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Research Paper

The History of India's Mining Industries and Their Impact During The Lockdown

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Abstract
India's infrastructure development would require crucial minerals, and mining is one of the important industries to supply them. An important sector and engine of the Indian economy's growth is mining. Basic raw materials for numerous significant industries, including thermal power generation, iron and steel, cement, petrochemicals, fertilizers, precious and semi-precious metals and stones for jewelry, electrical and electronics equipment, glass, ceramics, etc., are found in minerals and ore. India's mining industry was expected to grow significantly in the 2020–2021 fiscal year due to increased demand from end-user sectors and new investments made by mining businesses. But the spread of COVID-19 at the start of the fiscal year has caused problems in a number of industries. There is a great deal of room for expanding mining capacity in iron ore, bauxite, coal, and other minerals. There are also a lot of chances for subsurface deposit discoveries in the future. Infrastructure projects continue to offer producers of steel, zinc, and aluminum profitable economic prospects. One essential element of the real estate sector is iron and steel. Strong growth expectations are expected in the residential and commercial building industries because of the continued demand for these metals. India's mining industry is anticipated to grow positively in 2021 over 2020. It's crucial for the government's mining policymakers to keep changing these laws, as they can increase the sector's GDP contribution, as many branches collaborate with stakeholders to put the economy back on a growth trajectory. This article examines the influence of lockdown on the mining industry in India, specifically focusing on the production scenario of minerals, employment, export-import scenarios of minerals and ore, and other events that occurred throughout the period.

Keywords: *History of mining industries, Ancient times, Development during the shutdown period, Impact, Taking the initiative.*

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I. Introduction

In this paper, we can see the long-term and short-term effects of COVID-19.

It is simpler to defend assistance during the exploitation stage because a lack of extraction could result in a shortage of raw materials needed to produce essential goods like power. Mining businesses in Poland received incentives when they had to shorten their working hours because a virus had infected the crew. This was very beneficial to hard coal mines. The most obvious issues were those related to staffing in mines and a few minor issues with product sales.

The suspension or limitation of exploitation or production stemming primarily from the problem of employee absenteeism induced by quarantine or pandemic limitations is one of the short-term repercussions of the COVID-19 crisis. On the other hand, it was evident for projects situated in other European nations that the production halt was necessary for epidemiological reasons. One more of COVID-19's immediate impacts is reducing the life expectancy of mining projects that are in the closing stage. The sector is usually unaffected by the earlier-than-expected mine closure, nevertheless, because the owners were ready for this kind of situation in the event of a significant decline in the markets. The state of the industry as a whole is unaffected by the potential one- to two-year extension or shortening of the life of projects in the declining phase. The detrimental effects of the closed mine on the ecosystem persist longer than anticipated when reclamation is slowed down. The ecology and nearby communities bear the expenses.

Admittedly, this is a preliminary estimate of the damage that COVID-19 will do to the mining industry. Gathering the information so quickly was challenging since many businesses haven't yet compiled their earnings

and losses for this time frame and are unsure of any potential further pandemic effects that may arise in the future (Resources 2021, Several businesses abruptly closed without providing an explanation because they were taken aback by the COVID-19 outbreak. Nevertheless, the authors made the decision to publish their findings based on unfinished and preliminary data. This is the time to secure the supply of mineral resources, alert mining corporations, and practice resource management. The findings suggest that there is a genuine possibility that the COVID-19 problem will worsen and irreversibly impair the raw material supply chain.

II. Methodology

This study looks at the mining sectors during the COVID-19 pandemic from the perspectives of many agencies, including the World Bank, CCSA, and WHO. This work focuses on the consequences of persistent COVID-19. Its primary effects on human health, particularly those related to heart attacks, worsened during COVID-19, whereas the industrial sector saw a decline throughout the period of economic expansion.

History of the mining industries:

Based on historical records dating back to the Stone Age, it can be argued that minerals and metals have been essential to the development of civilization and the advancement of people.

Many indications exist that the country has known about minerals for ages, including coal, iron ore, copper, lead, zinc, and so on. These indicate that progressive growth was achieved through civilization that was hampered by the discovery and practical applications of these metals and minerals, which in turn defined the ages by their prevalence and names like bronze and iron, which became significant benchmarks in development indices of human growth."Arthashastra," a book written between 321 and 296 BC by Kautilya, also known as Chanakya, is the oldest and most reliable source of information about minerals in ancient India. A thorough description of the qualities of numerous minerals' and metals' ore is provided in this work, along with techniques for handling and large-scale production. Additionally, alloys like bronze, brass, and gold and silver alloys using base metals are manufactured. A Superintendent of Mines must possess understanding of the science pertaining to copper and other minerals, as well as skill in mineralogy, according to documents found in Kautilya's "Arthashastra," which also purports to contain regulations controlling the mining industry. The exposition clarifies the laws governing mining activities, particularly those pertaining to license-free mining and the theft of mineral products. It also discusses the need for mining laborers and the equipment required for the job. The duties of a Superintendent of Ocean Mines (Khanyadhyakshah) are extensively described in Arthashastra. It states that this person is responsible for collecting conch shells, diamonds, precious stones, pearls, corals, and salt, in addition to managing the business of regulating the trade of the aforementioned commodities. The state will be in charge of both the mining and the selling of minerals, according to Arthashastra.

During the Middle Ages, India's metallurgical industry was reasonably developed. Individual kingdoms developed regulations for mining operations between 1400 and 1800, but more strict regulatory controls were implemented during the Mughal era. Lead and zinc mining in Rajasthan is said to have started in the 1260s BC and persisted using prescribed revenue collection techniques until the 18th century. A few of the princely states in India, most notably Mysore, had their own security codes that were implemented during the Mughal era. Lead and zinc mining in Rajasthan is said to have started in the 1260s BC and persisted using prescribed revenue collection techniques until the 18th century. A few of the princely states in India, most notably Mysore, had their own security codes.

Ancient Times

Mining for obtaining minerals has been in vogue for thousands of years. The Egyptians mined gold 4,000 years ago, and historical records indicate that the Persians, Greeks, and Romans learned these techniques from the Egyptians. Mining during the Egyptian and early Roman periods was carried out by prisoners of war and criminals. In the early days of the Roman Empire, conquests of new lands produced many prisoners of war who were available for work in mining, shaft-sealing, and sinking in general. Later, when new slaves became less easy to obtain, they became more valuable. Beginning with Hadrian (138 CE), the Romans began to recognize a degree of individual ownership of mines and permitted the free exploitation of some mines and ore bodies. Towards the end of the Roman period, labor laws were passed that mandated improved working conditions for the workers in the mines, namely sleeping and bathing accommodations, food, and specific hours of work; shafts and tunnels to be adequately supported with timers to prevent collapse, etc.

In 1168 CE, silver was first discovered near the town of Freiberg in Saxony. In central Europe, the Avers, Czechs, and Saxons mined gold in Bohemia, Transylvania, and the Carpathians. This particular mining revival was led mainly by the Saxons and other German people. The period from antiquity to 1600 CE covered a huge time period with many changes in civilization (Allchin and Alchin 1982, p. 396). However, from the early mining by the Egyptians, Romans, etc. through the dark ages and times and then the medieval period, the techniques for forming and sinking shafts changed a little.

Significant developments in the mining industry during the shutdown period

The following lists significant events and actions in the Indian mining and mining sector; several of these were scheduled prior to COVID-19 as ongoing mining reform procedures.

1) According to a notification issued in the Official Gazette on March 13, 2020, the Central Government has enacted the Mineral Laws (Amendment) Act, 2020, to amend the Coal Mines (Special Provisions) Act, 2015, and the Mines Minerals (Development and Regulation) Act, 1957. In particular, the Act will encourage ease of doing business and usher in a new era in the Indian coal and mining sector. The Minerals (other than Atomic and Hydrocarbon Energy Minerals) Concession Rules, 2016 and the Mineral (Auction) Rules, 2015 were amended in accordance with the provisions of the aforementioned Act. The amended documents are General Statutory Rules (G.S.R.) 190(E) dated March 20, 2020, and General Statutory Rules (G.S.R.) 191(E) dated March 20, 2020, respectively.

2) Under Section 8A(5)(6) of the MMDR Act, 1957, the government authorized the state government to designate a secondary-level officer who serves as the administrative head of the Ministry or Department of that state as the Nodal Officer with regard to leases that are about to expire. The nodal officers will have the authority to obtain all legitimate permits, clearances, approvals, and other privileges. (Ministry of Justice Gazette Notification No. General Statutory Rules (GSR) 191(E), issued March 20, 2020, Government of India, Ministry of Mines).

3) The Ministry of Mines is drafting a national scrap recycling policy for non-ferrous metals, such as copper and aluminum. As a result, a draft of the aforementioned policy has been created and is being distributed on March 27, 2020, for feedback from interested parties and the general Public. The National Non-Ferrous Metal Scrap Recycling Framework, 2020, was just released by the government.

4) Extend for two years from the start of the new lease all valid permissions, including environmental clearances vested with the prior lessor (Gazette). Notification No. SO 1224(E), Ministry of Environment, Forward Stand Climate Change, Government of India, dated March 28, 2020.

5) On May 16, 2020, the Honorable Finance Minister announced plans to increase private sector investments in the mining industry and implement reforms there under the Atmanirbhar Bharat scheme, an economic stimulus package to cater to several sectors, including the mining sector. The Ministry of Mines is considering other recommendations as well as legal adjustments to the Mines and Mineral (Development and Regulation) Act, 1957, in order to put the announcement into practice.

6) Videorderno.16/4/2020MVIdated June 3, 2020: The Central Government, exercising the authority granted by Section 20A of the MMDR Act, 1957, directs the state government to follow the preembedded clearance guidelines annexed to this order and implement the same in letter and spirit for the benefit of the nation.

7) Permit Steel Authority of India Limited (SAIL), a public sector entity, to sell fines and tails from old stocks and to sell 25% of its output from the previous year on the open market. Recently, the government also gave Neelachal Ispat Nigam Limited (NINL) permission to sell up to 25% of its yearly iron ore production as long as the firm achieves the MDPA. This authorization is valid for a year or until the company's disinvestment is completed, whichever comes first.

8) Of the 103 mineral blocks that have been put up for auction since 2015, a total of 27 mineral blocks have been successfully auctioned off in 2020 in the states of Madhya Pradesh (limestone-2, bauxite-1, and gold-2) and Odisha (iron-13, iron ore and manganese-6, manganese-2, and chromites 1).

9) According to information obtained in a press release issued by the Press Information Bureau (PIB) on March 31, 2020, the Union Ministry of Commerce and Industry declared modifications to the Government of India's Foreign Trade Policy (FTP). The current policy is in effect for five years, ending on April 1, 2015, and is valid until March 31, 2020. Considering the extraordinary circumstances, the government has chosen to continue providing relief under various export promotion schemes in light of the current COVID-19 epidemic. This has been achieved by extending the present foreign trade policy by an additional year, or until March 31, 2021.

10) The Ministry of Mines has instructed IBM to identify non-working leases, explore potential closure concerns, and develop an early start strategy for them.

11) The Indian Bureau of Mines (IBM) has authorized every mining plan that was obtained from auctioned licenses that had expired in 2020 within a thirty-day period. IBM has additionally enabled leases during the COVID-19 term by enabling the early cancellation of mining plans.

12) The mining industry has received technological solutions for waste utilization of iron ore, bauxite, rock phos phate, manganese, and other minerals; these solutions also enable the industry to recover byproducts and add val ue to low-grade, sub-grade, and complicated ores.

13) Work is being done to expedite permissions regarding these auctioned mines in order to operationalize the m atter as soon as possible.

Following the announcement of a nationwide lockdown on March 24, 2020, the Central Government released a ministry of guidelines on the measures to be taken by Ministries and Departments of the Government of India, State and Union Territory Governments, and State and Union Territory Authorities for the containment of the

COVID-19 epidemic in the country," issued by Home Affairs Order No. 403/2020 on March 24, 2020. According to this document, industrial enterprises will stay closed, with the exception of manufacturing vital goods and some production units with prior authorization. The Ministry of Home Affairs, Government of India, released an addendum the next day to remove certain sectors and "coal and mineral production, transportation, supply of explosives, and activities incidental to mining operations." The State Government of Odisha invoked the Epidemic Diseases Act of 1897 and published the Orissa COVID-19 Regulations, 2020 under it, in continuation of the Central Government's recommendations mentioned above. The government is able to exempt "essential services" from lockdown measures because of this legislation. Subject to preventive measures like social distancing and containment, the Health and Family Welfare Department issued an order (9015/H&FW) on March 24th that excluded the following from any restrictions: "Operation of mines of iron ore, coking coal, thermal coal, limestone, dolomite, manganese, chromite, etc., as well as operations of iron ore pellet plants, etc., which are critical raw materials for the manufacturing of steel. Mining operations, especially in captive mines, proceeded during the lockdown period in accordance with the aforementioned standards. Authorization for the 25% iron ore sale to SAIL: In light of the iron ore scarcity resulting from mining lease expiration on March 31, 2020, and the nonoperation of auctioned iron ore mines, the Indian government authorized the sale of minerals at a rate of 25% of the previous year's production (or iron ore quantity) to M/sSAIL. Below are state-specific sales numbers and details: 2021's Indian mining sector With the central government's approval of pending mining reforms anticipated in January alone and efforts to support overall mineral output continuing, the country's mining sector is projected to experience "hectic activities" in the new year. It will be a "bridge year between the past and the future." There is a great deal of room for expansion in terms of iron ore, bauxite, coal, and other minerals, as well as a great deal of potential for subsurface deposit discoveries in the future. Producers of steel, zinc, and aluminum continue to benefit financially from infrastructure initiatives. Steel and iron combine to form an essential element of the real estate industry. In comparison to 2020, the Indian mining industry is predicted to increase positively in 2021. IBM also developed a plan to monitor mines using space technology and provides support for the online processing of mine plans for an early and transparent disposal mechanism. In summary, India is prepared to take the lead in an era of fast industrialization by capitalizing on the disruption produced by COVID-19. The nation's mining industry is essential to its post-COVID-19 recovery. A few initiatives in this direction include the recommended enhancement of the process for awarding mining concessions and improved agency collaboration. The government's measures are intended to influence the industry that is thought to have fresh growth prospects, with the intention of unleashing fresh capital, increasing output, and generating employment. In these difficult times, it is crucial that the mine owners and operators take action against No. Senior. State government authorization for 25% of the previous year's production (quantity) to be sold as minerals SAIL's Iron ores old by Notes

1. Odisha: 2.3975 million tons in 2019–2020; 0.155 million tons in 2020—2.635 million tons in 2021; 1.33 million tons until December 18, 2020

2 Madhya Pradesh 1.7 million tons versus 0.25 million tons in 2020–2021 The offer ends on December 31, 2020.

3.Madhya Pradesh 1.02 million tons in 2019–2020 Not granted permission by the state government to analyze the problems thoroughly, handle them skillfully, and lead the mining sector in a new direction. India's economy might reach $5 trillion by 2024 thanks to mining, which would also support the government's 2020–2021 budget and hasten the country's economic recovery from the lockdown's effects. Notwithstanding the obstacles presented by COVID-19, India must advance industrially in order to become an Atmanirbhar Bharat, or self-sufficient India.

Taking the initiative

There is some indication that mining firms are starting to take action. In Canada and Argentina, Yamana Gold has stopped producing and demobilized its employees. In Illinois, eight coal miners are on leave. Some of the declines in demand have been supported by these supply reductions, which also explain some of the price increases that occurred in late March and early April. But this presents a double problem for businesses: reduced prices and lower output. In the event that this production resumes, it also increases the possibility of an excess supply on the market.

The unique perspective of a potentially significant short-term impact from COVID-19 is highlighted by the similarities between the GFC and COVID-19, which may differ from the experiences encountered during the Great Financial Crisis (GFC). ASM gold miners are responsible for deforestation and environmental degradation in many countries, but they also play a vital role in providing livelihoods, foreign exchange, and income to regions, countries, and individuals. The higher gold price during the Great Financial Crisis (GFC) encouraged, induced, and incentivized the growth of ASM gold miners in these countries. It will be crucial for

future studies to determine how the lockdown, declining prices, and decreased demand will affect people working in this industry. Given the mounting evidence of the connections between ASM and agriculture (and consequently food security) in many nations (Bryceson and Jonsson, 2010; Maconachie, 2011; Hilson, 2016), as well as the activity's function in giving many of the world's poorest communities a safety net (Aizawa, 2016),. Globally, there will likely be short- and medium-term effects for those working in the large-scale mining industry. Additionally, the earnings of nations might be impacted. Mining is a major industry for many developing nations, and the industry's activities affect the earnings of the public and private sectors. Mongolia, Suriname, Mauritania, Eritrea, and Guyana have mineral rents that exceed 15% of GDP (World Bank, 2020). These nations must weigh the potential loss of tax revenue from stopping mining operations in an effort to stop the virus's spread against the difficult decision to do so during a period of extreme financial strain.

Future research on these countries' crisis management strategies is essential to bolstering their capacity to withstand similar outbreaks in the future.

In addition to these immediate effects, the COVID-19 epidemic is expected to have medium- and long-term effects on people, businesses, and nations involved in the mining industry. The rate and extent to which nations emerge from lockdown, as well as the way in which governments handle the crisis's financial effects, will determine the size of the global recession that the pandemic is likely to cause. On the one hand, economies may recover swiftly since there hasn't been a significant decrease in the amount of productive capacity lost, as there was in the case of the amount of money in circulation worldwide, as seen in the wake of the Great Financial Crisis and the Wall Street Crash. Conversely, lockdowns may last for months or even years at a time, having an impact on international trade and building. This would lower demand for minerals generally, which would lower supply and/or pricing. This creates the possibility of an oversupply in some markets in the medium run, possibly resulting in sunk investments in the industry that must be discontinued or run at a loss. This could result in lower profits for investors, less money invested in the sector, which would reduce efficiency, less money invested in social, cultural, and environmental projects, wage pressure, which would affect people's ability to support themselves, and less money collected in taxes for governments that frequently rely heavily on income derived from the industry. Future research should focus on how widespread these effects are and how they affect businesses, communities, and nations.

Given the sector's larger long-term criticality and the dynamic environment in which it functions, the shock from COVID-19 and its effects on the mining industry are important research topics. A significant body of research is beginning to emerge that emphasizes how vital the mining sector is in supplying the raw materials required to make the shift to a low-carbon economy (World Bank, 2017; Bazilian, 2018). The mining industry must be adaptable enough to be able to shift output to new deposits and resources in order to meet this demand.to quick changes in technology, necessitating a certain level of financial stability. It is imperative for academia, politicians, and industry to comprehend the implications of any pandemic-related deterioration of resilience, as this could have significant ramifications for addressing the task of combating climate change.

COVID-19 may intensify or lessen current tendencies in the sector, which could have long-term effects on how the sector develops. The industry's incentives to use labor may rise in response to declining wages or decline as a result of potential bureaucratic restrictions. This might lessen or strengthen industry incentives to boost automation. 10 Increased recycling and the transition to a circular economy are two examples of global economic changes that could have a significant impact on the mining industry.

The economic effects of the COVID-19 pandemic are probably going to have an influence on these changes as well as interact with them. Understanding these dynamics is essential for both industry and academia to comprehend the industry's future directions and the repercussions for businesses, communities, and nations.

The global COVID-19 pandemic might end up being the most influential social and economic development in recent memory. It has had and will continue to have a significant impact on the mining industry. It is having an immediate effect on the sector's prices, output, and profits, which affects governments, communities, and shareholders. The impacts over the medium and long terms are far less certain. It is evident, however, that comprehending these effects is essential to guaranteeing that the mining industry can carry out generating income, paying taxes, and supporting the shift to a low-carbon economy.

III. Conclusions

The mining and metals industry has led an efficient response to the epidemic, despite the fact that it has been a genuinely disruptive occurrence. First, the effect is on daily activities and methods of functioning. In addition to taking steps like social distancing, customers lock down their websites and make an effort to run their businesses with the fewest employees possible. The vast majority of patrons are attempting to do business as usual. As a result, despite having fewer personnel on site, several mines have continued to function and produce during the pandemic. However, the additional costs of new processes, protocols, procedures, equipment for health testing, and staff assistance have made company continuity more expensive. The decrease in the cost of commodities that was observed during the start of the pandemic has been totally reversed in the last few

months.

It is imperative to stress that the majority of the previously mentioned issues posed challenges at various points throughout the mining project life cycle, even prior to the COVID-19 pandemic. For exploration and mining enterprises, the COVID-19 problem has, in several cases, turned simple to medium difficulties into insurmountable challenges.

Every country under analysis has mineral resources and operating mines that have an impact on the status of their economies. The deposit management policy is implemented in a number of ways, but in all cases, mining is done in operational plants, closed and reclaimed mines are closed, and new facilities are looked for and established.

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