



## Research Paper

**Legal framework for exploration, production, development and exploitation of lithium; with emphasis on environmental rights and sustainable development dimensions**Mohammad Ali Kafaefar , Fardin Hemmati Mamo 

- 1- Assistant Professor, Department of Law, Qom Branch, Islamic Azad University, Qom, Iran.
- 2- PhD student in International Law, Qom Branch, Islamic Azad University, Qom, Iran.

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**Abstract**

Today, the issue of environment is one of the most important challenges in all countries, especially industrialized countries with high population. In a way, the environment is related to all jobs and equipment. It is important to pay attention to it, especially in the field of household and industrial waste. Today, due to the production and increase in the use of electric cars, the consumption of lithium batteries has increased significantly. They are lighter than other batteries and on the other hand, they produce more energy. For this reason, the customers and consumers of these batteries is increasing. This increase in use brings concerns about the effect of these batteries on the environment, and the method of extracting and recycling them is of particular importance. And from the point of view of rights and sustainable development, this issue is considered a serious threat to the environment, although the extraction of this metal has a high value in the economic cycle, but it will cause major losses to the environment, which until now, the countries of Korea and Japan in the extraction and its exploitation has been pioneered, therefore, according to the mentioned cases, we intend to conduct a comprehensive review of the subject with the method of field collection and library collection tools.

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<b>Corresponding Author:</b> Mohammad Ali Kafaefar	<a href="https://orcid.org/0009-0000-5132-4708">https://orcid.org/0009-0000-5132-4708</a>	
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## Extended Abstract

### Introduction

As the world strives to use clean fuels instead of fossil fuels to help the environment, the environmental impact of finding the required lithium may become a major problem. Mining lithium is harmful to the environment and an alternative must be found. Lithium is the most common metal used for new energy applications in the world. In the global electric vehicle industry, lithium batteries are widely used. Although lithium batteries as a new energy have a significant development status. However, it should be noted that many people are still concerned about the impact of mining lithium resources on the environment. The world's largest and most abundant lithium deposits are in Bolivia and Afghanistan. Since various countries have extensive plans to reduce and eventually eliminate carbon dioxide from gasoline fuel in vehicles, the discovery of lithium reserves is of great importance. The need for lithium is increasing and its cost has doubled between 2016 and 2018, which could be a reason for its indiscriminate extraction and subsequent environmental damage to the environment. Therefore, in this study, we seek to comprehensively and comprehensively examine the present issue.

### Theoretical foundations

Today, environmental degradation directly affects the economic trends of countries around the world. Soil erosion, thinning of the ozone layer, air pollution, an increase in the number of dangerous floods due to deforestation and climate change all have a negative impact on human life. Pastures and oceans have been exploited to the limit and their fertility has been continuously reduced. Lithium extraction is also not without its impact on environmental degradation. Environmental rights - in the modern sense of the term - are the product of environmental crises after World War II and also of critical movements of modernity.

The legal foundations of the environment can be divided into two categories; one is international and the other is national. International environmental law includes a large number of international treaties, binding resolutions and international organizations, as well as texts of non-binding resolutions, which are important. International environmental law is a set of international rules that address the prevention and protection of the environment. The basis of international environmental law is the Stockholm Conference, the basis of which was the human environment, and its results are included in Principles 2 to 7. In domestic law, Article 50 of the Constitution stipulates: In the Islamic Republic of Iran, protecting the environment, in which the present and future generations must have a growing social life, is considered a public duty. Therefore, economic and other activities that are associated with environmental pollution or its irreparable destruction are prohibited.

#### 1- The principle of the obligation and generality of environmental protection against lithium extraction

Article 50 of the Constitution considers environmental protection against the extraction of various minerals and metals, and in particular the extraction and extraction of various metals, including lithium, to be a duty and obligation, not a choice, and considers this duty to be related to the general public and each individual in the country, not to a specific individual or group. Therefore, the environment is for everyone, not to a specific individual or group, and therefore it is referred to as the common heritage of humanity. From the perspective of legal requirements, it should also be acknowledged that the role of customary international law in the environment, especially in cases such as lithium extraction, has been increasing sharply in recent years, and the reason for this increase in the importance of customary international law in the environment should be sought in the fact that many treaties in the field of international



environmental law have still not been implemented, and the emergence of a general practice among common norms in environmental law, although intended for a short period of time, will not allow this capacity to be realized. It provides an environment for international law so that it can reflect the rules of customary international law and put them into practice by applying them in international practice. (Mousavi, 56:2015)

### **2-Mechanism of extraction, discovery and exploitation of lithium:**

It is believed that lithium is extracted from lithium mines, but in fact, more than 70 percent of the world's lithium is extracted from mineral-rich salt lakes. Methods of extracting lithium from salt lake brine mainly include ion exchange method, calcination washing method, membrane separation, nanofiltration method, solvent extraction method, etc.

### **3- Impact of lithium extraction on environmental law:**

Most articles point out that raw brine produced during the extraction of lithium mines in salt lakes can change the physicochemical properties of the soil and lead to soil salinization. Large-scale mining of salt lakes also aggravates the erosion of soil, water and soil in the area, and even changes the original topography and destroys the local landscape environment.

This is mainly reflected in the damage caused by road construction during the infrastructure construction period, the construction of salt farms and various buildings during the mining period, which cannot be repaired in the short term, and most of the lithium mining areas of the Salt Lake. The above-mentioned has a harsh climate but good ecology. Therefore, the ecological restoration of the mining area will also be difficult.

Although the mining method of spodumene is pit mining, which has little impact on the surface ecological environment, the exploitation requires a large amount of land, which seriously damages the local vegetation and may even change the composition and fertility of the soil. Large-scale land development is likely to cause disasters such as soil erosion and landslides.

### **4-Legal assessment of the performance of countries in the discovery, extraction and exploitation of lithium:**

Lithium is a soft, silvery-white alkali metal with an atomic number of 3. This element is the lightest metal and the least dense solid element under standard conditions of temperature and pressure. Due to the high reactivity of lithium, it can never be found as a free element in nature and is always found as part of a chemical compound that is mostly ionic. Since lithium dissolves in water, it is also found as an ion in ocean water and as a salt in water and clay. Lithium and its compounds have many applications, including in heat-resistant glass and ceramics, high-strength alloys used in spacecraft, lithium batteries for electric vehicles, and in medical uses as a medicine.

### **Conclusion**

The use of lithium in both industries and in pharmacy is a very important point to note; Because the line between the usefulness of this material and its toxicity to humans and the environment is very, very thin and fragile. Of the harmful effects and adverse effects of lithium on the environment, it can be said that lithium mining can affect fish up to 150 miles downstream. Whether the lithium industry will also pollute irrigation products is a question for environmentalists. The existence of the above problems also limits many countries to develop their own lithium batteries. From environmental considerations and technical process considerations, if there are insufficient process requirements, it will cause damage to the local environment caused by domestic lithium production. That is why many countries refuse to develop lithium mining in their countries. China is constantly raising the entry threshold of



lithium mining and dressing companies or increasing environmental protection inspection and supervision of lithium mining projects. Increasing ecological management of lithium mining areas, increasing investment in local environmental protection treatment facilities, etc. Only by using various tools to reduce environmental damage can the path of new energies be made longer and more extensive. Harvesting in this way may be very convenient, hassle-free, and inexpensive, but in the long run it has a huge impact on the ecosystem, and the death of many lakes and wetlands means the death of nature and the depopulation of the region involved in this process.