Collaboration with National Skill Development Corporation (NSDC), Delhi.

14.34 Skills for which training required for other stakeholders connected to HCL are Loader & hauling operation, Blasters, Winding engine operators for underground shaft, Electrician, Mechanical, Fitter, Welder, General Technician, Machinist, Crane Operator, Carpenter, Plumber, Draftsman, Turner. It is envisaged to train 905 numbers of own employees and 710 numbers of other stakeholders connected to HCL in the next five years.

National Institute of Rock Mechanics (NIRM)

14.35 Skills for which training required for employees of NIRM are Destructive Testing-Reverse Bend Testing, Torsion Testing, Impact Testing, Compression Test, Tensile Strength (Vertical & amp; Horizontal), Non-Destructive Testing (NDT)- Visual Testing, Dye-Penetrant Magnetic Particle Test, Ultrasonic Test, Testing, Vibration Test, Noise analysis, IR Thermography, Wire Rope Defectograph, Soil / Rock Testing, Instrumentation Installation and monitoring, Statistical Software Training, MATLAB, AUTOCAD, Training on and Rhinoceros software, GIS and Remote sensing data processing, Computerised Accounting, MIS training, Advance training mine planning & design, Numerical Modelling training, Material & Rock Testing, Skill Certification courses, Safety & Rescue Courses, etc.

14.36 Method for imparting training: On the job training, Certification course training viz., ISNT/ ASNT level I& II Course, Participation in Conference, Seminar, Workshop, Symposium, Short term courses.

14.37 Skills for which training required for other stakeholders connected to NIRM are

Drilling &Exploration, Advanced Drilling Technology, use of High-end equipment DGPS-(PPK) system, Exploration for REE & Rare Earth Metals, Diamond Core Drilling Skill Enhancement, Use of software like Minex, Surpac, AutoCAD, Datamine, Mud Technology, Jerk Technology for estimation of Minerals, etc.

Redressal of Public Grievances

14.38 Department of Administrative Reforms & Public Grievances (**DAR&PG**) has implemented a web based Centralized Public Grievance Redressal and Monitoring System (**CPGRAM**) vide which grievances pertaining to concerned Ministries / Department are forwarded for redressal. A Joint Secretary has been designated as the Nodal Officer of Public Grievances. During the period 1st January, 2020 to 31st December, 2020, 1150 Public Grievances were received and 295 pending cases were brought forward from the year 2019. A total of 1332 Public Grievances have been disposed of during the period and the remaining cases have been referred to the concerned Organization / Authority for taking further necessary action in the matter.

14.39 Details of action taken on the public grievances of this Ministry and its attached / subordinate offices during the year 2020 (from 01st January 2020 till 31st December, 2020) are given in **Table 14.2**.

Organization	No. of public grievances pending as on 31.12.2019	Public grievances received during 01.01.2020 to 31.12.2020	Disposed cases during 01.01.2020 to 31.12.2020	Pending cases as on 31.12.2020
Ministry of Mines	254	820	974	100
Geological Survey of India (GSI)	11	218	229	0
Indian Bureau of Mines (IBM)	6	44	49	1
National Aluminium Company Limited (NALCO)	0	23	23	0
Hindustan Copper Limited (HCL)	5	48	53	0
Mineral Exploration Corporation Limited (MECL)	0	4	4	0
JNARDDC	0	0	0	0
NIRM	0	0	0	0
NIMH	0	1	1	0

Table 14.2

Vigilance Cases

Ministry of Mines

14.40 Details pertaining to Vigilance Division of this Ministry and its attached/ subordinate offices during the year 2020 (from 01st January, 2020 till 31st December, 2020) are given in **Table 14.3**.

Organization	No. of complaints pending as on 31.12.2019	Complaints received during 01.01.2020 to 31.12.2020	Disposed cased during 01.01.2020 to 31.12.2020	Pending cases as on 31.12.2020
Ministry of Mines, New Delhi	21	12	19	14
Geological Survey of India	04	43	42	05
Indian Bureau of Mines	01	31	30	02

Table 14.3

14.41 The details of disciplinary cases arising from vigilance complaints received during the year 2020 (from 01stJanuary, 2020 till 31st December, 2020) is given in **Table 14.4**.

Organization	No. of Disciplinary cases	Nature of the penalty recommended	Status (as on 31.12.2020)
Ministry of Mines, New Delhi	5	Major: 5 Minor: 0	Disciplinary proceedings underway
Geological Survey of India	2	Major: 2 Minor: 0	Major Penalty imposed in both cases
Indian Bureau of Mines	NIL	NIL	NIL

14.42 Vigilance Awareness Week was observed from 27th October, 2020 to 2nd November, 2020 in the Ministry as well as in its subordinate / attached offices of the Ministry. During the week, essay competition related to vigilance activities was organized in Ministry.

Geological Survey of India (GSI)

14.43 A glimpse of vigilance activities carried out at GSI are as under:

a. To enforce Preventive Vigilance, total 07 CTE type inspections, and 136 periodic inspections of identified sensitive areas were carried out. To promote awareness in vigilance, 07 training programs were organized. Further, the rules, guidelines in pertinent matters issued from time to time by DoPT, CVC, DoE etc. have been circulated through online portal for wider dissemination amongst the employees. GSI has initiated action to introduce e-office premium software package. Provisions have been made to lodge internal whistle blower complains by the employees directly to CVO through online mode. Vigilance status of the employees is maintained online and Vigilance Clearance is processed through online mode. Annual Immovable Property Returns are examined on random basis. For faster processing, an online system for generating provision of 'Exception Report in AIPR' has been developed in GSI.

- A compendium covering various Vigilance related issues has been released by GSI. The Compendium will create adequate awareness on vigilance matters amongst all strata of the employees and would, therefore, facilitate fair, just and prompt decision making.
- c. GSI would institutionalize the Preventive Vigilance Training Module as developed by CVC in its Induction and Mid-Career Training Programme (MCTP) for the purpose of equipping the officers with the holistic knowhow commensurating to the imminent assignment.
- d. During the Vigilance Awareness Week 2020, various Workshops, Sensitization Programme for the employees on policy/ procedure of the organization and on preventive Vigilance measures were organized viz. 'Leveraging of Technology for Vigilance', 'Preventive Vigilance as a tool for Good Governance', 'Conduct Rules' and many others.

Indian Bureau of Mines (IBM)

14.44 During the year 2020 (1st January 2020 to 31st December 2020), 30 complaints were received of which 30 were brought to their logical conclusion and appropriate action initiated as deemed fit after investigation. 02 cases are under investigation.

14.45 During the period, vigilance office inspected 06 mining plans of Limestone Mines under jurisdictions of Chennai Regional Office and Gandhinagar Regional Office of IBM. As preventive measures 02 files related

to maintenance of vehicle of IBM and stores purchase were inspected under jurisdiction of Hyderabad Regional Office, IBM Further, 01 file related to procurement of Atomic Absorption Spectrometer pertaining to Mineral Processing Division of IBM was carried out. Outcome of the same has been shared with the Competent Authority. In total 269 Annual Immovable Property returns for the year ending 31.12.2019 in respect of employees of IBM were scrutinized by this office, no adverse observations were made. During the period, Agreed List / ODI list were prepared for the year 2020. Further, to promote awareness on vigilance, a Lecture Session was organized on 02.11.2020 to sensitize the officers and staff of Indian Bureau of Mines through video conference. Furthermore, the rules guidelines in pertinent matters as issued from time to time by DOPT, CVC, etc. have been circulated through Head of Office, IBM to all Zonal & Regional Offices of IBM. As per standard procedure guidelines issued by GOI on Covid-19 pandemic, various programs such as Essay, Debate, Quiz, Poster, Slogan, Speech competitions were organized in all the Zonal / regional / Sub-Regional Offices of IBM on the occasion of Vigilance Awareness Week, 2020. E-Magazine, "Prahari" on the theme "Satark Bharat, Samriddh Bharat" ("Vigilance India, Prosperous India") was released by the Joint Secretary and Controller General (I/c), IBM, on the Concluding Day Function held on 02.11.2020.

Swachh Bharat Abhiyan

Ministry of Mines

14.46 Ministry of Mines and PSUs/attached offices under the Ministry of Mines organized the following Swachhta fortnights under the Swachh Bharat Abhiyan:

- i) 15.09.2015 to 31.09.2015
- ii) 12.12.2015 to 27.12.2015
- 01 03 2016 to 15 03 2016 iii)
- iv) 16.06.2016 to 31.06.2016
- V) 16.12.2017 t0 31.12.2017
- 16.10.2018 to 31.10.2018 vi)
- vii) 16.11.2019 to 30.11.2019
- 16.11.2020 to 30.11.2020. viii)

Activities under Swachh **Bharat** Mission

14.47 Ministry of Mines has ensured in its dayto-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

14.48 The Ministry has ensured all those items which were old/ unserviceable to keep specific space marked by CPWD. The Ministry does not have any condemned vehicle in its premises.

Seepage of condensed water of ACs

14.49 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

14.50 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

14.51 Instruction has been issued to ensure that all electrical points are switched off after closing of the office.

Daily Sanitization of Premises of **Ministry of Mines**

14.52 Ministry of Mines has ensured that daily sanitization of corridors, rooms and lift lobby in premises of Ministry of Mines, Shastri Bhawan is conducted.

14.53 Swachh Bharat Abhiyan in JNARDDC

JNARDDC undertook a pledge to implement the Swachh Bharat एक कदम स्वच्छता की ओर



Abhiyan launched by Hon'ble Prime Minister Shri Narendra Modi. JNARDDC has already undertaken the cleanliness of all labs and office premises, toilets etc. The lighting systems of guest house and hostel are being changed with LED lights in a phase-II. Swachhta Pakhwara was observed in Nov. 2020 with a view to encourage the zeal of the above program. For the year 2020-21, JNARDDC has been chosen for plantation scheme by Divisional Commissioner, Nagpur under CSR budget of Power Grid Corporation of India.

14.54 Swachh Bharat Abhiyan in NIRM

On the occasion of the "Swachh Bharat Mission", National Institute of Rock Mechanics organized Swachhta Pakhwada 2020 in and around NIRM Head Office Bengaluru and NIRM Registered Office KGF during 16th to 30th November 2020. Following activities were done during the Swachhta Pakhwada and

COVID-19 appropriate behaviour campaign:

- Displaying Swachhta slogans on the notice board / website
- ✓ Clean and green office compound and resident area
- ✓ Campaign for "MASKUP INDIA"
- Essay competition/webinar
- ✓ Swachhta slogan competition
- Capturing of all activities through still photography

Right to Information Act, (RTI)

Ministry of Mines

14.55 The Ministry of Mines and its subordinate office, attached office, Autonomous Bodies

and Public Sector Undertaking (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. 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 year 2020 (1st January, 2020 to 31st December, 2020), the Ministry received 666 applications under the RTI Act, which were timely responded. 70 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, First Appeals and Second Appeals w.r.t. the Ministry and its office is given at Table 14.5, Table 14.6 and Table 14.7 respectively.

Table 14.5RTI Applications / Request Status (w.e.f. 1st January, 2020 to 31st December, 2020)

		No. of cases				Pendency			
Organizations	Previous Pendency	No. of RTI / Requests / Applications received during the period	Disposal	Information denied under section 8 (1), 9, 11, 24 & other of RTI Act	Balance	0-3 Months	4-6 Months	7-9 Months	10-12 Months
Ministry of Mines (Sect.)	110	588	568	Nil	20	20	Nil	Nil	Nil
NALCO	15	282	277	Nil	20	20	Nil	Nil	Nil
HCL	28	94	117	Nil	5	5	Nil	Nil	Nil
MECL	96	73	167	Nil	2	2	Nil	Nil	Nil
IBM	29	294	314	Nil	9	9	Nil	Nil	Nil
GSI	229	439	653	Nil	15	15	Nil	Nil	Nil
NIRM	1	7	8	Nil	Nil	Nil	Nil	Nil	Nil
JNARDDC	Nil	2	2	Nil	Nil	Nil	Nil	Nil	Nil

Table 14.6 RTI Appeals Status (w.e.f. 1st January, 2020 to 31st December, 2020)

Organizations	No. of cases					Pendency			
	Previous Pendency	No. of 1 st Appeals received during the period	Disposal	No. of Appeals rejected/ information denied under Section	Balance	0-3 Months	4-6 Months	7-9 Months	10-12 Months
Ministry of Mines (Sect.)	1	62	55	Nil	8	8	Nil	Nil	Nil
NALCO	0	42	39	Nil	3	3	Nil	Nil	Nil
HCL	13	10	22	Nil	1	1	Nil	Nil	Nil
MECL	23	12	35	Nil	Nil	Nil	Nil	Nil	Nil
IBM	3	46	47	Nil	2	2	Nil	Nil	Nil
GSI	24	73	94	Nil	3	3	Nil	Nil	Nil
NIRM	Nil	2	2	Nil	Nil	Nil	Nil	Nil	Nil
JNARDDC	Nil	1	1	1	Nil	Nil	Nil	Nil	Nil

Table 14.7: CIC 2nd Appeals Status (w.e.f. 1st January, 2020 to 31st December, 2020)

	No. of Cases									
Organizations	Previous	No. of 2nd Appeals	Decided							
	Pendency	filed in CIC	In favour of Appellant	In favour of Organization	Balance					
Ministry of Mines	0	6	0	6	Nil					
NALCO	0	3	0	3	Nil					
HCL	0	12	5	7	Nil					
MECL	0	2	1	1	Nil					
IBM	0	7	4	3	Nil					
GSI	3	1	1	3	Nil					
NIRM	Nil	Nil	Nil	Nil	Nil					
JNARDDC	Nil	Nil	Nil	Nil	Nil					

Government e-Market (GeM) Portal

14.56 Ministry of Mines has been procuring various items it needs through GeM portal those which are available on GeM. During Financial Year 2019-20 the Ministry procured items worth Rs.2.58 crore. Total 631 orders were placed on the GeM portal during financial year 2019-20 by the Ministry of Mines.

Days observed in the Ministry

14.57 During the year 2020 (1st January, 2020 to 31st December, 2020), list of the days observed in the Ministry of Mines is given at **Annexure 14.2**.

14.58 Commemoration of 150th Birth Anniversary of Mahatma Gandhi Ji

JNARDDC organized a drawing-cum-essay competition on the occasion of 150th birth anniversary of Mahatma Gandhi Ji. All the drawings, posters and essays were displayed in the Director Office and the participants were awarded by the Director on 26.11.2020 on Constitution Day. Director, JNARDDC also undertook a plantation drive on the above occasion. The brochure of Hon'ble Prime Minister about Constitution Day and Citizen Duties was given wide publicity.
<u>Annexures</u>

Annual Report 2020-21

Annexures

Annexure 1.1	Organizational Structure of Ministry of Mines
Annexure 1.2	Daily expenditure report for Covid - 19 - DMF funds
Annexure 2.1	Production of Selected Minerals, 2016-17 to 2020-21(Excluding Atomic & Fuel Minerals)
Annexure 2.2	Export of Ores & Minerals from 2015-16 to 2019-20 (P)
Annexure 2.3	Import of Ores & Minerals from 2015-16 to 2019-20 (P)
Annexure 2.4	Reserves/Resources of Minerals as on 1.4.2015
Annexure 2.5	Scenario of mineral rich States (Excluding Atomic & Fuel Minerals)
Annexure 6.1	Details of Elements Analysed in NGCM
Annexure 6.2	Year wise / activity-wise financial performance of GSI against the approved budget outlay during F.Y. 2019-20 and BE grant and expenditure till December, 2020 and projection of expenditure in last quarter (January, 2021 to March, 2021) of F.Y. 2020-21 and fund utilization during calendar year 2020
Annexure 6.3	Performance related to various regulatory and development functions of IBM during the year 2020 (as on 31.12.2020)
Annexure 6.4	Mineral Wise Mining Lease Distribution (Other than Atomic, Hydro Carbons Energy & Minor Minerals) as on 31.03.2019(P) (All India)
Annexure 8.1	Detailed time lines and outcomes of ongoing and completed projects of JNARDDC, Nagpur
Annexure 11.1	During FS 2020-21, total twelve items of Geological Mapping on 1:25,000 scale including one Integrated Thematic Mapping (ITM) and two RP items have been taken up in NER of which two items taken in Arunachal Pradesh, three items in Meghalaya, four items in Assam, one item in Sikkim, two items in Manipur & Nagaland. During the period from 1 st April, 2020 to 31 st December, 2020, an area of 715 sq. km and 58 Line km in RP items have been covered.
Annexure 11.2	Total three items of Geochemical Mapping on 1:50,000 Scale with collection of samples in grid pattern have been taken up during the FS 2020-21 in parts of Meghalaya, Tripura, Arunachal Pradesh and Manipur and an area of 1982 sq. km has been covered during the period from 1 st April, 2020 to 31 st December, 2020
Annexure 11.3	Total two items of Geophysical Mapping on 1:50,000 Scale have been taken up during the FS 2020-21 in parts of Meghalaya and Assam and an area of 400 sq. km has been covered during the period from 1 st April, 2020 to 31 st December, 2020
Annexure 11.4	One item of PGRS was taken up on 1:50,000 Scale during the FS 2020-21 in parts of Meghalaya and an area of 1400 sq. km has been covered during the period from 1 st April, 2020 to 31 st December, 2020
Annexure 11.5	Total 1398.25 m drilling has been done during the period from 1 st April, 2020 to 31 st December, 2020
Annexure 14.1	List of Nodal Officers, CPIOs and Appellate Authorities in Ministry of Mines
Annexure 14.2	During the year 2020 (01.01.2020 to 31.12.2020), the following days were observed in the Ministry of Mines





Annexure 1.2

Daily expenditure report for Covid - 19 - DMF funds

(As on 31st December 2020)

S. No.	Name of State	DMF fund available as on 28 th March 2020 (Rs. in crore)	Cumulative amount spent on activities related to COVID-19 since 28 th Mar 2020 (Rs. in crore)
1.	Andhra Pradesh	623.12	130.80
2.	Assam	77.50	0.65
3.	Bihar	84.50	*
4.	Chhattisgarh	1190.04	4.36
5.	Goa	187.89	22.00
6.	Gujarat	153.52	15.41
7.	Haryana	20.24	0.00
8.	Himachal Pradesh	135.66	0.43
9.	Jharkhand	1216.17	9.66
10.	Karnataka	1281.64	114.60
11.	Kerala	2.00	0.00
12.	Madhya Pradesh	1279.69	5.10
13.	Maharashtra	687.99	59.50
14.	Odisha	3274.18	99.49
15.	Punjab	26.16	0.65
16.	Rajasthan	2018.59	15.93
17.	Tamil Nadu	98.93	14.73
18.	Telangana	1001.20	*
19.	Uttar Pradesh	383.22	0.46
20.	Uttarakhand	74.39	3.49
21.	West Bengal	17.70	0.46
	Total	13834.34	497.72

Note: Total balance available in DMF as on 28th March, 2020 was ₹13816.64 cr. and 30% of this comes as ₹4145 cr. *Data has not been received.

Production of Selected Minerals, 2016-17 to 2020-21 (Excluding Atomic & Fuel Minerals)

(Value in ₹ Crore)

Ministry of Mines

	:	201	6-17	201	7-18	2018-	19 (P)	2019-	·20 (P)	2020	21 (E)
	Onit	Qty	Value	Qty	Value	Qty	Value	Qty	Value	Qty	Value
All Minerals			110845.58		131585.41		144883.77		146592.21		129949.60
Metallic			39759.61		50975.52		64042.45		66084.02		49285.22
Bauxite	th. tonnes	24745.49	1486.55	22786.11	1578.42	23687.72	1716.84	21823.79	1578.56	21239.97	1629.02
Chromite	th. tonnes	3727.78	3193.75	3480.94	3203.70	3970.69	3583.61	3929.26	3332.66	1250.25	712.72
Copper Conc.	th. tonnes	134.79	650.61	141.99	770.66	155.44	939.52	124.69	844.58	100.94	796.47
Gold	Kg	1595.00	436.24	1650.00	476.98	1664.00	524.17	1724.00	643.10	1193.00	589.08
Iron Ore	M.tonnes	194.58	25229.18	201.42	34713.10	206.45	45184.14	246.08	48107.41	188.63	34508.61
Lead Conc.	th. tonnes	268.05	966.93	306.40	1142.94	358.37	1631.68	351.27	1807.28	405.47	1889.39
Manganese Ore	th. tonnes	2395.14	1624.84	2599.81	1990.75	2820.23	2270.25	2904.37	1941.64	2120.20	1494.40
Zinc Conc.	th. tonnes	1484.24	4338.56	1539.66	4979.93	1457.17	5608.38	1446.82	6023.12	1655.46	6637.94
Other Met. Minerals			1832.95		2119.04		2583.86		1805.67		1027.59
Non-Metallic Minerals			8029.19		8855.46		9214.90		8881.77		9037.96
Diamond	Crt	36491	63.96	36491.00	37.41	36491.00	58.11	36491.00	39.81	36491.00	30.04
Garnet (abrasive)	th. tonnes	85.413	78.73	158.28	161.89	123.40	156.82	0.55	0.47	1.14	0.51
Limeshell	th. tonnes	12.344	3.48	14.77	5.14	7.54	2.78	4.60	1.87	00.00	00.0
Limestone	M.tonnes	314.669	7387.84	340.42	8099.57	379.05	8484.11	359.33	8312.02	353.47	8340.91
Magnesite	th. tonnes	299.149	74.93	195.06	59.37	146.58	39.66	97.68	35.03	73.55	28.62
Phosphorite	th. tonnes	1124.44	299.67	1515.65	366.83	1284.58	354.76	1400.19	431.91	1648.00	572.24
Sillimanite	th. tonnes	68.131	53.59	81.64	67.17	69.03	55.98	13.24	3.63	17.52	4.31
Wollastonite	th. tonnes	166.186	15.88	153.05	12.60	184.06	17.40	124.66	11.91	116.14	10.81
Other Non-Met. Min.			51.10		45.48		45.30		45.12		50.52
Minor Minerals			40976.35		52810.07		52810.07		52810.07		52810.07
M.Tonnes - Million tonnes	th.tonnes	- Thousand to	nnes Kg -	- Kilogram							

(P) Provisional.

(E) Estimated figures Note: # Includes 31 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) MCDR Minerals: MCDR returns

b) Minor Minerals: State Governments (data repeated in case of non-availability).

Export of Ores & Minerals from 2015-16 to 2019-20 (P)

(Value in ₹ '000)

Commodity	+ind	201	5-16	201	16-17	20	17-18	2018	-19 (P)	2019-	20 (P)
COILINGUIC		Quantity	Value								
		4477	59894	4774	66650	49819	427971	80436	1380078	92243	1568202
Alabaster	TON	1	1	20	240	4	41	12	130	27	256
Alumina	TON	1368528	25895763	1509463	30030427	1361385	32961497	1389106	46982494	1330038	30900412
Andalusite	TON	1	1	150	2063	9	327	100	2660	19	1240
Antimony Ores & Conc.	TON	264	115561	46	9645	4	290	0	7	I	1
Arsenic Sulphide (Natural)	TON	15	98	1	-	25	280	25	212	0	69
Asbestos	TON	524	23587	101	963	132	943	1112	33913	1001	31011
Ball Clay	TON	61536	148435	92688	233666	157738	357087	213999	497941	153660	398712
Barytes	TON	743406	6517077	1067312	7669142	1652975	9308877	2114609	11781176	2221696	12896670
Bauxite	TON	8914624	19527405	2790675	5105333	1529308	2705041	1509737	3045300	524228	1421269
Bentonite	TON	1572472	4814345	1538136	4798148	1599606	4825165	1693048	5846668	1647489	5674967
Borax	TON	1724	124646	2480	164055	3136	261796	2360	238104	2983	359857
Building and Monu- mental Stones Nes	TON	5133282	8489551	8211195	12089832	8073677	10402294	9137318	10806108	12612485	15692857
Calcite	TON	25197	177978	26981	202616	38639	289091	39248	303446	36433	273948
Chalk	TON	481	3816	661	4549	682	4296	1201	7736	1318	8022
Chromite	TON	71840	1314084	230531	3657701	81835	1743015	39273	1337693	33898	867910
Clay (Others)	TON	23340	312553	40345	459493	37616	367335	44194	428744	50367	476744
Coal (Ex Lignite)	THT	1577	9006274	1773	9669603	1504	8783040	1306	9500068	1047	5929548
Coal, Gas Water Etc. (Except Gaseous Hydrocarbons)	TON	1	66	0	95	37	1122	0	100	1	1
Coal: Lignite	ТНТ	0	2752	2	251599	2	263660	2	254653	m	319839
Cobalt Ores & Conc.	TON	0	45	0	20	0	4	1	4496	2	9478
Coke	TON	89847	1073159	77641	992814	90400	1624504	101863	2205465	111507	2383341
Copper Ores & Conc.	TON	11432	712919	22711	1054323	61005	3805458	181642	16627621	212659	20450948
Corundum (Natural)	TON		ł	1	1	-	1	101	2149	1	
Diamond		*	1427342417	* *	1627066251	*	1620221010	* *	1758167200	* *	1400336078

	:	201:	5-16	201	6-17	20	17-18	2018-	-19 (P)	2019-:	20 (P)
Commodity	Unit	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Diatomite	TON	30596	328270	38427	362899	52236	456665	27893	273001	4303	72841
Dolomite	TON	85273	155665	61021	234403	73428	377099	78011	308054	91430	349687
Earth Clay	TON	8999	87141	5792	61644	5829	63590	3651	38826	2654	18038
Emerald (Cut & Uncut)		* *	17879970	* *	20340188	* *	17756467	* *	23026249	* *	17387874
Felspar (Cut & Uncut)		**	41184	* *	239665	* *	303031	* *	338515	**	203185
Felspar (Natural)	TON	426171	2232789	481457	2495593	544667	2708372	655915	3310607	640709	3225697
Fire Clay	TON	890	10774	4325	14880	4116	30575	4665	40928	5173	41898
Flint	TON	867	7660	652	6619	824	7684	790	10393	1195	8011
Fluorspar	TON	315	11581	609	21579	470	15315	534	23413	1369	51565
Garnet (Cut and Uncut)		* *	25405	* *	241715	* *	416710	* *	494842	* *	366806
Garnet (Abrasive)	TON	480410	5950865	387277	4691844	157223	2346626	104343	1783920	74697	1254542
Granite	TON	5674506	92720731	6094325	93368593	6524819	92485120	6811734	102014067	6678118	102248518
Graphite(Natural)	TON	286	17071	404	30317	910	77567	405	22958	609	32629
Gypsum	TON	110882	291059	194493	523395	161246	593843	175274	684495	151727	578924
Iron Ore	ТНТ	5445	12639630	30731	102929256	24203	94901382	16150	92626091	36624	186092708
Kaolin	TON	304703	1105589	232867	1136296	214469	1010907	446363	1709971	431537	1929475
Kieselguhr	TON	89	1901	39	931	124	2577	62	1341	114	2399
Kyanite	TON	144	2703	153	3052	166	3404	284	4873	143	2626
Lead Ores & Conc.	TON	0	216	-	33	0	52	37	2007	ſ	202
Limestone	TON	3236004	4694273	4330820	4990064	2812257	4102279	3883757	4947501	3760405	4656559
Magnesite	TON	6207	124464	8064	135153	9576	188593	6273	204287	5459	147075
Manganese Ore	TON	443	18947	245	12377	44167	508784	55845	138120	58198	254643
Marble	TON	289851	5998439	326967	7048202	355892	7669792	385247	8757384	310619	9010920
Mica	TON	135810	4229710	135172	4555657	155111	6193284	152514	6200097	116874	4909146
Molybdenum Ores & Conc.	TON	45	2199	22	1006	7	1923	9	81	ε	3023
Natural Gas	TON	126950	3798602	37072	1521058	179552	6315314	73574	3802681	52408	2202387
Nickel Ores & Conc.	TON	124	11511		1	0	19	50	1618	0	0
Niobium or Tantalum Ores & Conc.	TON	I	1	2	7278	0	213	0	790	361	943
Ochre	TON	3633	75049	3359	78715	4519	96069	3496	65048	2939	72042

Annual Report 2020-21

	1	201.	5-16	201	l6-17	20	17-18	2018	-19 (P)	2019-	20 (P)
Commodity		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Other Minerals Nes	TON	1362346	1200058	757362	1663192	1670511	2298247	3817139	5538148	3643830	4587045
Precious & Semi- Precious Stones (Cut & Uncut)		*	12590238	* *	11080272	* *	12656409	* *	14493864	*	12083061
Precious Metal Ores & Concentrates	ВХ	144050	3167	5743	72	116000	792	50001	484	I	1
Quartz and Quartzite	TON	388188	3025917	488796	3579275	556435	4305601	793395	5702080	944043	6087299
Rock Phosphate	TON	14242	96069	5915	8615	395	599	1652	46795	257	2013
Salt (Other Than Common Salt)	TON	5926639	6701178	7897940	7450781	9969604	9402718	12755391	14627309	11681713	13681151
Sand (Excl. Metal Bearing)	TON	14477	491908	17284	369426	32444	419869	3394	24454	1895	32609
Sandstone	TON	744651	10161784	710393	9071316	933455	12329002	1032374	13570943	795760	10434174
Silica Sand	TON	710	6727	1097	8667	2748	22159	3152	27794	2392	14932
Sillimanite	TON	15078	110846	14064	114679	16193	171833	9866	111874	1026	14963
Slate	TON	97583	1927309	122089	2343205	86297	1954270	80536	2180256	61145	1983355
Steatite	TON	187289	2709697	251546	3456145	244760	3580879	259522	3764812	250651	3583310
Sulphur (Exc. Sub- limed Precipitated & Colloidal)	TON	628164	5157083	616473	3469351	573856	4254427	479651	4332476	802175	3872833
Tin Ores & Conc.	TON	0	14	ł	1	0	m	0	54	0	1
Titanium Ores & Conc.	TON	790489	6644934	532201	5716718	355475	6010132	359974	6566846	246203	4995764
Tungsten Ores & Conc.	TON	-	391	7	6064	30	29880	34	43180	I	-
Vanadium Ores & Conc.	TON	1	1	0	25	l	1	10	2320	10	10801
Vermiculite	TON	528	6402	757	8313	453	2093	583	7250	634	2062
Witherite	TON	0	241	0	217	∞	319	0	87	0	156
Wollastonite	TON	16616	279263	16699	293525	12479	224918	13786	279115	14583	298589
Zinc Ores & Conc.	TON	558	11345	53912	3990176	1206	31460	2079	71170	317	15827
Zirconium Ores & Conc.	TON	4859	241901	1693	95182	308	31131	89	4470	1	78
Total		*	1709465350	* *	2001306860	* *	1994690164	* *	2191682101	* *	1896831610
Source: GCI&S, Kolkata(/	As on 10-	10-2020)	P: Provisional,		:Nil,	+	- : Negligible	* *	: Not additive		

Annexures

Annual Report 2020-21

Ministry of Mines

Import of Ores & Minerals from 2015-16 to 2019-20 (P)

(Value in ₹ '000)

	:	201	5-16	201	16-17	50.	17-18	2018	3-19 (P)	201	9-20 (P)
Commodity		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
		5298	63748	4716	54480	5386	68022	4942	74317	4235	59874
Alabaster	TON	970	24062	1055	28667	1145	28996	1378	39474	1040	32801
Alumina	TON	998447	22924844	1403570	33417504	2224194	60483412	2856522	102946451	1844483	49829389
Andalusite	TON	14072	306082	10909	222533	14375	318253	14263	355231	17617	425962
Antimony Ores & Conc.	TON	5330	924221	4756	752104	5257	1093067	7496	1609648	7655	1265983
Arsenic Sulphide (Natural)	TON	ъ	297	12	811	20	1155	7	557	7	995
Asbestos	TON	355686	14865511	310593	11279370	357182	11603678	364105	12253120	361164	12432335
Ball Clay	TON	170495	1298485	173358	1368664	197848	1514694	175253	1579468	126795	1115238
Barytes	TON	8433	189198	8817	202527	10982	237166	11497	266738	15438	427966
Bauxite	TON	1116010	5982901	1894926	7785093	1461494	7727097	2254595	13364138	2246682	10817757
Bentonite	TON	15225	353710	28615	477966	48963	657248	57232	868080	72619	882272
Borax	TON	133552	4429452	129409	4359797	160135	4753977	181628	5886239	176421	5644323
Building and Monumental Stones Nes	TON	548030	1138893	147856	506698	103829	418409	201755	850407	47976	523955
Calcite	TON	43812	219917	54563	264364	74153	353344	71712	346402	63457	302799
Chalk	TON	6173	46310	8211	48114	6989	36764	255	6142	105	4131
Chromite	TON	187662	2266406	154226	2105121	160505	2981861	162663	3154446	124693	2065046
Clay (Others)	TON	19484	266435	18997	261132	24338	302247	17482	319967	20966	317309
Coal (Ex Lignite)	THT	204002	861073457	191015	1003162925	208254	1384845575	235355	1709323907	248546	1527478150
Coal, Gas Water Etc.(Except Gas- eous Hydrocarbons)	TON	0	75	I	1	2	29	I	I	l	1
Coal: Lignite	ТНТ	0	5518	0	652	0	1335	-	8171	-	5170
Cobalt Ores & Conc.	TON	25	44193	I	1	1	1	1	4476	2	9253
Coke	TON	3019502	31956111	4368062	54356105	4589015	91542188	4933340	120756971	2912775	61067395

		201	15-16	201	16-17	20	17-18	2018	3-19 (P)	2019)-20 (P)
Commodity		Quantity	Value								
Copper Ores & Conc.	TON	1886200	262965392	1143216	182986972	1488164	278344776	823938	121462018	821555	86675247
Corundum (Natural)	TON	1	1	0	18	~	29	I	I	ł	1
Diamond		* *	1105651211	* *	1296740694	* *	1902035828	* *	1779709899	**	1487354321
Diatomite	TON	2024	87085	3143	113037	2426	88318	3648	139463	4950	15228
Dolomite	TON	1931982	2998295	2010665	2999703	5360753	5636086	5869536	6743267	5539814	6555288
Earth Clay	TON	107	850	598	3525	43	1845	19	4255	2	343
Emerald (Cut & Uncut)		* *	87263267	* *	113428797	* *	77934747	* *	36592286	**	24403507
Felspar (Cut & Uncut)		* *	21267	* *	46896	* *	48136	* *	96750	* *	83631
Felspar (Natural)	TON	30840	177877	35582	161647	16753	147950	9490	100612	8200	101217
Fire Clay	TON	563	16839	1828	60726	1765	110852	1294	88523	1896	100242
Flint	TON	1279	17412	1712	24263	4431	56232	6887	76018	6279	62363
Fluorspar	TON	163113	2908708	190444	2992256	221817	3958978	265445	7281830	239589	7225936
Garnet (Cut and Uncut)		* *	62629	* *	222296	* *	335898	* *	169836	* *	184468
Garnet (Abrasive)	TON	883	11053	2286	22192	2256	21243	422	6410	391	6188
Granite	TON	70288	2474283	51422	1683156	60339	1760529	61962	1940630	56172	1846957
Graphite (Natu- ral)	TON	26160	1213356	37044	1391090	39864	1487947	47053	2328880	41405	1863219
Gypsum	TON	4068411	5713627	4423809	6051111	5740956	8254197	6186250	9473422	5460744	8415197
Iron Ore	ТНТ	7099	31971444	4607	21615220	8707	42293970	12808	59136712	1246	9409772
Kaolin	TON	120461	1996778	142929	2393952	192539	2787447	229734	3581703	231666	3933899
Kieselguhr	TON	0	73	-	140	~	66	42	3995	99	9246
Kyanite	TON	478	16913	748	16619	620	17807	266	27590	1112	33476
Lead Ores & Conc.	TON	5334	264662	6217	318696	2220	149370	1499	85467	3283	166726
Limestone	TON	17187165	23772767	18300357	24384184	20827698	29016416	24397170	36665169	25639511	37429912
Magnesite	TON	118788	3256837	142600	3089942	229628	5268655	464367	11120844	365054	9468162
Manganese Ore	TON	2216864	17413686	1943815	24028136	3627741	50633963	2784473	48484512	4316572	41282102
Marble	TON	858436	27392156	882266	26142984	1164246	22696788	997198	20190592	951361	17923701

Annexures

Annual Report 2020-21

Ministry of Mines

		201	5-16	201	16-17	50.	17-18	201	8-19 (P)	201	9-20 (P)
Commodity	LINU LINU	Quantity	Value								
Mica	TON	4306	895587	3260	944981	4313	1079664	3692	1172725	3649	1280927
Molybdenum Ores & Conc.	TON	7511	4903722	7138	5442499	9169	8149458	11028	13606784	7901	9809779
Natural Gas	TON	14376925	437824475	17783327	402490252	20176813	523664503	21544662	738878610	24416607	684667281
Nickel Ores & Conc.	TON	3296	2453862	1062	818095	1	1	0	169	0	204
Niobium or Tantalum Ores & Conc.	TON	191	246581	168	284036	185	228699	155	264454	16	21764
Ochre	TON	137	33919	123	19061	56	14580	40	11794	189	35754
Other Minerals Nes	TON	59204	805956	299442	1590851	536328	2082737	683347	2821851	641541	2995670
Petroleum (Crude)	THT	202314	4293999334	214887	4742189327	218107	5630977107	226453	7981583187	220870	7281122511
Precious & Semi-Precious Stones(Cut & Uncut)		* *	21000375	* *	24660619	* *	46165232	* *	48292004	* *	41191158
Precious Metal Ores &Concen- trates	U Y	78599	13649488	83322	19423078	15298	3363976	201	160	273	736
Quartz and Quartzite	TON	7888	43801	382	12001	976	22057	1663	54630	1156	40684
Rock Phosphate	TON	8037745	65290422	7511446	49513135	7702634	45457007	7519156	56379205	7654868	54205952
Salt (Other Than Common Salt)	TON	55644	173742	52900	173685	67555	291752	78712	472880	65261	466170
Sand (Excl. Metal Bearing)	TON	165150	375079	31667	140870	361957	530106	390327	843983	198864	502133
Sandstone	TON	1940	3101	0	21	203	4162	48	973	28	693
Silica Sand	TON	18786	226225	102432	516412	130185	475197	60898	400143	21392	218842
Sillimanite	TON	214	9043	24	3029	18	1027	98	2403	609	10780
Slate	TON	133	11295	18	5323	139	9623	225	6869	111	3816
Steatite	TON	5038	198579	3592	204909	4548	249142	7028	324573	5811	325940
Sulphur (Exc. Sublimed Precipitated & Colloidal)	TON	1432632	14172608	1345520	8751425	1206433	10628788	1346777	15219696	1235103	8239655

	1	201	15-16	20.	16-17	20	17-18	2018	8-19 (P)	201	9-20 (P)
Commodity		Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Tin Ores & Conc.	TON	82	58039	69	37335	57	56980	9	1259	0	206
Titanium Ores & Conc.	TON	106420	1637170	39443	867777	163690	3297464	97307	3013233	138044	3965291
Tripoli Earth	TON	20	825	19	817	0	Ø	Ø	238	19	1115
Tungsten Ores & Conc.	TON	62	34081	283	29631	350	23609	461	64519	447	69235
Vanadium Ores & Conc.	TON	64	6301	269	15868	491	89745	2658	451826	7005	349104
Vermiculite	TON	439	15092	552	14413	321	7415	610	16154	416	11024
Witherite	TON	0	20	I	1	1	1	0	95	7	263
Wollastonite	TON	2819	53216	3483	73052	11461	156398	26484	331612	22618	294799
Zinc Ores & Conc.	TON	385	18722	1771	86640	1	-	1422	38776	101	2667
Zirconium Ores & Conc.	TON	53208	3691652	73931	4569039	83780	6202747	76078	8084379	56168	6073419
Total		**	7387880608	**	8094451067	**	10285285803	* *	12991864212	**	11515303020
Source: DGCI&S, K	olkata (,	As on 10-10-:	2020); P: Provis	sional;	:Nil;	÷	+ : Negligible;	**: Not adc	litive		

Annexures

Ministry of Mines

Reserves / Resources of Minerals as on 1.4.2015

Mineral	Unit		Resei	rves				Rem	aining Resou	rces				Total
		Proved	Probe	able	Total	Feasibility	Pre-fea	sibility	Measured	Indicated	Inferred	Reconna issance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Andalusite	000' tonnes	0	0	0	0	0	0	0	0	0	4000	24201	28201	28201
Antimony														
Ore	tonnes	0	0	0	0	0	0	0	0	0	10588	0	10588	10588
Metal	tonnes	0	0	0	0	0	0	0	0	0	174	0	174	174
Apatite	tonnes	27715	0	1680	29395	1385734	491818	1225345	2281521	11481250	6132768	1017646	24016082	24045477
Asbestos	tonnes	20016	0	4617	24633	2488167	3114728	4064178	100687	2527959	10569233	57800	22922751	22947384
Ball Clay	tonnes	33526297	11182801	4784522	49493621	11045214	4286560	13437994	624977	2497880	53357091	0	85249716	134743337
Barytes	tonnes	50449000	49358	848467	51346825	410466	323345	1258521	205834	1284390	31735548	105721	35323825	86670650
Bauxite	000' tonnes	434043	18599	203780	656422	254378	132633	382369	710878	430890	1209706	119588	3240442	3896864
Bentonite	tonnes	13926227	50000	609406	14585633	6838864	2721697	68632472	26519818	225744237	212115692	25730000	568302781	582888414
Borax	tonnes	0	0	0	0	0	0	0	0	0	0	74204	74204	74204
Calcite	tonnes	928119	798170	1722578	3448867	1332076	217790	3339239	9122696	1241494	4204311	97476	19555082	23003949
Chalk	000' tonnes	4215	529	319	5064	741	331	151	196	0	269	0	1687	6751
China Clay	000' tonnes	140456	36144	52869	229469	107176	42220	98627	289723	415703	1685730	72599	2711777	2941247
Chromite	000' tonnes	64465	12815	24930	102210	67618	15780	33506	26914	33076	44458	20452	241806	344016
Cobalt Ore	mill. tonnes	0	0	0	0	0	0	0	30.63	2	0.28	12	44.91	44.91
Copper Ore														
Ore	000' tonnes	162972	0	44796	207767	44925	31090	59209	158300	232654	772912	4640	1303730	1511498
Metal	000' tonnes	2127.9	0	606.72	2734.62	382.18	324.55	585.42	1950.87	2050.98	4100.36	29.17	9423.53	12158.15
Corundum	tonnes	200	0	0	200	70844	1073	63060	13	38	105794	52675	293497	293697
Diamond	Carats	959500	0	159	959659	0	0	0	304601	1524317	29047514	0	30876432	31836091

Mineral	Unit		Reser	ves				Rem	aining Resour	rces				Total
		Proved	Proba	able	Total	Feasibility	Pre-fea	sibility	Measured	Indicated	Inferred	Reconna issance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Diaspore	tonnes	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	tonnes	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	tonnes	224824	63860	0	288684	4976749	745390	571311	1713833	6218421	3522537	145183	17893423	18182107
Fuller's Earth	tonnes	3941000	0	0	3941000	0	0	58200	0	912340	256467419	0	257437959	261378959
Garnet	tonnes	9917936	278493	2587427	12783856	84320	1643412	3287667	121099	10247428	27992906	333	43377166	56161022
Gold														
Ore(Primary)	tonnes	10404349	6401725	422100	17228174	1925669	1303000	1968176	30333248	70136727	233608305	145336333	484611458	501839632
Metal (Primary)	tonnes	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)	tonnes	0	0	0	0	0	0	0	0	2552000	23569000	0	26121000	26121000
Metal (Placer)	tonnes	0	0	0	0	0	0	0	0	2.29	3.57	0	5.86	5.86
Granite (Dimension Stone)	th. cu.m	35741	201377	26574	263692	38462	51990	8234	837325	2063964	42543908	512216	46056098	46319790
Graphite	tonnes	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 (Heamatite)	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
Kyanite	tonnes	639121	0	48958	688079	1505114	568205	2193427	579619	3577402	95869713	0	104293480	104981559
Laterite	000' tonnes	98598	12527	13608	124733	49655	8960	22724	3532	2626	243535	250787	581819	706552

Unit		Reser	ves				Rem	aining Resoul	rces				Total
	Proved	Probe	ible	Total	Feasibility	Pre-fea	sibility	Measured	Indicated	Inferred	Reconna issance	Total	Resources
	STD111	STD121	STD122	(Þ)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
	31662	68687	5767	106116	5564	17411	31297	37055	192083	355403	4530	643343	749459
	624.56	1666.02	191.76	2482.34	119.31	521.74	780.56	690.65	2171.43	6237.67	0	10521.36	13003.7
	2871.75	6728.14	399.63	9999.52	364.08	940.26	1362.05	1941.94	7931.06	13722.2	101.65	26363.24	36362.76
	0	0	0	0	0	0	0	0	0	120.76	22.37	143.13	143.13
	9438939	3015917	3880897	16335753	4870440	4852713	8623172	7111337	22629060	130787772	8014504	186888998	203224752
	77867	165	4244	82276	6210	9345	45574	59010	59652	131707	213	311711	393988
	62982	19715	10778	93475	70742	44606	73823	18189	42803	135722	16513	402399	495874
	0	0	4551	4551	104236	202003	72387	0	107129	1453386	2200	1941341	194589
	117115856	4650000	2090000	123855856	11704870	0	0	0	0	0	0	11704870	135560726
	82187635	20035595	12209547	114432777	38252500	10605400	124089303	143353477	56528016	14446953	3593715	520869364	63530214
	0	0	0	0	0	1500000	0	36000	569304	17098594	167800	19371698	1937169
	0	0	0	0	0	1050	0	83	287	11198.03	50.34	12668.37	12668.37
	0	0	0	0	0	21	21	31	53	63	0	189	180
	21959552	4448341	10525912	36933805	44924890	13936202	31896176	2559245	3560819	32369262	1612607	130859201	167793006
	0	0	0	0	140	683	595	0	0	0	988	2406	2406
	0	0	0	0	0	0	0	0	7.71	6.5	1.5	15.71	15.7
÷													
10	0	0	0	0	0	0	0	0	18142	3660	707	22508	22508

Mineral	Unit		Reser	ves				Rem	aining Resoul	rces				Total
		Proved	Proba	ble	Total	Feasibility	Pre-fea:	sibility	Measured	Indicated	Inferred	Reconna issance	Total	Resources
		STD111	STD121	STD122	(A)	STD211	STD221	STD222	STD331	STD332	STD333	STD334	(B)	(A+B)
Pyrite	000' tonnes	0	0	0	0	27129	0	32597	9590	77729	1527356	0	1674401	1674401
Pyrophyllite	tonnes	16575493	4322386	4035079	24932958	9539407	8301411	4240016	1118943	3589624	7533340	360006	34682745	59615703
Quartz & Silica Sand	000' tonnes	433014	93339	121169	647522	354566	368216	362128	36872	219180	1897899	21436	3260298	3907819
Quartzite	000' tonnes	47758	2016	33698	83472	120723	141437	160355	119953	152715	868850	11293	1575325	1658798
Rare Earth Elements	tonnes	0	0	0	0	0	0	0	0	6353	19140	0	25493	25493
Rock Phosphate	tonnes	43832936	5179	1969370	45807485	10679080	36271671	25008353	2912633	3549750	185771368	2678275	266871130	312678615
Rock Salt	000' tonnes	0	0	0	0	10035	0	2990	0	0	0	0	16025	16025
Ruby	Kg	0	0	0	0	0	429	3296	0	0	1623	0	5349	5349
Sapphire	Kg	0	0	0	0	0	0	0	0	0	450	0	450	450
Shale	000' tonnes	15027	171	274	15472	495	0	2022	0	0	1175	90	3781	19253
Sillimanite	tonnes	323231	5728868	450016	6502115	1020187	135278	20257525	4580083	17790664	16068690	3849600	63702027	70204142
Silver														
Ore	tonnes	69277075	8413000	72753828	150443903	0	1484543	46726460	29632000	64946000	218721729	0	361510732	511954635
Metal	tonnes	4309.78	220.77	2641.39	7171.94	0	42.85	259.62	2037.99	3236.39	17233.03	0	22809.88	29981.82
Slate	000' tonnes	19619	667	0	20286	0	0	1075	0	0	1511	0	2586	22872
Sulphur (Native)	000' tonnes	0	0	0	0	0	0	0	0	0	210	0	210	210
Talc / Steatite / Soapstone	000' tonnes	72172	8067	26251	106490	18178	13020	3221	2994	8126	128620	6275	209434	315924
Tin														
Ore	tonnes	2067	897	1455	4419	22594200	2653	31330072	168457	561080	29064288	0	83720749	83725168
Metal	tonnes	44.56	94.02	15.62	154.2	33139.45	842.8	54049.65	813.29	231.63	13182.34	0	102259.16	102413.36
Titanium Minerals	tonnes	13552280	0	868436	14420716	19311670	31365	117416	2198668	52373956	325171754	0	399204829	413625545
llmenite	tonnes	12980540	0	832970	13813510	17294168	0	0	1242214	41973121	280193087	0	340702590	354516100

Resources 64594.01 142094.35 (A+B) Total 142094.35 64594.01 Total 4566.28 Reconna issance STD334 103415.15 54133.29 Inferred STD333 487.2 20180.92 Indicated STD332 **Remaining Resources** 9914.00 Measured STD331 6032.4 450.00 **STD222 Pre-feasibility** 0.00 STD221 3568.00 1106.12 Feasibility STD211 Total ₹ **STD122** Reserves Probable **STD121** Proved STD111 tonnes Unit Wollastonite Titaniferous Contained WO3 Contained V205 Not known Vermiculite Magnetite Leucoxene Tungsten Vanadium Mineral Anatase Zircon Rutile Ore Ore

Annexure 2.5

Scenario of Mineral Rich States

(Excluding Atomic & Fuel Minerals)

Name of the Value of min-Le State eral production in 2019-20 (Rs. In crore)	 Value of min- Le eral production in 2019-20 (Rs. In crore) 	Ľ	ading minerals produced in the State *	Value of minor minerals produc- tion in 2019-20 (Rs. In crore) #	No. of reporting mines dur- ing 2019-20	Share of the State in country's production of certain minerals *
Odisha 32841 Bauxite, Chromite, M Ore, Sulphur, Iron Ore Ore, Sulphur, Iron Ore (Abrasive), Graphite (Sillimanite, Limestone	32841 Bauxite, Chromite, M Ore, Sulphur, Iron Ore (Abrasive), Graphite (Sillimanite, Limestone	Bauxite, Chromite, M Ore, Sulphur, Iron Ore (Abrasive), Graphite (Sillimanite, Limestone	anganese 2, Garnet R.O.M.), 1, Iolite	8	129	Chromite (100%), Iolite (100%), Bauxite (70.95%), Iron Ore (59.64%), Graphite (39.28%), Manganese Ore (18.51%), Limestone (1.57%),
Rajasthan 22776 Lead & Zinc Ore, Zinc Ore, Zinc Ore, Phosphor Copper Ore, Wollastor Lead Conc., Wollastor ceous Earth, Limeston Conc., Manganese Or (Abrasive), Selenite, Irc	22776 Lead & Zinc Ore, Zinc Copper Ore, Phosphor Lead Conc., Wollastor ceous Earth, Limeston Conc., Manganese Or (Abrasive), Selenite, Irc	Lead & Zinc Ore, Zinc Copper Ore, Phosphor Lead Conc., Wollastor ceous Earth, Limeston Conc., Manganese Or (Abrasive), Selenite, Irc	Conc, ite, Silver, lite, Sili- e, Copper e, Garnet on Ore	10275	84	Garnet (100%), Lead & Zinc Ore (100%), Lead Concentrate (100%), Selenite (100%), Siliceous Earth (100%), Wollastonite (100%), Zinc Con- centrate (100%), Silver (99.96%), Phosphorite (92.86%), Copper Concentrate (41.57%), Copper Ore (28.33%), Limestone (20.14%)
Andhra17906Manganese ore, LimePradeshIron Ore, Vermiculite, (abrasive)	17906 Manganese ore, Lime Iron Ore, Vermiculite, (abrasive)	Manganese ore, Lime Iron Ore, Vermiculite, (abrasive)	stone, Garnet	16861	123	Vermiculite (78.95%), Limestone (11.84%), Manga- nese Ore (11.4%), Iron Ore (0.33%)
Chhattisgarh 12032 Bauxite, Limestone, S Iron Ore, Tin Concent Moulding Sand	12032 Bauxite, Limestone, S Iron Ore, Tin Concent Moulding Sand	Bauxite, Limestone, S Iron Ore, Tin Concenti Moulding Sand	illimanite, ates,	907	92	Moulding Sand (100%), Tin Concentrate (100%), Iron Ore (14.1%), Limestone (11.88%), Bauxite (7.18%)
Telangana 11295 Limestone, Manganese	11295 Limestone, Manganese	Limestone, Manganese	e Ore	10774	92	Limestone (7.28%), Manganese Ore (0.27%),
Karnataka 9044 Gold Ore, Manganese Limestone, Iron Ore, I Gold Primary, Limeshe	9044 Gold Ore, Manganese Limestone, Iron Ore, I Gold Primary, Limeshe	Gold Ore, Manganese Limestone, Iron Ore, I Gold Primary, Limeshe	e Ore, Magnesite, ell	915	140	Gold Ore (100%), Gold Primary (100%), Limeshell (22.11%), Iron Ore (12.76%), Manganese Ore (11.48%), Kyanite (11.44%), Limestone (9.5%), Magnesite (7.37%)
Madhya 8152 Copper Ore, Mangar Pradesh Eauxite, Phosphorite Concentrate, Limesto mond, Iron Ore	8152 Copper Ore, Mangar Bauxite, Phosphorite Concentrate, Limesto mond, Iron Ore	Copper Ore, Mangar Bauxite, Phosphorite Concentrate, Limesto mond, Iron Ore	nese Ore, Copper one, Dia-	5646	220	Diamond (100%), Copper Ore (64.38%), Copper Concentrate (52.2%), Manganese Ore (32.99%), Limestone (13.07%), Phosphorite (7.14%), Bauxite (3.14%), Iron Ore (1.35%)
Gujarat 7403 Bauxite, Marl, Limest	7403 Bauxite, Marl, Limest	Bauxite, Marl, Limest	one	6750	167	Marl (76.17%), Bauxite (9.5%), Limestone (6.36%)
Maharashtra 5718 Manganese Ore, Bau Limestone, Sillimanit Fluorite (Graded)	5718 Manganese Ore, Bau Limestone, Sillimanit Fluorite (Graded)	Manganese Ore, Bau Limestone, Sillimanit Fluorite (Graded)	ixite, e, Kyanite,	4594	67	Fluorite (Graded) (100%), Sillimanite (100%), Kya- nite (88.56%), Manganese Ore (24.8%), Limestone (4.07%), Bauxite (2.73%), Iron Ore (0.46%)
Uttar Pradesh 5689 Sulphur, Limestone	5689 Sulphur, Limestone	Sulphur, Limestone		5614	2	Limestone (0.78%)
-	 					

* Except minor minerals. # Figures repeated due to non-availability of data from State Governments.

Details of Elements Analysed in NGCM

Packages	Instruments	Elements to be detected
A	XRF (24 elements)	$SiO_2(1000 \text{ ppm}), Al_2O_3(1000 \text{ ppm}), Fe_2O_3(1000 \text{ ppm}), TiO_2(100 \text{ ppm}), CaO(1000 \text{ ppm}), MgO (1000 \text{ ppm}), MnO(30 \text{ ppm}), Na_2O (1000 \text{ ppm}), K_2O (1000 \text{ ppm}), P_2O_5 (100 \text{ ppm}), Ba (50 \text{ ppm}), Co (1 \text{ ppm}), Cr(15 \text{ ppm}), Cu(1 \text{ ppm}), Ga (5 \text{ ppm}), Nb (5 \text{ ppm}), Ni (2 \text{ ppm}), Pb (2 \text{ ppm}), Sc (3.5 \text{ ppm}), Sr (5 \text{ ppm}), V (20 \text{ ppm}), Y (5 \text{ ppm}), Zn (10 \text{ ppm}), Zr (5 \text{ ppm}).$
В	GF-AAS	Au (1 ppb)
D	AAS with FIAS	Se (0.2 ppm)
E	ISE	F (100 ppm)
F	GF-AAS	Cd (0.1 ppm), Ag (0.02 ppm)
G	DMA	Hg (5 ppb)
H (Fusion Method)	ICP-MS (23 elements)	14 REE viz. La (1 ppm), Ce (2 ppm), Pr (0.5 ppm), Nd (0.5 ppm), Sm (0.5 ppm), Eu (0.5 ppm), Gd (0.5 ppm), Tb (0.5 ppm), Dy (0.5 ppm), Ho (0.5 ppm), Er (0.5 ppm), Tm (0.5 ppm), Yb (0.5 ppm), Lu (0.5 ppm) and 9 other elements, viz. U (0.5 ppm), Ta (0.2 ppm), Ge (0.05 ppm), Be (0.3 ppm), Hf (0.5 ppm), Sn (1 ppm), As (1 ppm), Rb (3 ppm), Th (4 ppm).
1	FA – ICPMS/GFAAS	Pt (0.3 ppb) & Pd (0.2ppb) {Analysis of this package is on hold since 2001-2002 due to non-adherence of desired LLD}.
J(Acid Di- gestion method)	ICP-MS (9 elements)	In (0.03 ppm), Tl (0.05 ppm), Cs (2 ppm), W (0.5 ppm), Mo (0.5ppm), Sb (0.2 ppm), Bi (0.1 ppm), Te (0.02 ppm), Li (5 ppm).
Water (A)		pH, EC, HCO ₃ ⁻ , Cl ⁻ , SO ₄ ⁻² , NO ₃ ⁻ , Ca ⁺² , Na ⁺¹ , K ⁺¹ , PO ₄ , SiO ₂ (up to ppm level)
Water (B)	ICP-MS	Li (10 ppb), Be (0.1 ppb), Al (25 ppb), Sc (10 ppb), Ti (5 ppb), V (5 ppb), Cr (5 ppb), Mn (0.5 ppb), Co (0.05 ppb), Ni (1 ppb), Cu (0.5 ppb), Zn (2 ppb), Ga (0.1 ppb), As (1 ppb), Rb (0.1 ppb), Sr (0.1 ppb), Y (0.01 ppb), Mo (0.5 ppb), Ru (0.02 ppb), Rh (0.01 ppb), Ag (0.02 ppb), Cd (0.01 ppb), Sn (0.3 ppb), Sb (0.02 ppb), Cs (0.02 ppb), Ba (1 ppb), La (0.03 ppb), Ce (0.04 ppb), Pr (0.01 ppb), Nd (0.03 ppb), Sm (0.03 ppb), Eu (0.03 ppb), Gd (0.02 ppb), Tb (0.01 ppb), Dy (0.01 ppb), Ho (0.01 ppb), Er (0.01 ppb), Tm (0.01 ppb), Yb (0.01 ppb), Lu (0.01 ppb), Hf (0.05 ppb), Ta (0.03 ppb), W (0.5 ppb), Ir (0.01 ppb), Pt (0.03 ppb), Au (0.01 ppb), Tl (0.01 ppb), Pb (0.5 ppb), Bi (0.02 ppb), U (0.02 ppb) Fe (100 ppb).
Water (C)		Hg, F (upto ppb level)

Presently analysis under package C is not carried out, instead Li, which was earlier analysed under Package C is included in Package J.

BE grant and expenditure till December, 2020 and projection of expenditure in last quarter (January, 2021 to March, 2021) of F.Y. 2020-21 and fund utilization during calendar year 2020 Year wise / activity-wise financial performance of GSI against the approved budget outlay during F.Y. 2019-20 and

(In crore)

			EY 2	019-20					FY 2020	-21		Calenda	r Year 2020
	Total BE Grant	Total RE Grant	Expendi ture (April,19 to Dec,19)	Available RE Grant from Jan,20 to Mar, 2020	Expendi ture from Jan,20 to Mar, 2020	Total Expendi ture	Total BE Grant	Total RE Grant	Actual Expendi ture (April, 20 to Dec, 20)	% of expendi ture till Dec.2020	Projection of expenditure for last quarter (Jan,21 to Mar,21)	Budget from Jan 2020 to Dec, 2020	Expenditure from January 2020 to Dec, 2020
Activities	-	2	m	4 (2-3)	2	6 (3+5)	7	ω	6	10	11 (8-9)	12 (4+9)	13 (5+9)
Survey & Mapping (Mission-I)	109.85	132.30	120.90	11.40	10.53	131.43	149.00	132.85	122.64	92.31	10.21	134.04	133.17
Mineral Exploration (Mission-II)	45.65	37.05	28.80	8.25	7.54	36.34	43.00	32.05	27.24	84.99	4.81	35.49	34.78
Information Dissemination (Mission- III)	78.46	39.45	32.13	7.32	6.26	38.39	77.26	48.85	44.31	90.71	4.54	51.63	50.57
Spl. Investigation & Other Exploration (Antarctica) (Mission-IV)	2.52	2.04	1.61	0.43	0.32	1.93	2.50	1.99	1.68	84.42	0.31	2.11	2.00
Research & Development (Mission-IV)	12.15	10.05	8.01	2.04	1.71	9.72	17.80	8.95	7.84	87.60	1.11	9.88	9.55
Human Resource Development (Mission-V)	75.47	75.20	2.52	72.68	15.03	17.55	3.30	0.60	0.55	91.67	0.05	73.23	15.58
Tribal Area Sub Plan (TSP)	24.00	24.00	16.51	7.49	7.29	23.80	22.00	22.00	15.68	71.27	6.32	23.17	22.97
Schedules Caste Sub Plan (SCSP)*	45.00	45.00	8.38	36.62	11.70	20.08	42.20	42.20	24.53	58.13	17.67	61.15	36.23
Administrative Support Activities (ASA)	106.08	66.06	73.48	17.51	16.34	89.82	111.90	84.50	74.83	88.56	9.67	92.34	91.17
Establishment Expenditure	722.35	704.81	573.25	131.56	119.54	692.79	772.72	688.60	568.44	82.55	120.16	700.00	687.98
Total Revenue Fund	1221.53	1160.89	865.59	295.3	196.26	1061.85	1241.68	1062.59	887.74	83.54	174.85	1183.04	1084.00
Capital (Modernization & Replacement)	101.4	80.7	57.79	22.91	21.96	79.75	108.3	52.42	37.54	71.61	14.88	60.45	59.50
Total (Rev + Capital)	1322.93	1241.59	923.38	318.21	218.22	1141.60	1349.98	1115.01	925.28	82.98	189.73	1243.49	1143.50
% of Utilisation of Fund against RE			74.37			91.95			82.98				

*Scheduled Caste Sub Plan (SCSP) head introduced in FY 2019-20

Performance related to various regulatory and development functions of IBM during the year 2020 (as on 31.12.2020)

Sl. no.	ltem	Annual Target	Achievement
1	Inspections (MCDR/MP/ RMP/FMCP)	977	956
2	Updating of National Mineral Inventory (NMI) adopting UNFC.	Release of NMI for all the minerals	Quinquennial updating of NMI as on 01.04.2020 for 46 major minerals has been initiated. The processing, generation of output and preparation of comparative statement for finalization of NMI as on 01.04.2020 in respect of 01 mineral is completed and 03 minerals are under progress
3	Preparation of multi-mineral maps with forest overlays	100	Multi mineral leasehold maps which were earlier prepared in Autocad, now updated on Arc GIS Platform . Vectorization of 474 toposheets and plotting of 3410 M.L completed
4	OD Investigations	50	44.50
5	Chemical Analysis (No. of radicals)	30,000	14793
6	Mineralogical Studies	2000	2217
7	In Plant Studies/ Plant visits		1
8	Technical Consultancy & Mining Research Activity		One Regional Mineral Development study was taken up. Report for effective utilization of iron ore fine dump of NMDC, Bailadila was prepared and is under review by competent authority.
9	Training programmes by IBM.	12	5

Mineral Wise Mining Lease Distribution

(Other than Atomic, Hydro Carbons Energy & Minor Minerals) as on 31.03.2019(P) (All India)

SI. No.	Mineral	No. of Leases	Lease area (Hect.)
1	Amethyst	3	6.63
2	Apatite	1	16.12
3	Aquamarine	1	24.29
4	Bauxite	372	30520.59
5	Borax	1	159.00
6	Chromite	27	7687.85
7	Copper ore	14	4250.05
8	Diamond	2	275.96
9	Emerald	1	46.32
10	Epidote	1	4.05
11	Flint stone	2	11.77
12	Fluorite	11	331.19
13	Garnet	31	188.18
14	Garnet(gem)	2	38.22
15	Gold	11	6971.89
16	Graphite	37	1581.56
17	lolite	5	61.79
18	Iron ore	426	65842.07
19	Kyanite	27	1471.44
20	Lead & zinc ore	9	6937.79
21	Limeshell	24	2779.88
22	Limestone	1990	166331.80
23	Magnesite	39	2324.87
24	Manganese ore	268	12474.84
25	Marl	1	4.23
26	Moulding sand	4	24.75
27	Perlite	1	144.88

SI. No.	Mineral	No. of Leases	Lease area (Hect.)
28	Phosphorite	10	2057.52
29	Rock phosphate	1	13.20
30	Rock salt	1	8.12
31	Ruby	1	27.66
32	Sapphire	1	673.40
33	Semi-precious stones	17	276.85
34	Siliceous earth	46	324.03
35	Sillimanite	1	4.64
36	Stibnite	1	40.47
37	Tin	13	291.23
38	Vermiculite	59	1004.89
39	White clay	7	57.31
40	White shale	42	367.12
41	Wollastonite	16	327.58
	Total	3527	315986.03

Sources: Respective State Governments (DGMs/DMGs etc); However, the data received from respective regional offices of IBM have also been taken in account wherever necessary.

(P): Provisional

Detailed time lines and outcomes of ongoing and completed projects of JNARDDC, Nagpur

Completed projects:

S. No.	Project Title	Outcomes
1.	To study the fire retardancy of nano-ATH in polymers with CIPET, Bhubaneshwar S&T(Mines) (Oct 2018 : 2″ yrs)	Aluminium hydroxide is a common inorganic additive used in a wide range of industrial applications. One of its applications is its use as a fire retardant. Polymer based materials are now recognized as key components in many important industries such as construction, automotive, electronic and aerospace due to their outstanding physical and electronic properties, cost- effectiveness, high versatility, and portability. However, one severe problem with many polymers is that they are highly flammable and can produce large amounts of toxic smoke during combustion, which poses a great threat to human safety. In order to tackle this problem the project was undertaken to explore the use of Nano- ATH as flame retardant fillers into polymer matrices because of its specific properties of high surface area and good dispersibility. A new process and product using nano size aluminium tri-hydrate in polymer matrix for fire retardant filler application has been successfully developed at lab scale which can be suitably used for acoustic panels in building and constructions industry.
2.	Optimization of digestion efficiency in Bayer process by ascertaining the ideal size fraction of bauxite feed. S&T (Mines) (Dec-2019 : 1 yr)	The alumina refineries are presently operating upon the feed size of the bauxite to ball mill after conducting a series of experiments before setting up of plant. But over the years, bauxite characteristics as well as if there is a change in bauxite origin the constituents may vary. Accordingly, the project findings reveal that if we reject the finer size fraction there will be reduction in consumption of both specific bauxite and caustic soda consumption leading to improvement in digestion efficiency. The optimum particle size of the feed bauxite to digestion has been recommended in the report.

S. No.	Project Title	Outcomes
	Development of a process technology (at lab scale) for low- cost production of 3N (99.9%) pure alumina (Ministry of Science and Technology –DST &Anna University) (March 2019 : 2 yrs)	The Centre has successfully developed the lab scale process know how for the low-cost production of 3N pure alumina at much low temperature suitable for LED (Light Emitting Diode) and Semiconductor applications. The cost economics for 3N pure alumina synthesis process has also been evolved. Presently, India does not have a production base of LED due to import of 3Nand 4N alumina. In view of the market, product potential and availability of raw materials in India the process has a commercial potential to add to the vision of Make in India program on being suitably scaled up.

Ongoing projects :

S.	Project Title with timeline	Outcomes / Remarks	Completion
No.			target
1.	Development of ceramic proppant from low grade materials (Partially Lateralised Khondalite -PLK, Fly ash, etc.) - Phase-II-Scale up studies :(NALCO, Bhubaneswar) (Feb 2018 :3 yrs)	Based on the successful lab scale process already developed by JNARDDC the scale- up project for developing ceramic proppant from low grade materials (Partially Lateralised Khondalite -PLK, Fly ash, etc.) under Phase-II has been undertaken. The process is an effort for converting unutilised materials into value added products. An effort towards Make in India and Swachh Bharat.	Mar-2021
2.	Bench scale study on extraction of pure Silica and smelter grade Aluminium Fluoride from Coal Fly Ash (CFA) (March 2019 : 2 yrs)	Project aims to develop bench scale process for the extraction of pure silica and aluminium fluoride from abundantly available Coal Fly Ash (CFA)- solid waste being generated in thermal power plants around the country which typically contains 27-31% alumina (Al2O3), 56-60% silica (SiO2) and 9-13% oxides of elements (Ca, Mg, Na, Fe, Ti etc.). CFA will be treated with mineral acid for extracting pure silica (which is used in structural materials, microelectronics, food & pharmaceutical)	

S.	Project Title with timeline	Outcomes / Remarks	Completion
No.			target
		and aluminium fluoride (which is heavily	Mar-2021
		consumed by primary aluminium industries	
		-15 to 20 kg/t Al). Results from preliminary	
		inhouse studies prompted JNARDDC to	
		take up this challenging R & D program,	
		which has potential to address not only	
		national but internationally burning issue	
		and whose success will be big boost in	
		improving global environment.	
3.	Techno-economic Survey of	Current recycling rate in India is only 25%	Mar-2021
	Aluminium Scrap Recycling in India	compared to the world average of 45%.	
	with MRAI (S&T Mines) (Oct 2018)	The country has a long way to go before	
	(2.5 yrs)	it can become a major aluminium recycler	
		and feed the secondary metal market	
		which is dependent on imports.	
		Presently key concern areas of aluminium	
		recycling in the country are complete lack	
		of structure for aluminium scrap handling	
		and secondary metal recovery.	
		On this background this project will help	
		Ministry of Mines in establishing the	
		techno-economic status of the aluminium	
		recycling industry in the country and in	
		due course help in formulation of policies	
		formulated the draft scrap recycling policy	
		for aluminium which has been put up for	
		comments of the public	
Δ	Eabrication of Advanced Ceramic	The project deliverables include	lun-2021
	Nano-coatings for Automotive	development of a technology to prepare	
	Applications with Christ University.	nano sized plasma spray powder from	
	(S&T Mines) (Dec 2018 : 2 ″ yrs)	nano ceramic (commercial) compositions	
		involving alumina and zirconia (in line with	
		Make in India Concept). The outcome	
		of the project could lead to overall life	
		enhancement of automobile components.	

S.	Project Title with timeline	Outcomes / Remarks	Completion
No.			target
5.	An innovative and viable process for recovery of iron values from red mud and processing of non-iron material for developing value added products – Complete Utilisation of red mud". NALCO (Jointly with IIMT Bhubaneswar & Eesavyasa Tech. Pvt. Ltd. Telangana) (Sept 2019 : 2yrs)	Project aims to develop an innovative and viable process for recovery of iron values from red mud and processing of non-iron part for its application as an insulating product with an aim for complete utilization of red mud. JNARDDC will be the nodal agency and the deliverables shall include mass and energy balance of the developed process.	Sep-2021
6.	Utilization of aluminium dross to achieve zero waste – A bench scale study S&T (Mines) (Dec-2019 : 2 yrs)	The main objective of the project is to develop the bench scale process for preparation of Poly Aluminium Chloride (PAC) from waste aluminium dross and to prepare castable refractory from residual dross for industrial applications to achieve zero waste. The potential benefit in preparing PAC from aluminium dross is providing alternative source to primary material and reduction in waste disposed to landfills.	Jun-2021
7.	Production and certification of certified reference materials (CRMs) for the analysis of aluminium alloy S&T (Mines) (Dec-2019 : 2 ["] yrs)	The main objective of the project is to produce certified reference materials (CRMs) for aluminium alloys at JNARDDC for the benefit of the aluminium industry and to provide import substitute. Being accredited with ISO 17025 by NABL for its analytical facilities, JNARDDC is well- placed to produce CRMs. In this regard, accreditation in accordance with ISO 17034 is under progress. This will be an import substitute to high quality CRMs for aluminium sector.	May-2022

Annexure 11.1

During FS 2020-21, total twelve items of Geological Mapping on 1:25,000 scale including one Integrated Thematic Mapping (ITM) and two RP items have been taken up in NER of which two items taken in Arunachal Pradesh, three items in Meghalaya, four items in Assam, one item in Sikkim, two items in Manipur & Nagaland. During the period from 1st April, 2020 to 31st December, 2020, an area of 715 sq. km and 58 Line km in RP items have been covered.

Sr. No.	ltem Type	Title of the Item	State	Achievement between 1st January'2020 and 31st March 2020
1	ITM	Integrated Thematic Mapping to establish the tectonic evolution of the Jashora Com- plex and its relationship with granitoids and to demarcate the different litho components in and around the Jashora complex between Amsoi-Amtreng- Rajagaon areas of Karbi Anglong and Nagaon districts of Assam.	ASSAM	55 sq. km
2	STM	Specialised Thematic Mapping in parts Pap- um Pare District to elucidate the lithostratig- raphy, biostratigraphy and structure of Siwa- lik Supergroup of rocks.	ARUNACHAL PRADESH	87 sq. km
3	STM	Specialized Thematic Mapping around Mawlyynong-Nongjiri -Dawki-Sonapur ar- eas, East Khasi, East Jaintia and West Jaintia Hills District, Meghalaya to decipher the na- ture of Dawki and associated fault systems, their dynamics, stress systems and relation with the upliftment of Meghalaya Plateau.	MEGHALAYA	125 sq. km
4	STM	Specialized Thematic Mapping in and around Baitha Langso and Donka Mokam, Karbi An- glong district, Assam to elucidate the evolu- tion of Shillong basin, metamorphic history of basement Gneissiccomplex and Shillong Group of rocks	ASSAM	130 sq. km

FS: 2019-20

Sr. No.	ltem Type	Title of the Item	State	Achievement between 1st January'2020 and 31st March 2020
5	RP	Characterization of Proterozoic Shillong Group of rocks in Meghalaya- its tectonics and depositional environment.	MEGHALAYA	46 L.km
6	RP	Tectono-metamorphic Evolution of the Base- ment Gneissic Complex of Khasi and Garo hills, Meghalaya.	MEGHALAYA	40 L.km

FS: 2020-21

Sr. No	ltem Type	Title of the Item	State	Achievement between 1 st April, 2020 and 31 st De- cember, 2020
1	RP	Characterization of Proterozoic Shillong Group of rocks in Meghalaya its tectonics and depositional environment.	Meghalaya	58 L. km
2	RP	Specialized Thematic Mapping of Assam Meghalaya Gneissic Complex (AMGC) in parts of Rongram-Agalgre-Jengjal, West Garo Hills district, Meghalaya to unravel the tectono-metamorphic evolution of the western part of AMGC.	Meghalaya	85 sq. km
3	STM	Specialized Thematic Mapping to establish the nature of eastern boundary of Shillong Basin and to classify the granite gneisses and granitoids of Assam Meghalaya Gneissic Complex (AMGC) in and around Nongbah, Namdong, Nartiang & Mynso areas, West Jaintia & East Khasi Hills Districts.	Meghalaya	36 sq. km

Sr. No	ltem Type	Title of the Item	State	Achievement between 1 st April, 2020 and 31 st De- cember, 2020
4	STM	Integrated Thematic Mapping to establish the tectonic evolution of the Jashora Complex and its relationship with granitoids and to demarcate the different litho components in and around the Jashora complex between Amsoi-Amtreng-Rajagaon areas of Karbi Anglong and Nagaon districts of Assam.	Assam	100 sq. km
5	STM	Specialised Thematic Mapping in and around Silimkhowa, Bura Langpho & Naga Langso areas of Karbi Anglong District, Assam to decipher the contact relationship between Assam Meghalaya Gneissic Complex and Shillong Group of rocks with special emphasis on their tectono-metamorphic history	Assam	50 sq. km
6	STM	Specialized Thematic Mapping around Langhin and Karkok areas in Karbi Anglong (East) District, Assam to establish the tectonic setup of Assam Meghalaya Gneissic Complex (AMGC)	Assam	37 sq. km
7	STM	Specialized Thematic Mapping in and around Baitha Langso and Donka Mokam, Karbi Anglong district, Assam to elucidate the evolution of Shillong basin, metamorphic history of basement Gneissic complex and Shillong Group of rocks	Assam	80 sq. km
8	STM	Specialized Thematic Mapping in and around Purr-Pungro-Chipur areas of Kiphire and Tuensang Districts, Nagaland to characterize ophiolite suite of rocks and delineate the associated mineralization	Nagaland	60 sq. km

Sr. No	ltem Type	Title of the Item	State	Achievement between 1 st April, 2020 and 31 st De- cember, 2020
9	STM	Specialized Thematic Mapping in and around Tengnoupal area to study Ophiolite suite along with associated mineralization, Oceanic Pelagic and associated sediments, Tengnoupal and Chandel District, Manipur	Manipur	87 sq. km
10	STM	Specialised Thematic Mapping in Guntung-Lumdung-Seppa-Pachi area for establishment of litho-tectonic interrelationship among various litho units and economic potentiality in East Kameng and parts of Pakke-Kessang Districts of Arunachal Pradesh.	Arunachal Pradesh	20 sq. km
11	STM	Specialized Thematic Mapping in Bhairobkunda-Kalaktang to study lithostratigraphy and structure of Siwalik, Gondwana and Bomdila Group of rocks in parts of West Kameng District, Arunachal Pradesh	Arunachal Pradesh	80 sq. km
12	STM	Specialized Thematic Mapping (1:25,000) along Gangtok - Changu - Kupuk - Zuluk - Rongli in parts of East Districts, Sikkim	Sikkim	80 sq. km

Annexure 11.2

Total three items of Geochemical Mapping on 1:50,000 Scale with collection of samples in grid pattern have been taken up during the FS 2020-21 in parts of Meghalaya, Tripura, Arunachal Pradesh and Manipur and an area of 1982 sq. km has been covered during the period from 1st April, 2020 to 31st December, 2020.

Sr. No.	ltem Type	Title of the Item	State	Achievement be- tween 1 st January' 2020 and 31 st March 2020
1	GCM	Geochemical mapping in Toposheet No.83L/5 in parts of Ukhrul and Kamjong districts of Manipur.	Manipur	480 sq. km
2	GCM	Geochemical mapping in Toposheet No. 83L/02 in parts of Thoubal, Imphal East and Tengnoupal districts of Manipur.	Manipur	480 sq. km
3	GCM	Geochemical mapping in Toposheet No. 83B/5 in parts of Darrang, Sonitpur dis- tricts of Assam and West Kameng district of Arunachal Pradesh.	A r u n a c h a l Pradesh	303 sq. km

F.S. 2019-20

FS: 2020-21

Sr. No.	ltem Type	Title of the Item	State	Achievement between 1 st April, 2020 and 31 st December, 2020
1	GCM	Geochemical Mapping in Toposheet No. 78K13 in Golpara District of Assam and Garo Hills District, Meghalaya.	Assam	244 sq. km
2	GCM	Geochemical Mapping in Toposheet No. 78K14 in East Garo Hills & West Khasi Hills District, Meghalaya.	Meghalaya	316 sq. km
3	GCM	Geochemical mapping in Toposheet No. 78K5 covering parts of North Garo Hills Districts of Meghalaya and Goalpara District of Assam.	Assam	256 sq. km

Sr. No.	ltem Type	Title of the Item	State	Achievement between 1 st April, 2020 and 31 st December, 2020
4	GCM	Geochemical Mapping in Toposheet No. 78K15 in East Garo Hill and West Khasi Hills Districts, Meghalaya.	Meghalaya	120 sq. km
5	GCM	Geochemical mapping in Toposheet No. 78K/1 covering parts of Goalpara & Dhubri Districts of Assam and West Garo Hills District of Meghalaya	Meghalaya	208 sq. km
6	GCM	Geochemical mapping in Toposheet no. 78K/9 covering parts of Goalpara District of Assam and East Garo Hills district of Meghalaya.	Meghalaya	220 sq. km
7	GCM	Geochemical mapping in parts of Toposheet Nos. 83L/9 & 10 in Kamjong District of Manipur	Manipur	112 sq. km
8	GCM	Geochemical mapping in Toposheet No. 79M/13 covering parts of Khowai, Dhalai and Unakoti districts of Tripura.	Tripura	70 sq km
9	GCM	Geochemical mapping in Toposheet No. 82L/12 covering parts of West Siang district of Arunachal Pradesh.	Arunachal Pradesh	116 sq km
10	GCM	Geochemical mapping in Toposheet Nos. 83B/2 and 83B/6 covering parts of Darrang, Sonitpur, Morigaon and Nagaon Districts of Assam	Assam	320 sq km

Annexure 11.3

Total two items of Geophysical Mapping on 1:50,000 Scale have been taken up during the FS 2020-21 in parts of Meghalaya and Assam and an area of 400 sq. km has been covered during the period from 1st April, 2020 to 31st December, 2020.

Sr. No.	ltem Type	Title of the Item	State	Achievement between 1stJanuary' 2020 and 31stMarch 2020
1	GPM	Geophysical mapping by magnetic survey (Total Field) in Toposheet Nos. 78O/10 & 13 and 83B/8 & 11, covering parts of Ri Bhoi, East Khasi Hills and West Khasi Hills districts of Meghalaya, and Nagaon, Morigaon and Karbi Anglong districts of Assam	M e g h a l a y a and Assam	1440 sq. km
2	GPM	Geophysical mapping in Toposheet Nos. 83F/3 and 83F/7, covering parts of Karbi Anglong and Nagaon districts of Assam	Assam	870 sq. km

F.S. 2019-20

FS: 2020-21

Sr. No.	ltem Type	Title of the Item	State	Achievement between 1stApril, 2020 and 31stDecember, 2020
1	GPM	Geophysical Mapping in Toposheet Nos. 78K/15 and 78O/3 covering parts of South Garo Hills, West Khasi Hills and South West Khasi Hills districts of Meghalaya.	Meghalaya	50 sq. km
2	GPM	Geophysical mapping in Toposheet Nos. 78K/13 and K/14, covering parts of East, South & North Garo Hills & West Khasi Hills districts of Meghalaya and Goalpara, district of Assam	Meghalaya and Assam	350 sq. km

Annexure 11.4

One item of PGRS was taken up on 1:50,000 Scale during the FS 2020-21 in parts of Meghalaya and an area of 1400 sq. km has been covered during the period from 1st April, 2020 to 31st December, 2020.

F.S. 2020-21

Sr. No.	ltem Type	Title of the Item	State	Achievement between 1 st April, 2020 and 31 st December, 2020
1	PGRS	Delineation of high-altitude Bauxites developed over AMGC in Toposheets No. 78K/6 and 78O/10 East and West Garo Hills and West Khasi Hills District Meghalaya using ASTER and Landsat 8 OLI data	Meghalaya	1400 sq. km

Annexure 11.5

Total 1398.25 m drilling has been done during the period from 1st April, 2020 to 31st December, 2020

FS: 2019-20

SI. No.	Title	UNFC Stage	Commodity
1	Preliminary exploration for gold, vanadium and associated minerals in Phop area, Lower Subansiri district, Arunachal Pradesh	G3	Gold
2	Preliminary Exploration for Cu-Au-Ag and associated minerals in Dedollo Block, Papum Pare District, Arunachal Pradesh	G3	Basemetal
3	Reconnaissance Survey for copper, cobalt and associated minerals in Balapu - Niyamlo area, Papum Pare district, Arunachal Pradesh	G4	Basemetal
4	Reconnaissance Survey for copper, molybdenum and associated minerals in Angolin-Etalin area, Dibang Valley district, Arunachal Pradesh	G4	Basemetal
5	Reconnaissance Survey for copper, gold, silver and associated minerals in Khyate-Parang area, Papum Pare district, Arunachal Pradesh.	G4	Basemetal
6	Reconnaissance Survey for basemetal, graphite and associated minerals in Isholin-Anelih-Endolin area, Dibang Valley District, Arunachal Pradesh	G4	Basemetal
7	Preliminary Exploration for Vanadium and associated minerals around Saiya area, Lower Subansiri District, Arunachal Pradesh	G3	Vanadium
8	Reconnaissance Survey for vanadium, graphite, gold and associated minerals in Pyunli-Yachambra-Kano area, Lower Dibang Valley District, Arunachal Pradesh	G4	Vanadium
9	Preliminary Exploration for REE and associated precious and basemetal in Lodoso East Block, Papum Pare District, Arunachal Pradesh.	G3	REE
10	Reconnaissance survey for tungsten mineralization in Amgurigaon -Nellie - Ghagra area, Karbi Anglong and Morigaon Districts, Assam.	G4	Tungsten
SI. No.	Title	UNFC Stage	Commodity
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11	Reconnaissance survey for REE & Nb mineralisation in Jashora Alkaline Complex Karbi Anglong district, Assam.	G4	REE
12	Reconnaissance survey for REE, V and associated minerals in phosphate bearing shales of Kopili Formation in Boro Hundong area, Dima Hasao district, Assam.	G4	REE
13	Preliminary exploration for limestone in North Boro Hundong Block, Dima Hasao district, Assam.	G3	Limestone
14	Preliminary exploration for limestone in South Boro Hundong Block, Dima Hasao district, Assam.	G3	Limestone
15	Preliminary exploration for Iron in the Banded Iron Formation in Nongdom-Langtor area, West Khasi Hills District, Meghalaya		Iron
16	Preliminary exploration for PGE, Ni, REE and associated minerals in Northeast of Mawpyut, West Jaintia Hills district, Meghalaya.		PGE
17	Reconnaissance survey for PGE, Ni, Cr around Mawpyut area, East Khasi and West Jaintia Hills district, Meghalaya		PGE
18	Reconnaissance survey for REE and associated mineralization in and around Burnihat area Ri-Bhoi district, Meghalaya and Kamrup (Metro) district Assam		REE
19	Reconnaissance survey for REE and other associated minerals within Regolith cover over the Gneisses and Granitoids of Assam Meghalaya Gneissic Complex (AMGC) and younger Granitoids in parts of East Khasi Hills, West Khasi Hills& Ri bhoi districts, Meghalaya. (2-year item)		REE
20	Reconnaissance survey for Lithium and associated REE & RM mineralisation in Umlyngpung Block, East Khasi Hills district, Meghalaya	G4	Lithium
21	Reconnaissance survey for Tungsten mineralisation in Manai-Mairang Block, West Khasi Hills district, Meghalaya (2-year item)	G4	Tungsten
22	General exploration for limestone in Khaidong-Shnongrim block, Litang Valley, East Jaintia Hills district, Meghalaya	G2	Limestone
23	General exploration for limestone in South-West of Mynthlu Block, Litang Valley, East Jaintia Hills district, Meghalaya	G2	Limestone

SI. No.	Title		Commodity
24	General exploration for limestone in Lamarsiang block, Litang Valley, East Jaintia Hills district, Meghalaya (G2)	G2	Limestone
25	General exploration for aluminous laterite/lateritic bauxite and REE, North east of Rambrai block, West Khasi Hills District, Meghalaya.	G2	Bauxite
26	Reconnaissance survey for aluminous laterite/lateritic bauxite and REE in Wahrinong area, West Khasi Hills District, Meghalaya.	G4	Bauxite
27	Regional Mineral targeting over the Pan-African Granitic plutons of Shillong Plateau (2-year item)	RMT	
28	Reconnaissance survey for chromium, nickel and basemetal mineralization in Gamnom-Yentem area in part of Manipur ophiolite belt, Ukhrul District, Manipur.	G4	Chromium
29	Reconnaissance Survey for Ni-Cr-PGE and associated basemetal around Khudengthabi-Yangoupokpi area in part of Manipur Ophiolite belt, Tengnougpal District, Manipur.	G4	Nickel
30	Reconnaissance Survey for Cu, Ni, PGE and associated minerals around Kwatha-Namjet Lok area, Manipur Ophiolite belt, Tengnougpal District, Manipur.	G4	Basemetal
31	Reconniatory survey for basemetal and associated mineralisation around Mangkha - Mangalbare area in East and South District, Sikkim (G-4)	G4	Basemetal
32	Reconnaissance for coal around Baghty, Sanis, Chudi and Lotsu area of Wokha District, Nagaland.	G4	Coal

FS: 2020-21

SI. No.	Title	UNFC Stage	Commodity
1	Reconnaissance survey for Graphite and Vanadium mineralisation in Kalamati area, West Siang District, Arunachal Pradesh. (G4)	G4	Graphite
2	Preliminary Exploration for Graphite and Vanadium mineralisation in Radhpu block, Lower Subansiri District, Arunachal Pradesh. (G3)	G3	Graphite

SI. No.	Title		Commodity	
3	Reconnaissance survey for graphite and vanadium mineralisation in Kalaktang-Amatulla area, West Kameng District, Arunachal Pradesh. (G4)		Graphite	
4	Reconnaissance survey for orogenic Gold mineralisation in upper reaches of Siyom valley, West Siang District, Arunachal Pradesh. (G4)		Gold	
5	Reconnaissance survey for orogenic Gold mineralisation in Siyom valley, West Siang district, Arunachal Pradesh. (G4)		Gold	
6	Preliminary exploration for molybdenum and associated mineralization in the area between Helagog-Khaloibari, Kamrup Metropolitan District, Assam. (G3)	G3	Molybdenum	
7	Reconnaissance survey for placer gold in Subansiri basin, North Lakhimpur district, Assam. (G4)	G4	Gold	
8	Reconnaissance survey for REE mineralisation in Panbari– Geleki area, Karbi Anglong District, Assam. (G4)	G4	REE	
9	Reconnaissance survey for Tungsten mineralisation in Tura area, West Garo Hills District, Meghalaya. (G4)		Tungsten	
10	Reconnaissance survey for REE and other associated minerals in parts of East Khasi Hills, West Khasi Hills & Ri- bhoi districts, Meghalaya.	G4	REE	
11	Reconnaissance survey for Tungsten mineralisation in Manai- Mairang Block, West Khasi Hills district, Meghalaya. (G4)	G4	Tungsten	
12	Reconnaissance survey for Tungsten and associated mineralisation in Nengkera block, East Garo Hills District, Meghalaya. (G4)	G4	Tungsten	
13	Regional Mineral targeting over the Pan-African Granitic plutons of Shillong Plateau. (RMT)	RMT		
14	Reconnaissance survey for Ni, Cu, and PGE in Moreh to Minau areas, Manipur Ophiolite belt, Tengnoupal and Chandel districts, Manipur. (G4)	G4	Nickel	

SI. No.	Title	UNFC Stage	Commodity
15	Reconnaissance survey for nickeliferrous laterite, chromium, PGE and associated basemetals around Mollen-Washelo in ultramaficmafic rocks in part of Ophiolite Belt, Phek District, Nagaland (G4)	G4	Nickel
16	Reconnaissance survey for graphite and basemetal mineralisation around Chitre-Dhareli-Kalijhar areas, West District, Sikkim. (G4)	G4	Graphite
17	Preliminary Exploration for Vanadium and associated minerals around Saiya area, Lower Subansiri District, Arunachal Pradesh	G3	Vanadium
18	Preliminary exploration for gold, vanadium and associated minerals in Phop area, Lower Subansiri district, Arunachal Pradesh	G3	Gold
19	Preliminary Exploration for REE and associated precious and basemetal in Lodoso East Block, Papum Pare District, Arunachal Pradesh.	G3	REE
20	Reconnaissance survey for shale gas around Chedema- Dihoma area, Kohima District, Nagaland	G4	Shale Gas

Annexure 14.1

List of Nodal Officers, CPIOs and Appellate Authorities in Ministry of Mines

Nodal Officer (RTI)	CPIO (RTI)	ACPIO (RTI)
Shri A. R. Sengupta,	Shri T. G. Venkatesh,	Shri Ashok Kumar,
Deputy Secretary	Under Secretary	Section Officer
Room No.: 309-D Wing, III Floor,	Room No.: 111 A (Cabin), F	Room No.: 301-D Wing, III
Shastri Bhawan, New Delhi - 11	Wing, I Floor, Shastri Bhawan,	Floor, Shastri Bhawan, New
0001	New Delhi – 110001	Delhi – 110 001
Tel No. :23381172	Tel No.:	Tel No.: 23382715
E-mail : ar.sengupta@nic.in	E-mail: tg.venkatesh@nic.in	Email: ashok.kmr62@gov.in

SI. No.	СРЮ	Subject matter dealt (Section)	Appellate Authority
1.	Sh. Yogesh R. Patel,	Establishment	Sh. H. K. Mallick,
	Under Secretary Room No.: 303-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23383946 E-mail : yogesh.patel77@ gov.in	Administration (including Cash, Library & Records), R & I	Deputy Secretary Room No.: 307-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001
		Revision Cell	E-mail : hk.mallick@nic.in
		ACC/ Board level postings for PSU/ Attached Offices/ Subordinates Offices/ Autonomous Bodies	Shri Amit Saran, Director Room No.: 310-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23381136 E-mail : amit.saran@nic.in
2.	2. Smt. Lakshmi Subramanian, Under Secretary Room No.: 303-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23387223 E-mail : lakshmi.s@nic.in	Vigilance	Shri Amit Saran, Director Room No.: 310-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23381136 E-mail : amit.saran@nic.in
		Metal-II (Other Metals related matters), (BGML, HZL etc.)	Sh. Sanjeev Verma, Director Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi –
		Metal-III (Copper & related matters), (HCL, etc.)	110001 Tel No. : 23070260 E-mail : sanjeev.verma79@gov.in

Annexures

SI. No.	СРЮ	Subject matter dealt (Section)	Appellate Authority
3.	Shri Adhir Kumar Mallik, Under Secretary Room No.: 314-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23384743 E-mail : ak.mallik@nic.in	Metal-I (Aluminium & Bauxite matters), (NALCO, KABIL etc.)	Sh. Sanjeev Verma, Director Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23070260 E-mail : sanjeev.verma79@gov.in
		Mines IV Section: (Auctions) Sand Mining & Auctions Monitoring (Including 2020 MLs), DMF, PMKKY	Shri Mustaq Ahmad, Director Room No.: 313-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001
		Mines IV Section: (RAKIA) Matter related to RAKIA Arbitration	Tel No. : 23383576 E-mail : mustaqahmad.dad@gov.in
		Mines V Section: Policy, DGFT matters, Illegal Mining (all cases except Beach Sand Minerals), Royalty Study Group	
		Mines VI Section: All legislative and legal matters except offshore matter.	
		Mines VI Section: Offshore Mining, OAMDR related work and Illegal mining of Beach Sand Minerals	Shri Mustaq Ahmad, Director Room No.: 313-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001
		Mines VI Section: monitoring & coordination of - LIMBS (All Legal cases)	Tel No. : 23383576 E-mail : mustaqahmad.dad@gov.in
		National Conclave of Mines and Minerals, Conferences/ Workshops/ Meetings	Smt. Farida M. Naik, Director Room No.: 312-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23384593 E-mail : fm.naik@nic.in

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SI. No.	СРЮ	Subject matter dealt (Section)	Appellate Authority
6.	Shri Vikas Raj, Under Secretary Room No.: 303-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel. No: 23070375 E-mail : Vikas.raj@nic.in	Mines I: (Exploration Matters) (MECL, GSI), All Technical matters including exploration and Survey, National Geo-science Award, Budget, FSP etc.	Shri Pradeep Singh, Director Room No.: 306-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23384741 E-mail : pradeep.singh.gsi@gov.in
		Metal- IV (S & T) (Science and Technology projects & institutions) including NIRM, NIMH & JNARDDC	Sh. Sanjeev Verma, Director Room No.: 315-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23070260 E-mail : sanjeev.verma79@gov.in
7.	Shri Rajendra Prasad, Deputy Director Room No.: 114-F Wing, I Floor, Shastri Bhawan, New Delhi – 110 001 Tel No.: 23384741 E-mail: rajendraprasad.gsi@ gov.in	NMET Cell	Shri Amit Saran, Director Room No.: 310-D Wing, III Floor, Shastri Bhawan, New Delhi – 110 001 Tel No.: 23381136 E-mail: amit.saran@nic.in
8.	Shri Ashok Kumar Prasad, Assistant Director Room No.: 305-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23383085 E-mail : ashokk.prasad@ nic.in	Official Language Section (Hindi)	Shri Birendra Singh Rawat, Deputy Director Room No.: 303-D Wing, III Floor, Shastri Bhawan, New Delhi - 110001 Tel No. : 23383085 E-mail : bs.rawat62@nic.in

SI. No.	СРЮ	Subject matter dealt (Section)	Appellate Authority
9.	Ms. Saloni, Assistant Director Room No.: 304-D Wing, III Floor, Shastri Bhawan, New Delhi – 110001 Tel No.: 23387919 Email:saloni@gov.in	Economic, Statistical and Planning Section: Vision document, Mineral/ Metal wise vision plan, various planning documents, Mining sector growth analysis and Economic scenario building, Trade issues (FTAs) & Economic inputs on all matters concerned, GST matters, Production, import, export data and its analysis, Public Procurement (Preference to Make in India, Skill Development) Statistical Publications of the ministry related to metal and mineral and statistical inputs for policy formulation.	Shri S. Arputha Swamy, Director Room No.: 311-D Wing, III Floor, Shastri Bhawan, New Delhi - 110 001 Tel No.: 23073046 E-mail: arputhaswamy.s@gov.in

Annexure 14.2

During the year 2020 (01.01.2020 to 31.12.2020), the following days were observed in the Ministry of Mines:

- i) International Women's Day was observed on 08.03.2020.
- ii) Anti-terrorism Day was observed on 21.5.2020.
- iii) International Day of Yoga was observed on 21.06.2020.
- iv) Hindi Diwas was observed on 14.09.2020.
- v) Two-year long commemoration period of 150th Birth Anniversary of Mahatma Gandhi was observed in the Ministry which concluded on 02.10.2020.
- vi) Rashtriya Ekta Diwas-2020 was observed on the occasion of birth anniversary of Sardar Vallabhbhai Patel by taking a pledge on 29.10.2020.
- vii) Vigilance Awareness Week was observed during the period 27.10.2020 to 02.11.2020.
- viii) Communal Harmony Week was observed from 19.11.2020 to 25.11.2020. The last of the week was observed i.e. 25.11.2020 as Flag Day and on Flag Day, Funds were collected by the officials of this Ministry on this occasion to send the same to National Foundation of Communal Harmony.
- ix) Constitution Day-2020 was observed in Ministry of Mines on 26.11.2020 while taking the pledge on said day. The one-year period of 26.11.2019 to 26.12.2020 has been observed by this Ministry as well the organizations under its administrative control which involved year-long activities relating to the Constitution of India as per direction of Cabinet Secretariat.
- x) Armed Forces Flag Day was observed from 01.12.2020 to 07.12.2020 and Funds were collected by the officials of this Ministry on this occasion to send the same to Kendriya Sainik Board (Ministry of Defence).

All the mentioned days falling in the COVID-19 period has been observed while following the extant guidelines/protocols applicable on the said dates.





Government of India

