

Lithium-ion Mining and its Possible Impact In India: An Enviro-legal Analysis

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ABSTRACT

Currently the biggest use of lithium is in the production of Lithium-ion batteries, which allow for competitive electric cars to enter the market, which otherwise would remain monopolised by the Petroleum auto-mobiles. In addition, the Li-ion batteries are used in electronics, for wind energy, as well as to store other forms of energy. The substitute to li-ion is however, not as good. Lithium batteries are more high density, and thus, can store more energy at a time; they can be recharged thousands of times, which in turn reduces e-waste; and the other forms of batteries are not as cost effective, and with as enhanced performances. And therefore, in this regard, it can be stated that at least at the present times, li-ion batteries are not only being used because they cost less, but rather, also because they have several added advantages, including the reduction of e-waste, which is considered as an environmental hazard in itself.

Key words : Lithium-ion mining, Lithium batteries, Enviro-legal Analysis

Introduction

The past decade has seen an astounding increase in the demand for lithium, primarily due to the increasing use of lithium - ion batteries in electrical products such as mobile phones, and most notably in electric vehicles.

In the recent years, it has been observed that air quality has been deteriorating in almost all parts of the World, including India. There have been two major contributors to the air pollution worldwide, which are energy production through conventional means (Not including nuclear energy), and the pollution which is caused because of cars. The solution to these two problems are firstly, to switch to renewable mode of energy production from the conventional ones; and secondly, switching to electric vehicles from the ones running on conventional

sources. And the common ground in both these new approaches is one: *batteries*

Lithium-ion batteries were first started to be used in the 1970s, and ever since, their use has grown substantially. In the past decade itself, with the World seeing a tectonic shift in the practices which harm the climate, the use of lithium-ion batteries have seen a huge increase, particularly in the electric vehicles. In the backdrop of this increase in the use of lithium-ion batteries, questions have also simultaneously being asked over the environmental impact of such large-scale lithium mining, which is the main element used in majority of the batteries being manufactured currently.

The Environmental Impact of Lithium Mining

With the increase in the demand for lithium, the mining activity for this metal has also increased sub-

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stantially. Lithium is an alkali metal which is comparatively difficult to extract because of its density. (Christopher McFadden, 2021). Lithium is sourced mainly from salt brine and spodumene, of which the South America and Australia have the largest reserved. However, recently, several important studies and tests have also shown that India also has some reserves of this important metal. However, lithium mining is considered dangerous for the environment. There are several important aspects of the mining process which pollute and degrade the environment.

Water Pollution and Over Usage

Lithium mining and extraction causes widespread pollution of water bodies which are near the mine. For example, in the year 2016, in *Tagong*, a town which is near the Ganzizhou Rongda Lithium mine in the Tibetan Plateau, experienced the Liqi River undergoing severe toxic pollution, which resulted into thousands of dead fish, as well as dead cattle which live beside the river. On similar lines, in South America, where lithium mines are present in Bolivia, Argentina, Chile, which are considered as one of the driest places on Earth, the lithium mining extraction process takes an approximately 500,000 gallons of water per tonne of extracted lithium. Even though the process is cheap, however still, the use of water can be disastrous for the ecosystem where the mines are located. The large evaporation pools, which are used so that water can evaporate and the lithium extracted, can be leading causes of water toxicity and scarcity.

Soil and Air Pollution

Even though the major concern with lithium is extraction is the effect on water bodies, and the use of water, soil and air of the area wherein such extraction takes place also get severely affected. A report on lithium extraction by *Friends of the Earth Europe Charity* stated. "The release of such chemicals through leaching, spills or air emissions can harm communities, ecosystems and food production." (Jacob Koshy, 2020).

Child Labour

Furthermore, while this doesn't fall under the environmental impact, there have been several reports that the lithium mines in countries such as Bolivia, which is the largest producer of lithium, child labour is used. In this regard, the enforcement agencies

would also have to note this aspect of mining.

India – Lithium Reserves

India currently imports all the lithium that it requires. To put this into perspective, the import bill of lithium in India amounted to \$ 1.2 billion, up from approximately \$384 million in Financial Year 2017-18 (Jacob Koshy, 2020). Furthermore, this does not include the lithium ion which India already imports as part of another product, such as electrical appliances, cars, etc., wherein lithium-ion batteries comes as a part of the product. Additionally, the demand for lithium has only started to increase in the previous years.

However, to combat this, as well as to reduce its import bill, and to increase the local manufacturing of lithium - ion batteries, the Geological Survey of India has been working on 7 sites for finding possible lithium deposits. In this regard, one deposit of lithium reserve has been found in India in Mandya, a village near Bengaluru. It is estimated that in the said reserve, approximately 14,100 tonnes of lithium could be extracted. Even though this figure is substantially less than the reserves in countries such as Bolivia and Australia, however still, this would provide a start to lithium extraction in India.

Furthermore, India's first lithium plant has now been set up in Gujarat, wherein Lithium ore is used to make base battery material (Shrivastava, 2021).

Thus, the setting up of plants, along with India discovering lithium reserves domestically, are bound to increase the production of lithium in India. However, with the increase in lithium production, the environmental concerns would also increase.

Mining in India: The Role of Courts

The Indian Mining sector is more often than not, engaged in different controversies, from violating the regulatory framework, to over - extraction, to causing irreparable harm to the environment, etc. In this regard, the Courts in India have usually been on the side of sustainable development, one which should not cause an irreparable harm to the environment.

The National Green Tribunal in this regard in India is one of the most active environmental courts in the World, with a plethora of orders and judgements passed by it in the past decade with regards to environment protection. Mining, in general, is considered to be a dangerous practice of the environment of the surrounding areas.

The Supreme Court, starting from 1991, in the case of *Subhash Kumar v. State of Bihar*, took note of the pollution discharge of coal washeries in Bokar, and stated that a right to a clean environment fell under the Right to Life and Liberty enshrined under Article 21 of the Constitution of India.

Similarly, the case of iron ore mining in Karnataka has been a landmark case showing over mining, illegal use of land, poor governance of mining activities, as well as corruption. The Supreme Court in this case, passed a plethora of orders, ranging from ordering a full-scale enquiry into the mining operations, banning mining operations in Bellary district, and in Tumkur and Chitraguda districts, etc.

This ban was finally lifted in 2013, with the Supreme Court noting strong objections to the environmental impact of the whole mining operations by stating, *"in the past when mining leases were granted, requisite clearances for carrying out mining operations were not obtained which have resulted in land and environmental degradation. Despite such breaches, approvals had been granted for subsequent slots because in the past the authorities have not taken into account the macro effect of such wide-scale land and environmental degradation caused by the absence of remedial measures (including rehabilitation plan)"*.

The National Green Tribunal (NGT), which had been established in the year 2011, has since taken over reigns of dealing with environmental cases, and has since passed several orders against the Government, as well as mining corporations, in case of any violation of environmental laws, or for degradation of the environment. For example, in the case of illegal mining in the area of Lidhorahat Ghat in district Sagar, Madhya Pradesh, the NGT directed for the inclusion of certain mandatory provisions in the institutional framework and enforcement mechanism of mining. Similarly, the NGT also had noted that Environment Ministry's notification wherein it allowed sand mining to be allowed without public consultation and Environment Impact Assessment Report to be against the 2016 sustainable sand mining guidelines.

Therefore, in this regard, it needs to be noted that the environmental jurisprudence in India has developed a lot in the past few decades, with several important amendments to the Mining Act, and other related Acts also been passed by the Government, as well as regular intervention by Courts and Tribunals, and thus, after considering the fact in the case

of lithium mining, research has shown, the harm to the environment is sometimes greater. Furthermore, water is an integral part of extracting lithium, and thus, huge amount of water is required on a daily basis in the process of extracting lithium. For example, the lithium reserves found in Mandya, a village near Bengaluru, may not get the environment clearance as easily, or that it may be restricted from using as much water as is usually required for lithium extraction.

However, while it isn't being said that either the NGT or the Supreme Court would compulsorily stop the mining operations of lithium, but rather, that the mining operations would need to be done in a sustainable manner, and therefore, might see the intervention of the Courts in case of serious harms being caused to the environment.

Conclusion

Therefore, to conclude what has been detailed above, with the increase in demand for lithium, the mining operations for the metal have been increasing at an unprecedented rate. Additionally, the mining operations undertaken to mine lithium affects the environment, and the biodiversity of the said place adversely, and is thus, harmful for the environment.

India has started to produce batteries from lithium ore, and can be assumed to also start extracting lithium in the coming years. And while this would in general be beneficial for the domestic industry of India, the environmental impact of such activities would need to be closely scrutinised by the authorities, so that no long-term impact takes place on the environment and biodiversity of the area involved, particularly, with regards to the use of water in the mining process.

However, it still needs to be asked as to whether or not lithium extraction is purely a dirty investment or can it be considered as a sustainable business? As is known, currently the biggest use of lithium is in the production of Lithium-ion batteries, which allow for competitive electric cars to enter the market, which otherwise would remain monopolised by the Petroleum auto-mobiles. In addition, the Li-ion batteries are used in electronics, for wind energy, as well as to store other forms of energy. The substitute to li-ion is however, not as good. Lithium batteries are more high density, and thus, can store more energy at a time; they can be recharged thousands of

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