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ANALYSIS**

TOPIC

**India joins the race for lithium
reserves**

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INDIA JOINS THE RACE FOR LITHIUM RESERVES

In News

It has been observed that India's lithium discovery could transform the country .

About Lithium

- Lithium is a non-ferrous metal and is the **lightest** and the least dense of all metals.
- Being the third element in the periodic table after gases hydrogen and helium, the alkali metal lithium is highly reactive.
- It is sometimes dubbed '**white gold**', in what has been called the "**new era gold rush**".
- **Applications** : Lithium is a critical component used in the production of **batteries for electric vehicles**, cell phones, computers, and other gadgets.
 - ♦ With its use case spanning the domains of defence, aviation and energy, it is viewed as a strategic material.

Reserves:

The US Geological Survey has estimated the global resources of lithium at 98 million tonnes (mt) in 2022.

- **Argentina, Bolivia, and Chile**, collectively referred to as the **Lithium Triangle**, account for roughly **53.1 percent of the global lithium resources**.
 - ♦ The global production of lithium in 2022 was estimated at 130 thousand tonnes with **Australia being the largest producer** followed by Chile, China and Argentina

Importance for India

- India's rising energy demands have placed a significant emphasis on securing sustainable and clean energy resources.
- India has set an ambitious target of achieving a **500 GW capacity** of **non-fossil fuels-based energy** and reducing CO2 emissions by 1 billion tons by 2030.
 - ♦ Lithium-ion batteries are used in wind turbines, solar panels, and electric vehicles, all of which are crucial in a green economy.
- Therefore significant **increase in electric vehicle adoption** is required to achieve this goal .
- Currently, India is completely import-dependent for minerals like lithium, nickel, and cobalt.
 - ♦ Presently, the two blocks of lithium reserves, one each in Jammu and Kashmir and Chhattisgarh, are up for auction for a composite licence.
 - Exploration is planned in Madhya Pradesh, Gujarat, Chhattisgarh, Karnataka, Jharkhand, Andhra Pradesh/ Telangana, Goa, West Bengal and Rajasthan.

Challenges and Concerns

- **Environmental** : Lithium mining is **resource-intensive**, and the mineral waste produced can further **pollute water and soil**, affecting local inhabitants, agriculture, and biodiversity and releases considerable air pollution.
- **Technological** : India currently has a limited presence in the global supply chain for Advanced Cell Chemistry (ACC) technologies.
 - ♦ India also does not have lithium extraction technologies.
- **Competition with China** : According to the International Energy Agency, China's share of processing is close to 60 per cent for lithium.
 - ♦ China has made significant investments in overseas assets in Australia, Chile, DRC, and Indonesia.
- **Cost of refining lithium** in which India has yet to gain experience.

Steps of India

- **Global corporations** : India leverages **diplomatic ties** for strategic mineral collaborations with resource rich countries .
 - ♦ India signed an **MoU with Australia's Critical Minerals Facilitation Office (CMFO)** in June 2020, followed by a detailed agreement in March 2022.
 - This partnership, backed by a joint investment commitment of \$6 million with equal partnership, focuses on joint due diligence for lithium and cobalt assets in Australia
 - ♦ India joined the **Mineral Security Partnership (MSP)** in June 2023, becoming the **14th member** alongside countries like the **US, UK, Canada, Australia, South Korea, and Japan.**
 - ♦ In January 2024 ,**India Signed Agreement** for Lithium Exploration & Mining Project in **Argentina**
- **Domestic** : The government has introduced the **Production Linked Incentive Scheme for the 'National Program on Advanced Chemistry Cell (ACC) Battery Storage'** with an outlay of 18,100 crore, with the goal of achieving a manufacturing capacity of 50 GW Hour of ACC battery storage
 - ♦ In July 2023, **the Mines and Minerals (Development and Regulation) (MMDR) Act 1957** was amended through the MMDR Act 2023 to increase exploration and mining of critical minerals with an objective to achieve self-sufficiency.

Conclusion and Way Forward

- Today, lithium is an essential part of virtually all electric vehicle batteries and those used in consumer electronics.
- India needs a two-pronged approach to developing its lithium capabilities. On one hand, it needs to tackle the technical hurdles, and on the other, it needs to manage the socio-environmental impact of these activities.
- India may need to devise a strategic funding mechanism for co-financing projects to secure strategic minerals like lithium in order to support domestic manufacturing of batteries necessary for the growth of the EV ecosystem.
- Besides domestic exploration, India needs to bolster its **international engagements** and undertake **joint exploration activities** for ensuring uninterrupted access to these critical minerals
 - ♦ India could learn from the experiences of South American countries, especially the 'lithium triangle' of Bolivia, Chile, and Argentina
- In conclusion, India's recent discovery of lithium reserves is a significant step towards achieving energy security and environmentally friendly transportation.

Mains Practice Question

With the global impetus towards renewable energy and the electrification of transportation, the importance of lithium as a key component has become paramount. In light of the above statement ,Discuss the challenges faced by India in Lithium mining and exploration. Suggest measures to be taken for facing these challenges.