

Lithium Deposits in India [UPSC Notes]

India has found 5.9 million tonnes of lithium reserves in the Reasi district of Jammu & Kashmir. This may be the seventh-largest deposit of the rare element, accounting for roughly 5.7% of all the reserves in the world. They are also said to be of a higher grade 550 parts per million (ppm) against the average 220 ppm making them highly lucrative.

This is a significant discovery for the country but one that is also fraught with risks both environmental and social. Learn more about this significant development for the [UPSC exam](#).

Lithium Reserves in India

Lithium's discovery in Jammu and Kashmir is possibly not the element's first discovery in the nation. Around 1,600 tonnes of lithium reserves were found in Mandya, Karnataka. But there hasn't been any commercial supply of the metal from that site till now.

- In addition to that, the government is also running a Lithium exploration program in several other states including Arunachal Pradesh, Andhra Pradesh, Chhattisgarh, Jharkhand, Jammu & Kashmir and Rajasthan.
- Currently, India is dependent on imports. In fiscal 2022, India imported lithium and lithium ion worth almost ₹14,000 crores. The demand is likely to explode in the future.
- With 50% of the deposits concentrated in three South American countries—Argentina, Bolivia, and Chile—the lithium triangle is where the majority of the world's lithium reserves are located. China, on the other hand, has an advantage over other nations and is in charge of 75% of the world's lithium refining.

Uses of Lithium

Lithium is used in many industries and its usage is going to significantly increase in the coming decades.

- Lithium is a soft, shiny grey metal found in the earth's crust. It is a highly reactive and alkaline metal.
- It is mainly used in ceramics and glasses, greases, pharmaceutical compounds, air conditioners and aluminium production, etc.
- Its main use is in batteries due to its highest energy storage capacity per kilogram. Its high energy storage capacity combined with its extremely light weight makes it a perfect choice for electric car makers like Tesla. =

Lithium Discovery in India Importance

- With the demand for [electric vehicles](#) increasing, the debate over global reserves of lithium has been gaining momentum. At the current rate of carbon emissions, the world will need at least 2 billion (200 crores) EVs, and according to the [World Economic Forum](#) (WEF), there could be a lithium shortage as soon as 2025.
- Apart from EVs, lithium also finds use in the medical sector and in electronics that power our phones, solar panels, and other renewable technologies needed for the transition to clean energy. The discovery could usher in a new era not only for India but also for the world.
- China is the largest market for electric vehicles, it controls both the supply and demand side of the lithium industry. It controls over half the global lithium processing and almost 75% of cell components and battery cell production in the world.
- The proliferation of EVs could mean India becoming dependent on China. J&K's reserves, however, provide a major opening for India to be self-reliant. The discovery of a massive reserve in India now sparks hope for the country, which has largely remained import-dependent for the mineral.

Challenges with Lithium Mining

There are some associated challenges with the mining of lithium. They are as follows.

- **Environmental Impact:** It can have adverse impacts on the environment, water, soil and air pollution. Extracting lithium from its ore is highly water-intensive, taking about 2.2 million litres of water for one tonne of lithium.
- **Impact on Himalayan Ecosystem:** The Himalayas are a highly fragile and eco-sensitive region and the recent [Joshimath subsidence](#) shows, it is vulnerable to long-term adverse consequences of unplanned development works.
- **Loss of Biodiversity:** The Himalayan region between J&K is an eco-sensitive region, and mining could lead to a significant loss of biodiversity.
- **Effect on River Systems:** The Himalayas are a source of so many rivers, any mining activity is going to pollute the entire riparian ecosystem.
- **Food Security Issues:** Mining and processing lithium can further jeopardise food security through its excessive carbon emissions, water, and land use methods. In Chile, 500,000 gallons of water yield one tonne of lithium.
- **Local Water Basic Contamination:** In areas that already struggle with clean water availability and accessibility, lithium water-mining techniques could cause local water basins to be contaminated, and use an already scarce water supply meant for rural communities, livestock, and crops.

Conclusion

- Before moving forward with lithium mining projects there is a need for fair and thorough assessments of its effects on agricultural production because this sector is already susceptible to climate change.
- The automotive industry, from two-wheelers to passenger cars and commercial vehicles, is shifting toward electric motion.
- Therefore if lithium is extracted in a sustainable and inclusive manner, the deposits could be a game changer for India as it lacks in traditional energy resources other than coal.