GOVERNMENT OF INDIA
MINISTRY OF MINES
**RAJYA SABHA**
**UNSTARRED QUESTION NO.1554**
ANSWERED ON 05.08.2024

**DEPOSITS OF HEAVY METALS REQUIRED FOR CRUCIAL INDUSTRIES**

1554. SHRI KARTIKEYA SHARMA:

Will the Minister of MINES be pleased to state:

(a) whether the country has significant and financially viable deposits of heavy metals required for crucial industries such as the Li-Ion batteries, semiconductor technology, computing etc., if so, the details thereof;
(b) whether there is any mining and production in the country of critical metals such as cobalt, nickel, lithium, neodymium etc., if so, the details thereof and the projected demand of these metals in the next few years; and
(c) steps being undertaken to conduct the exploration and mining of such resources?

**ANSWER**

THE MINISTER OF COAL AND MINES

(SHRI G. KISHAN REDDY**)**

(a): India has some deposits of heavy metals and critical minerals essential for crucial industries such as Li-Ion batteries, semiconductor technology, and computing. However, the extent to which these deposits are significant and financially viable varies. These deposits are scattered across different regions of the country, with varying levels of accessibility and extraction feasibility. The details are as under:

1. Lithium - India has discovered lithium reserves in the states of Karnataka and Jammu & Kashmir.

2. Cobalt & Nickel - Cobalt, & Nickel is generally found in association with copper ores. Small deposits are known to exist in Odisha and Jharkhand. India's reserves are relatively modest.

3. Rare Earth Elements (REEs) - India has significant reserves of rare earth elements in the states of Andhra Pradesh, Karnataka, Odisha, and Kerala. The monazite sands in Kerala are particularly rich in REEs.

4. Graphite - India has substantial reserves of high-quality graphite. Graphite is found in Arunachal Pradesh, Jharkhand, and Tamil Nadu.

5. Further, as per National Mineral Inventory (NMI) as on 01.04.2020, the reserve/resources of critical minerals is given in Annexure-I.

(b): No. Currently, there are no working mining leases for cobalt, nickel, lithium, and neodymium in the country for production purposes.
However, India has mining and production of some critical metals, although it still largely depends on imports to meet its demand. There are 54 mining leases of critical minerals viz. graphite, rock phosphate and tin ore, in the country and the details are as follows :

| Mineral | Number of Leases | Working | Non-Working |
|---|---|---|---|
| Graphite | 32 | 9 | 23 |
| Rock Phosphate | 7 | 6 | 1 |
| Tin Ore | 15 | 5 | 10 |
| Grand Total | 54 | 20 | 34 |

The projected annual requirement of critical minerals such as cobalt, nickel, lithium, neodymium etc. in the next few years is as follows:

(in tonnes)

| Mineral | 2025 | 2026 | 2027 | 2030 |
|---|---|---|---|---|
| Cobalt | 17 | 49 | 147 | 3,878 |
| Lithium | 58 | 174 | 517 | 13,671 |
| Nickel | 2,629 | 3,057 | 6,663 | 17,492 |
| Neodymium | 223 | 261 | 830 | 766 |

(c): As regards the steps being undertaken to conduct the exploration of such resources, the Geological Survey of India (GSI) is involved in exploration of critical minerals/metals with special emphasis on exploration of areas, which are potential for critical and strategic minerals and has given thrust to increase the number of exploration projects across the country. GSI has increased its exploration projects for critical and strategic minerals from 118 nos. in 2021-22 to 196 nos. in 2024-25. Since amendment of MMDR Act, 2015, the details of cumulative resource augmented by GSI for critical and strategic minerals at various cut off and different average grade is as follows:

| S.No. | Commodity | Resource (in million tonnes) |
|---|---|---|
| 1 | Rare Earth Elements (REE) ore | 230.0 |
| 2 | Lithium | 12.3 |
| 3 | Gallium ore | 74.0 |
| 4 | Graphite ore | 32 |
| 5 | Niobium ore | 282.0 |
| 6 | Vanadium ore | 71.0 |
| 7 | Cobalt | 275 tonnes |
| 8 | Tin ore | 3.0 |
| 9 | Tungsten ore | 21.5 |
| 10 | Molybdenum ore | 1.7 |
| 11 | Platinum Group Elements (PGE) ore | 1.0 |
| 12 | Nickel ore | 4.7 |

In order to promote exploration of critical and deep-seated minerals, a new mineral concession namely, Exploration Licence has been introduced for 29 deep-seated minerals, of which many are of critical minerals, which will permit the licencee to undertake reconnaissance and prospecting operations for these minerals. GSI has handed over 20 blocks for auction as exploration license to State Governments of which 12 blocks are notified for auction by State of Rajasthan, Karnataka, Maharashtra, Andhra Pradesh, Madhya Pradesh and Chhattisgarh.

In order to encourage private participation in exploration, Ministry of Mines has notified 23 private exploration agencies (NPEAs). These agencies are taking up exploration projects through funding from National Mineral Exploration Trust (NMET).

As regards the mining of such resources, the Central Government has amended the "Mines and Minerals (Development and Regulation) Act, 1957", in 2023 to empower Central Government to exclusively auction blocks for 24 critical and strategic minerals mentioned in part D to the Schedule-I of the MMDR Act, 1957. So far, 14 critical mineral blocks [Mining Lease-2, Composite Licence-12] have been successfully auctioned having minerals viz., Lithium, Rare Earth Elements (REE), Graphite, Vanadium, Nickel, Chromium, Glauconite, Platinum Group of Elements (PGE) and Phosphorite. These blocks are spread across the States of Bihar, Madhya Pradesh, Karnataka, Odisha, Tamil Nadu, Uttar Pradesh and Chhattisgarh. Earlier, State Governments had auctioned 30 blocks of critical minerals. So far, a total of 44 blocks of critical minerals have been auctioned by the Central Government and various State Governments as per table given below:

| Mineral | Auctioned Blocks | Mining Lease | Composite Licence |
|---|---|---|---|
| Basemetal | 4 | 0 | 4 |
| Glauconite (Potash) | 5 | 0 | 5 |
| Graphite | 14 | 6 | 8 |
| Graphite Vanadium | 2 | 1 | 1 |
| Lithium and Rare Earth Elements (REE) | 1 | 0 | 1 |
| Nickel, Chromium and associated Platinum Group Elements (PGE) minerals | 4 | 0 | 4 |
| Phosphorite | 6 | 1 | 5 |
| Rock Phosphate | 4 | 1 | 3 |
| Graphite and Manganese | 2 | 2 | 0 |
| Basemetal & Associated Minerals | 2 | 0 | 2 |
| Grand Total | 44 | 11 | 33 |

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Reserves/resources of Critical minerals as per NMI as on 01.04.2020

| Sl.No. | Mineral | Unit | Reserve | Remaining Resources | Total Resources |
|---|---|---|---|---|---|
| 1. | Cobalt (Ore) | Million Tonnes | 0 | 45 | 45 |
| 2. | Graphite | Tonne | 85,63,411 | 20,30,60,176 | 21,16,23,587 |
| 3. | Molybdenum | | | | |
| | Ore | Tonne | 0 | 2,72,03,398 | 2,72,03,398 |
| | Contained MoS2 | Tonne | 0 | 16,890.56 | 16,890.56 |
| 4. | Nickel Ore | Million Tonnes | 0 | 189 | 189 |
| 5. | Rock Phosphate | Tonne | 3,08,76,093 | 28,03,77,392 | 31,12,53,485 |
| 6. | Platinum group of metals (PGM) | Tonnes of Metal Contained | 0 | 20.92 | 20.92 |
| 7. | Potash * | Million Tonnes | 0 | 23,091 | 23,091 |
| 8. | Rare Earth Elements (REE) | Tonne | 0 | 4,59,727 | 4,59,727 |
| 9. | Tin | | | | |
| | Ore | Tonne | 2,101 | 8,37,20,794 | 8,37,22,895 |
| | Metal | Tonne | 973.99 | 1,02,782.91 | 1,03,756.90 |
| 10. | Titanium @ | Tonne | 1,59,98,625 | 41,11,08,526 | 42,71,07,150 |
| 11. | Tungsten | | | | |
| | Ore | Tonne | 0 | 8,94,32,464 | 8,94,32,464 |
| | Metal | Tonne | 0 | 1,44,650.07 | 1,44,650.07 |
| 12. | Vanadium | | | | |
| | Ore | Tonne | 0 | 2,46,33,855 | 2,46,33,855 |
| | Contained V2O5 | Tonne | 0 | 64,594.01 | 64,594.01 |
| 13. | Zircon | Tonne | 6,69,466 | 16,74,435 | 23,43,901 |

Figures rounded off

*contains glauconite, polyhalite, sylvite.

@ contains ilmenite, rutile, leucoxene and anastase.