



GSI Discovers Lithium Resources in J&K

Prelims: Geological Survey of India, Lithium reserves and its importance

Mains: Mineral & Energy Resources

Why in News?

The [Geological Survey of India](#) has for the first-time established [Lithium](#) 'inferred' resources(G3) of 5.9 million tonnes in **Salal-Haimana area of the UT of Jammu & Kashmir**.

What are Inferred Resources?

- The “inferred” mineral resource is a resource for which **quantity, grade and mineral content are estimated only with a low level of confidence.**
- It is based on information gathered from locations such as outcrops, trenches, pits, workings and drill holes that may be of **limited or uncertain quality**, and also of lower reliability from geological evidence.
- It is based on the classification from **United Nations International Framework Classification for Reserves/Resources - Solid Fuels and Mineral Commodities of 1997 (UNFC-1997).**

What is UNFC-1997?

- **UNFC-1997** is a system for the classification and reporting of reserves and resources of solid fuels and mineral commodities and provides a standardized, internationally recognized system for the reporting of reserves and resources.
 - It has been developed by **the UN Economic Commission for Europe.**
- It **promotes transparency and consistency in the reporting** of mineral and energy assets and ensures that geological, engineering, and economic information is used consistently.
 - It provides a **basis for comparing reserves and resources data** between countries and regions which is widely used by governments, industry, and financial institutions around the world.
- According to UNFC-1997, there are four stages of exploration for any mineral deposit:
 - **Reconnaissance (G4)**
 - **Preliminary exploration (G3)**
 - **General Exploration (G2)**
 - **Detailed Exploration (G1)**

What is Lithium?

- **About:**
 - Lithium (Li), sometimes also referred as **'White gold'** due to its high demand for

rechargeable batteries, is a soft and silvery-white metal.

▪ **Extraction:**

- Lithium can be extracted in different ways, depending on the type of the deposit — generally either through **solar evaporation of large brine pools**, or from **hard-rock extraction of the ore**.

▪ **Uses:**

- Lithium is an important component of **electrochemical cells** used in batteries of EVs, Laptops, Mobiles etc.
- It is also used in **thermonuclear reactions**.
- **It is used to make alloys** with aluminium and magnesium, improving their strength and making them lighter.
 - **Magnesium-lithium alloy** - for **armour plating**.
 - **Aluminum-lithium alloys** - in **aircraft, bicycle frames and high-speed trains**.

▪ **Major Global Lithium Reserves:**

- Chile > Australia > Argentina are top countries with Li reserves.
- [Lithium Triangle](#): **Chile, Argentina, Bolivia**.

▪ **Lithium Reserves in India:**

- Preliminary survey showed estimated lithium reserves of 14,100 tonnes in a small patch of land surveyed in **Southern Karnataka's Mandya district**.
- Other **potential sites**:
 - Mica belts in **Rajasthan, Bihar, Andhra Pradesh**.
 - Pegmatite belts in **Odisha and Chhattisgarh**.
 - **Rann of Kutch** in Gujrat.

How India Currently Fulfills its Lithium Demand?

- India is currently **dependent on imports for lithium cells** and batteries. **Over 165 crore lithium batteries** are estimated to have been **imported into India between FY17 and FY20** at an estimated import bill of upwards of \$3.3 billion.
- The country's efforts to secure lithium sourcing agreements are seen as a move against imports from China, which is the major source of both raw materials and cells.
- India is perceived as a **late entrant into the lithium value chain**, entering at a time when the EV sector is expected to undergo significant disruption.
- **2023 is considered a turning point for battery technology**, with the potential for several improvements to the Li-ion technology.

What is the Significance of Discovery?

▪ **Assistance in Achieving Targets:**

- India has pledged to reduce its emissions towards [net zero by 2070](#), which requires the availability of lithium as a critical component in electric vehicle (EV) batteries.
- The [Central Electricity Authority of India](#) has **estimated that the country will need 27 GW of grid-scale battery energy storage systems by 2030**, which will require massive amounts of lithium.

▪ **Addressing Global Shortages:**

- The [World Economic Forum \(WEF\)](#) has **warned of global lithium shortages** due to rising demand for EVs and rechargeable batteries, which is estimated to reach 2 billion by 2050.
- The world's supply of lithium is under strain due to the **concentration of resources in a few locations with** 54% of the world's Lithium reserves are found in **Argentina, Bolivia and Chile**.
- The [International Energy Agency \(IEA\)](#) **predicts** that the world could face **lithium shortages by 2025**.

What is Geological Survey of India?

- Presently, GSI is an attached office to the **Ministry of Mines**. It was **set up in 1851 primarily to find coal deposits for the Railways**.

- Over the years, it has grown into a **repository of geo-science information** and also has attained the **status of a geo-scientific organization** of international repute.
- It is headquartered in **Kolkata** and has **six regional offices** located at Lucknow, Jaipur, Nagpur, Hyderabad, Shillong and Kolkata. Every state has a state unit.
- **Central Geological Programming Board (CGPB)** is an important platform of the Geological Survey of India (GSI) to facilitate discussion for synergy and to avoid duplication of work.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Q. Which one of the following pairs of metals constitutes the lightest metal and the heaviest metal, respectively? (2008)

- (a) Lithium and mercury
- (b) Lithium and osmium
- (c) Aluminium and osmium
- (d) Aluminium and mercury

Ans: (b)

Exp:

- Light metals are metals of low atomic weight while heavier elements generally have high atomic weight.
- Osmium is a hard metallic element which has the greatest density of all known elements. Osmium has an atomic weight of 190.2 u and its atomic number is 76.
- Lithium having an atomic number 3 and atomic weight of 6.941u is the lightest known metal.
- **Therefore, option (b) is the correct answer.**

Source:IE

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