

# Incentivising Non-Fuel Mineral Exploration in India

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Recommended citation:

Chadha, R; Sivamani, G; Bansal K; (2023). *Incentivising Non-Fuel Mineral Exploration in India* (CSEP Discussion Note 17). New Delhi: Centre for Social and Economic Progress.

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# Incentivising Non-Fuel Mineral Exploration in India

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## 1. Importance of Mining to the Indian Economy

India has a rich mining history, with evidence of terracotta bricks, workings of bronze, and precious metal jewellery dating back to the Indus Valley Civilisation, and the more recent Iron Pillar of Delhi (5<sup>th</sup> century CE). Over the centuries, mining has been the backbone of industrial development, providing the raw materials required for power generation, agriculture, infrastructure, and manufacturing. Today, India mines 88 non-fuel minerals, with production valued at over ₹2 lakh crores<sup>1</sup> (US \$28 billion) in 2021–22. The mining and quarrying sector is estimated to contribute 2.85% to the country's gross value added (GVA) and provides lakhs of jobs. With its downstream economic linkages, the sector generates indirect value addition and employment. For example, an investment of ₹1 lakh in the non-fuel mining sector can lead to a ₹50,822 increase in labour income, considering direct and indirect effects<sup>2</sup>.

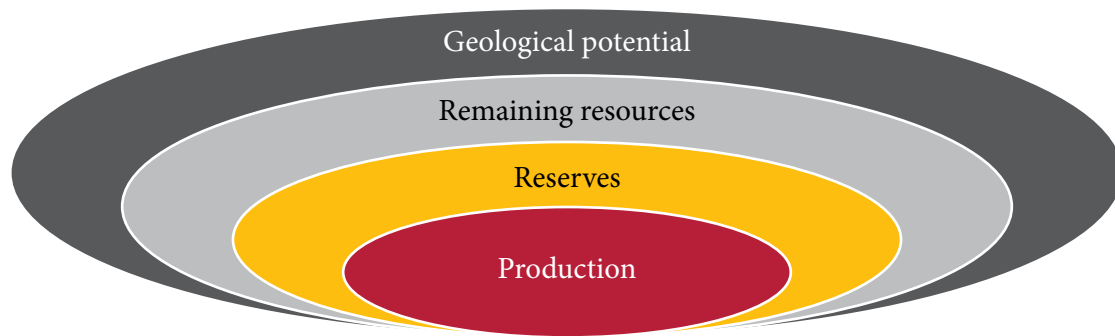
India has a vast mineral geological potential with a similar geological history to the mining-rich regions of Western Australia and Eastern Africa, and a large portion of it lies under some of the least-developed and densely-populated districts of the country. The operationalisation of mines in these areas can act as a catalyst for growth, creating much-needed jobs, increasing revenues to the states' exchequers, and providing for the mineral security of the nation. However, despite possessing known resources of some minerals such as potash and molybdenum, India remains import-dependent for many minerals, which affects the trade balance and increases the country's supply risks. This is particularly pronounced in the case of critical minerals required to manufacture green technologies such as wind turbines, solar panels, batteries, and electric vehicles (Chadha, Sivamani, & Bansal, 2023).

The mining sector faces several challenges that impede its sustainable growth. These include environmental concerns, community welfare, outdated equipment and technologies, poor worker safety, unskilled human capital, and inadequate infrastructure. Another crucial obstacle in India is the lack of adequate mineral exploration. Exploration is the first step in the lifecycle of a mine, where various techniques (such as aerial surveys, geological mapping, and geochemical analyses) are employed to determine the shape, size, grade, and distribution of a mineral resource. Each stage of exploration (reconnaissance, prospecting, and detailed exploration) improves the knowledge of the minerals: starting with the estimation of geological potential, resources, and reserves (i.e., economically mineable resources), and finally, production (Figures 1 and 2). However, it is estimated that only 10% of India's obvious geological potential (OGP) has been explored, and less than 1% of the global exploration budget is spent in India (Ministry of Mines, 2023b). India's mining potential remains underutilised (Bhandari & Kale, 2020). As a result, many minerals remain at the resources level, with further exploration required to take them to the reserves stage.

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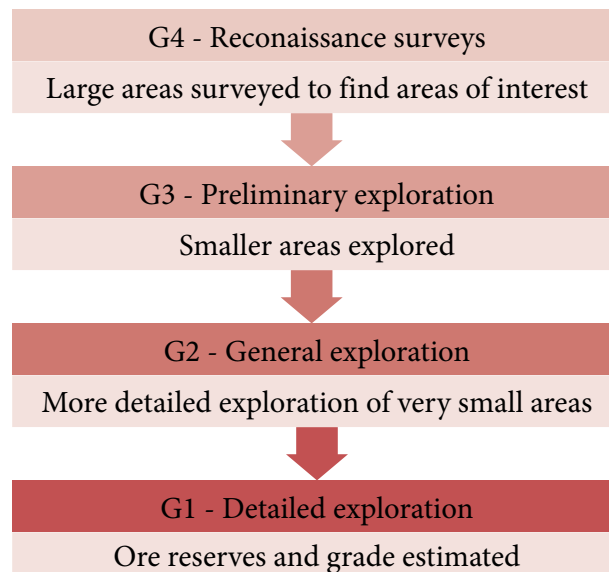
<sup>1</sup> 1 crore = 10,000,000; 1 lakh = 100,000

<sup>2</sup> The draft CSEP Environmentally-Extended Social Accounting Matrix for India 2019-20 has been used to compute these estimates.

**Figure 1: Geological Inventory Classification**

Source: United Nations (2020)

The complexity of exploration activities requires significant investments of time, finances, equipment, and specialised skills and knowledge. Only less than 1% of the explored projects become commercially viable mines (Victoria State Government, 2023). Thus, exploration is a highly risky venture. Globally, small and independent mining companies, referred to as junior explorers, invest their limited resources and niche expertise in risky exploration ventures to discover potential mines. These are often sold to larger mining companies to develop and operate, with the sale of a successfully discovered mine compensating for the expenses of the fruitless exploration projects.

**Figure 2: Stages of Exploration**

Source: United Nations (2020)

In the case of India, the existing policy framework should be made more conducive to mineral exploration. There have been a limited number of significant discoveries over the past three decades, many of which have been made by the Geological Survey of India (GSI), a governmental agency under the Ministry of Mines (MoM). However, India needs a new exploration framework that attracts and incentivises private investment in mineral exploration and does not majorly rely on public expenditure on high-risk ventures. This discussion note provides an overview of India's historical, current, and proposed exploration policies, good international practices, issues with the existing system, and recommendations for creating a globally-competitive exploration regime. Developing an efficient exploration ecosystem will enable India to harness its natural wealth, provide for impoverished communities, and secure its raw material needs.

## 2. Background on the Mining Policies of India

Mining is listed in the Concurrent List of the Indian Constitution; the Union and the state governments have respective powers to regulate the sector. The Union government can formulate legislation and policies for the mines and minerals sector, while the state governments implement these policies and regulate the industry. The Union government also has the power to form legislation on notified minerals (such as iron ore and bauxite), atomic minerals, and fuel (including coal and oil) minerals. The Mines and Minerals (Development and Regulation) Act, 1957 (MMDR Act), enacted by the Union government, is the principal legislation governing the mining sector in India.

### 2.1 MMDR Act before the 2015 Amendment

At the time of India's independence in 1947, mining was limited to mainly coal, iron ore, and some minor minerals, and the sector lagged in adopting international good practices. With the introduction of the MMDR Act in 1957, various laws relating to the sector were consolidated, with a focus on the technical development of the industry and environmental protection. However, over the next three decades, the sector continued to be dominated by government institutions, with little participation from the private sector, until India's economic liberalisation and the introduction of mining regulation reforms in the early 1990s.

The government released the National Mineral Policy (NMP) in 1993, which recognised the need for increased privatisation and Foreign Direct Investment (FDI) in the mining sector, including mineral exploration. In the 1994 amendment to the MMDR Act, the central government expanded the scope of the First Come, First Serve (FCFS) resource allocation method, allowing interested and eligible persons to apply for mineral concessions directly. In addition, post-1994, any company registered in India could apply for a Prospecting Licence (PL) or a Mining Lease (ML), which encouraged several international mining companies to invest in India (Table 1). In 1999, the MMDR Act was further amended to allow private-sector enterprises to apply for Reconnaissance Permits (RP). The Act also provided the holder of an RP or PL with a preferential right to obtain a PL or ML, respectively.

Table 1: Select Private Sector Exploration Investments in India (1993–2011)

Company	Investment	Area (km <sup>2</sup> )	Exploration Targets
Hindustan Zinc Ltd	\$8 million– \$9 million per annum	4,130	Zinc in Rajasthan
De Beers India Pvt Ltd	₹130 crores	80,160	Diamonds in Karnataka, Odisha, Andhra Pradesh
Rio Tinto India Pvt Ltd	₹150 crores	40,000	Diamonds, iron ore, and bauxite in Madhya Pradesh
Anglo American Group	\$5 million	30,000	Base metals in Rajasthan, Andhra Pradesh, Jharkhand
Vale India Private Ltd	₹10 crores– ₹12 crores	-	Bulk minerals, base metals, and platinum group elements (PGE) in Odisha, Maharashtra, and Andhra Pradesh
Adi Gold Mining Pvt Ltd	\$13 million	3.86	Copper-zinc-lead in Uttarakhand

Source: Ministry of Mines (2011)

The National Mineral Policy 2008 carried forward the spirit of NMP 1993, with the central government underscoring the importance of relying on private sector investment in reconnaissance and exploration. The NMP 2008 also noted that while prospecting and mining are considered independent activities, the ease of transferability of mineral concessions from the prospecting stage to mining is vital to develop the mineral sector.

The working group on Mineral Exploration and Development for the Twelfth Five-Year Plan made several recommendations to enhance private sector participation in exploration (Ministry of Mines 2011). Some of the recommendations in the report pertain to procedural delays in the applications for RPs and PLs, transparency in granting mineral concessions, and seamless transition from RP/PL to ML. The report recognised that auctioning already-explored RP/PL blocks, or reserving them for state-owned exploration companies, would significantly discourage private-sector investment. It also observed that private investment in exploration depends on the security of tenure and ease of transferability in mineral concessions and that investments during the preceding five years had been “grossly inadequate” and disproportionate to the country’s geological potential. Though the various post-liberalisation policy changes provided a fillip to the Indian mining sector, much more needed to be done to reach the standards of good international practices.

## **2.2 Supreme Court’s views on Mining Concessions in India**

As the mining sector appeared to be taking off in India, concerns began to emerge with the allocation of 2G spectrum licences and coal blocks in the early 2010s. In 2012, the Supreme Court passed its judgement on a petition challenging the FCFS method of allocating 2G spectrum licences (Centre for Public Interest Litigation v. Union of India, 2012). The court held that the FCFS method of allocating natural resources depends on the mere chance of allocation and is susceptible to manipulation, favouritism and misuse by the granting authorities. It further concluded that the authorities must adopt a transparent and reasonable method for granting licences so that all eligible persons are provided a fair and non-discriminatory opportunity to compete. Additionally, the court also suggested that a duly published auction conducted fairly and impartially would be the best method for transferring or distributing natural resources.

For further clarity on the permissible methods of allocating natural resources, the central government filed a Presidential Reference to the Supreme Court (Natural Resources Allocation, In Re., 2012). The court observed that while auctions may be the best way of maximising revenues, they may still not achieve the “common good” goal under Article 39(b) of the Indian Constitution. The court added that the “common good” is the sole principle for natural resource distribution, not just revenue maximisation. The court refused to suggest the most efficacious method for the disposal of natural resources, as that would be a matter of economic policy, which is not within the court’s purview.

Additionally, the Supreme Court gave its opinions on various aspects of natural resource allocation, emphasising that any allocation regime is a matter of government policy. It held that there could be exceptions to auctions as they are not the only method for distributing natural resources. The primary test for an efficient allocation process is that it must be “fair, reasonable, non-discriminatory, transparent, non-capricious, unbiased, and without favouritism or nepotism, in pursuit of promoting healthy competition and equitable treatment” (Natural Resources Allocation, In Re., 2012). The court observed that huge capital is involved in discovering natural resources through exploration and mining contracts. To minimise the risk undertaken for such exploration, a company would incur high costs only if it is assured of utilising any discovered resources. Exploration companies would not like to incur such high costs only to later compete in an open auction for their discovered resources (Natural Resources Allocation, In Re., 2012).

### 2.3 Current System of Mineral Allocation

To address the resource allocation system concerns, the MMDR Act was amended in 2015 such that mineral concessions would be granted through auctions instead of the FCFS basis. Subsequent amendments in 2019 and 2021 sought to further streamline the regulations. Along with the commencement of the auction regime, the District Mineral Foundation (DMF, a means to provide for the welfare of mining-affected communities) and the National Mineral Exploration Trust (NMET, to encourage exploration) were also introduced. Private mining companies may be granted mineral concessions only through a system of auctions and in either Mining Leases or Composite Licences (CLs). CLs, also known as prospecting licence-cum-mining leases, are granted for areas with inadequate evidence of the existence of the mineral and allow the leaseholder to also undertake exploration operations.

The auction process begins with the state government notifying an area for a CL or ML, based on the evidence of mineral contents. Then, the process is run through an online platform in two stages, the first stage determines the technically qualified bidders and the floor price for the second stage in which eligible bidders quote a percentage, above the floor price, of the value of the extracted minerals from an operational mine. The highest bidder would pay this auction premium to the respective state government on top of the existing royalties and other taxes (Chadha & Sivamani, 2021).

The Non-Exclusive Reconnaissance Permit (NERP) was also introduced in 2015 to enhance exploration activities. Any person holding a NERP for a given land had no preferential right to be granted a CL or ML for the same mineral block. However, the NERP was ineffective in encouraging exploration as it did not provide explorers with exclusivity or the right to mine to explorers. In the 2021 amendment to the MMDR Act, the NERP was discontinued.

### 2.4 National Mineral Exploration Trust (NMET)

As mentioned earlier, the MMDR (Amendment) Act 2015 introduced the National Mineral Exploration Trust (NMET) to expedite exploration. The mining companies must pay 2% of their due royalty to the NMET fund, which the government uses for exploration work. The 2021 Amendments to Sections 4 and 9C of the MMDR Act, 1957, stated that Notified Exploration Agencies (NEA) would be eligible for funding via the NMET. Any exploration agency accredited by the National Accreditation Board for Education and Training of the Quality Council of India (QCI-NABET) can apply to be notified under Section 4. The accreditation scheme provides detailed procedures and criteria to be met by the exploration companies (QCI-NABET, 2021). There are 40 NEAs listed by the MoM, of which 15 are private, and 25 are government agencies (Ministry of Mines, 2023c).

To receive funds for approved projects, NEAs must submit periodic reports to the respective state governments and the NMET (Ministry of Mines, 2022). The NMET funds different kinds of exploration at the G4, G3, G2 and G1 levels (Figure 2). It is also utilised to support baseline geoscience data generation by the GSI. Central and state government organisations can also submit proposals for financial assistance from the NMET in order to procure machinery and other equipment. An exploration project must adhere to the Schedule of Charges (SoC), which contains standardised basic costs for various exploration activities. The MoM recognised the need to incentivise greenfield exploration (G4) and has included an Exploration Incentive (EI) of 10% of the approved costs, which is applicable for exploring precious metals, base metals, strategic/critical minerals and fertiliser minerals. The EI will be paid if the explored block is upgraded from the G4 to the G3 stage, subject to the approval of the NMET Executive Committee (Ministry of Mines, 2020). This incentivisation mechanism is consistent with the recommendations of the Chawla Committee report on the allocation of natural resources (Government of India, 2011).



## 2.5 Ministry of Mines: Exploration License Proposal

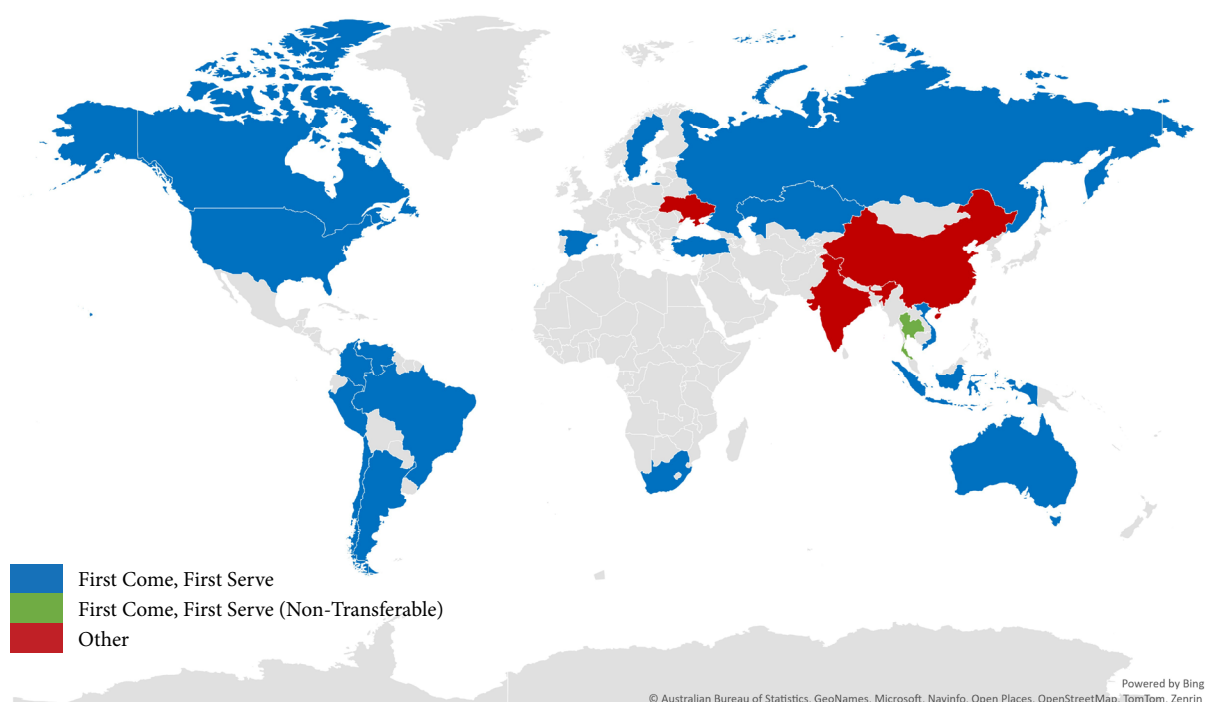
The National Mineral Exploration Policy, 2016 (NMEP) was introduced to encourage the participation of the private sector in exploration and to harness their technical expertise, technological capacity, and financial resources. To incentivise exploration, the NMEP stated that private agencies could receive a revenue share from the royalty or auction premia when the explored block is auctioned for mining. In furtherance of the NMEP 2016, the MoM issued a notice for public consultation in February 2023 proposing the introduction of Exploration Licences (ELs) to incentivise the exploration of deep-seated and critical minerals (the list of critical minerals would be specified in the MMDR Act). The proposed EL is yet to be tabled in Parliament.

The proposed EL for reconnaissance and prospecting would be granted through auctioning an area suggested by any person to the state government. Eligible explorers would bid on their desired percentage share of the auction premium payable by an eventual ML holder to the state government (contingent on a successful discovery and subsequent auction), with the lowest bid winning the EL auction. The state government must auction a successfully explored area within one year of submitting the geological report. The maximum proposed area of an EL is 1,000 km<sup>2</sup>, and no single entity holding an EL can acquire more than 5,000 km<sup>2</sup> in one state. The EL would be granted for five years, and by the end of three years, the holder must relinquish 75% of the area under the licence. An EL can only be extended for one year and cannot be further renewed.

### 3. Global Mining Policies

An effective mining policy that enables and promotes private sector investment must account for the security of the tenure of exploration licences and ease of transferability from exploration to mining concessions. Therefore, irrespective of the method adopted for allocating natural resources, FCFS or auctions, the government must incentivise companies that incur huge costs while exploring minerals. One such common mechanism is a preferential right over mining leases of resources explored and discovered by the mining company. Almost all mining jurisdictions, except Thailand, provide ELs through FCFS. The holder of an EL gets the preferential right to obtain a mining lease for the area explored.

Figure 3: Exploration regime for major mining jurisdictions



Source: Baker McKenzie (2020)

Governments also create additional safeguards, such as area and tenure limits, to reduce the risks of inefficient land use (Baker McKenzie, 2020). The exploration permits issued by some major mining countries, such as Australia, Canada, and Argentina, have areas that range between 100 km<sup>2</sup>–300 km<sup>2</sup>. Some of these countries also restrict the maximum area holding, such that a company cannot hold an area of more than 2,000 km<sup>2</sup>. Globally, exploration permits are typically granted for five years and are renewable for 2–5 years. In some countries, the tenure for the permit can be as low as one year without the provision of renewal. In many countries, the exploration permit will be cancelled if no exploration work has been carried out for a certain period. For example, in Canada, the permit can be revoked if no exploration activity is conducted for three years. In most major mining countries, companies have the right to mine any of their discovered resources.

## 4. Issues with the Current Exploration System

### 4.1 Issues with Auctions

In India, the existing auction regime leaves little space for the participation of private exploration companies (Kumar, 2019). Post the 2015 amendments to the MMDR, under the now-defunct NERP, any discovered mineral concessions would need to be auctioned, potentially leaving the explorer with no reward and only reimbursements of expenses. Additionally, irrationally high bids have been observed with various ML auctions, including some bids higher than 200% of the value of minerals. The Supreme Court had noted that a system of auctions has the potential for abuse, such as cartelisation and the “winner’s curse” (wherein the winning bid is higher than the actual value of the minerals) (Natural Resources Allocation, In Re., 2012). Furthermore, several auctioned greenfield mines (i.e., areas with no prior mining activities) are yet to be operationalised, and some companies have surrendered their lease to the government after winning the auction as they either found the projects unsustainable or refused to execute their lease deeds (Pradhan, 2021).

In 2021 the Mineral (Auctions) Rules, 2015 and Minerals (Evidence of Mineral Contents) Rules, 2015, were amended to expand the scope of CLs. All minerals with a G4 level of exploration could be auctioned for CLs as per the 2021 amendment. As a result, a record number of 52 CLs were successfully auctioned in 2022–23. While the policy changes introduced by the MoM have led to an increase in the allotment of CLs, over 70% have been for bulk minerals (bauxite, iron ore, limestone, and manganese ore<sup>3</sup>). The slack in exploring critical and deep-seated minerals is still a pressing concern. The current framework for auctioning CLs has yet to encourage private sector participation in the reconnaissance and exploration of such minerals. CLs are currently not allocated for reconnaissance or prospecting of unexplored areas below the G4 level, and in the absence of reconnaissance, further exploration of deep-seated minerals becomes challenging (Kumar, 2019).

### 4.2 Issues with NMET

The NMET was set up to encourage exploration activities and investment from private exploration agencies by providing financial incentives. The NMET merely reimburses exploration agencies for their expenses, and funding is not contingent on the successful mineralisation of the explored block. The NMET has approved the financing of 295 exploration projects, of which 81 have been completed. Private notified exploration agencies have applied for only three projects from the NMET, while the rest are being carried out by government agencies. Only two of the 15 Private NEAs have applied for NMET funding. The NMET has approved 118 projects for G4 stage exploration; all G4 stage projects, barring one, have been carried out by government agencies. While a 10% Exploration Incentive exists for greenfield exploration (G4) projects, private exploration agencies are still reluctant to apply for these high-risk projects.

Approximately 90% of the NMET expenditure has been towards projects under central government agencies (Table 2). The GSI is the nodal agency that implements exploration projects at the central level. The NMET also finances some baseline geoscience data mapping projects, primarily conducted by the GSI. Private exploration agencies have utilised less than 1% of the NMET expenditure. Globally, the right to the mineral concession is the key incentive that drives private sector investment, while under the NMET, no mining rights have been conferred on explorers upon successful exploration. Consequently, the NMET has not succeeded in increasing the participation of private exploration companies.

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<sup>3</sup> Notified minerals as per the Fourth Schedule to the MMDR Act

**Table 2: Exploration Expenditure under NMET (₹ lakhs)**

Exploration Level	Central Government	State Governments	Private Sector	Grand Total
G1	7,501	0	0	7,501
G2	13,270	2,793	0	16,063
G3	23,394	3,522	169	27,085
G4	19,540	2,242	263	22,046
Baseline	77,826	0	0	77,826
Others	48,156	5,575	0	53,731
<b>Grand Total</b>	<b>1,89,687</b>	<b>14,132</b>	<b>432</b>	<b>2,04,252</b>

Source: (Ministry of Mines, 2023a)

### 4.3 Issues with MoM Exploration Licence

One of the concerns regarding the proposed EL is that exploration companies will receive revenue for their work only after a successfully discovered mine is auctioned and operationalised. This may take years or may not even materialise, depending on the complexity of the deposit and geography and the time taken to receive necessary clearances. For example, the Ghorabhurani-Sagasahi Iron Ore Mine, a greenfield captive mine, was auctioned in 2016 and only started production in late 2021 – it took close to six years to receive the necessary clearances (Bansal & Kapoor, 2022). Additionally, the exploration company would receive only a share of the auction premium owed by the mining company to the state government, which would not be known until the auction takes place. Another concern is that ELs may only be granted for ‘certain deep-seated and critical minerals’. While the MoM proposes to publish a comprehensive list of critical minerals for the needs of today, it may be prudent to permit ELs for all minerals and allow exploration companies to decide which minerals require exploration attention. Thus, the proposed regime may not offer sufficient investment incentives for private explorers.

## 5. Recommendations

While the proposed EL is a step in the right direction, it may not be adequate in incentivising private-sector exploration. As the Supreme Court has observed, exploration companies would incur high and risky costs only if they are assured of utilising any discovered resources. Globally, junior explorers invest their finances and expertise into risky ventures, hoping to succeed and sell their discoveries to mining companies. India requires a competitive exploration industry to help uncover its vast mineral resources. While globally, FCFS is the most common method of allocating blocks for mineral exploration, the recommendations made in this section align with the auctions system preferred in India.

Currently, CLs may be granted through an auction if at least a reconnaissance survey has been completed or the mineral potentiality of the block has been identified based on available geoscience data. It allows concessionaires to undertake both prospecting and mining operations. However, the crucial reconnaissance step is missing in the current exploration policy, making discovering deep-seated and critical minerals more challenging. Therefore, instead of introducing a new licence for exploration, the existing CL regime should be tweaked to give impetus to the reconnaissance of deep-seated mineral exploration, as described below.

The existing Composite Licence regime can be extended to include specific components of the proposed EL. For greenfield blocks with no knowledge of the minerals' presence (i.e., below G4 level): (i) eligible parties should bid on the share of the value of the minerals that they would pay to the state government on successful discovery and mining; (ii) the proposed CL should expand its scope to allow reconnaissance and thus have a greater maximum area grantable to exploration companies; (iii) the reconnaissance component of the CL may be granted for an area up to 1000 km<sup>2</sup>, with safeguards in place to prevent companies from not conducting exploration activities within a specified time; the leaseholders could be required to periodically provide evidence of work done; and (iv) after three years of reconnaissance, the leaseholder should relinquish 75% of the original area. If there is sufficient evidence of mineral content, as per the existing CL norms, the leaseholder should be allotted an area of 25 km<sup>2</sup> within the explored area for further prospecting and subsequent mining of specific minerals. These recommendations would allow exploration companies to sell or mine any resources they discover.

While these recommendations ensure that CLs are granted only through auctions, a concern may be raised that without knowledge of either the minerals available in an unexplored block or their quantities and grades, the winning auction bid may not reflect the true value of the concession (e.g., a bid for low-grade iron ore will be different to a bid for gold ore). This may lead to lower revenues for state governments. However, mineral royalties already exist as a mechanism to receive consideration for extracting and utilising non-renewable resources and are based on the value of the extracted mineral.

India's mineral royalty rates are amongst the highest in the world (Chadha & Kapoor, 2022). Hence, the purpose of auctions should be to allocate mineral blocks to the most interested and eligible parties in an efficient, fair, objective, and transparent manner. Even if the auction earnings are dampened on a per-mine basis with this system, a more encouraging exploration regime will bring in far more investments, leading to increased discoveries and greater overall revenues, including royalties. Other revenue-raising mechanisms may also be considered if the shortfall is substantial. These could include higher royalty rates for CLs with reconnaissance, taxes on completing reconnaissance, and taxes on transferring leases.

These recommendations address the government's concerns about granting mineral concessions only through auctions. The needs of exploration companies are also met as they would have the right to mine their discovered resources through a seamless transition from reconnaissance to prospecting and mining. Developing a globally competitive exploration industry in India will enable the country to be self-sufficient in the raw materials needed for infrastructure, manufacturing, and the green transition.

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