International Security Report

Chile's Lithium Market

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By
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THE GLOBAL POLICY HORIZONS LAB

Empowering Evidence-Based Solutions

For a Better World

Note from the Lead Author, Xine Straw

This International Security Report aims to provide a comprehensive analysis of lithium mining in Chile and its effects on indigenous communities, the Chilean nation, and the Chilean state.

We hope that this report will serve as a valuable resource for policymakers, scholars, practitioners, and all those interested in understanding and addressing the complexities of contemporary conflicts.

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About the Author

Xine Straw is a double major in International Relations and Languages and Transcultural Studies in Spanish at Webster University. She is focusing on the past effects of corporatism in Latin America and how, if left unchecked, it will affect the region in the present and future.

About the Global Policy Horizons Research Lab

Webster University's Global Policy Horizons Lab is a policy-focused research entity where students, Lab researchers, affiliated faculty, as well as members of the policy community from across disciplines, can explore national and global security issues, generate original research, as well as produce peer-reviewed policy papers and commentaries. The Lab pursues innovative research focusing on unconventional threats, identity and security, role of technology in security, economic security, as well environmental and food security. The goal of the Lab is to become a knowledge hub that informs national governments and other members of the global policy community on contemporary and future security challenges.

The current Director of the Lab is Professor Dani Belo, PhD.

Executive Summary

Lithium mining in the Andean Altiplano is paramount to the world's transition to green energy. Latin America, specifically what is considered the 'Lithium Triangle' holds over 60% of the world's land lithium, concentrated in brines underground[1]. Mining practices in the Lithium Triangle are imperative in their role in slowing worsening environmental conditions, but their current practices are doing unforeseen damage to the environment in the salares[2]. This environmental degradation, along with the harm done to the communities living in Chile's portion of the lithium triangle, is creating an unsustainable and toxic region, killing off important plants and animals in the ecosystem, and altering the geological structure of the region[3]. All this destruction is making for a path to greener energy that "ruin[s] one zone to satisfy another" (Quote from Francis Mandoca, Atacama Indigenous Council Leader)[4].

However, it is undeniable that lithium mining is playing a role in situating Chile in the global extraction market. By trying to develop more state control over lithium production, the Chilean state is gaining revenue and support in the market from the mineral[5]. These recent policy changes include passing new mining regulations that require companies to work more closely with the state-owned mining corporation Codelco[6]. This paper discusses the ramifications of allowing lithium mining to continue as it has been while also acknowledging the importance that lithium mining is playing in Chile's economy. It raises the question, do the benefits of lithium mining outweigh the costs?

Background

In recent years, demand for lithium has skyrocketed due to rising demand for electric vehicles and rechargeable batteries[7]. To fuel a transition to greener energy, the lithium market continues to gain traction and the mineral has become even more crucial to industry. Chile is the world's second greatest lithium producer and exporter[8]. This extraction of lithium, though lucrative in the market and imperative for the world's greener energy solution, is doing unexpected damage to the environment and the people living in lithium mining areas[9]. These areas, called salares or salt flats, are arid deserts; the Salar de Atacama being the largest salt flat in Chile. They are home to many different indigenous groups, with the Lickanantay (sometimes referred to as Atacameño) people the most prominent and most outspoken in the region, fighting against lithium mining externalities[10].

Lithium is mined from the salt flats in what is considered a "soft" mining practice because of its lack of invasive mining techniques like explosives[11]. The mineral is found in underground brines in the salares, which are pumped into open air evaporation pools and left for months and sometimes years to evaporate fully, with lithium as the final product[12]. This lithium mining, though seemingly harmless, destroys the environment and threatens the security of the indigenous groups living in the salares[13].

Primary Stakeholders

Actor	Impact	Effect
Government of Chile (Chilean State) 	Mixed	(-) The state has not created strong laws to hold mining companies accountable and has allowed mining practices to continue despite damages to the environment[14]. (+) In an attempt to regain some of the revenue generated by lithium mining, the state has increased its holding and involvement in lithium production without severing existing contracts with mining companies in order to keep business relations strong[15].
Lickanantay (sometimes referred to as Atacameño) Indigenous People	Mixed	(+) The lithium mines are in indigenous territory[16]. (+) They have consistently fought invasive practices in order to protect the environment and their way of life[17]. (-) Though their work via protesting and advocating for themselves and the salares at large, their stake in mining practices and policies remains small, as well as their influence[18].
Albemarle Corporation	Negative	(-) The company frequently ignores the demands of indigenous communities[19]. (-) Though claiming the revenue from mining will help indigenous communities, that revenue has not been seen in the economies of communities living in the salares[20]. (-) Due to lack of environmental regulations, mining practices have been damaging the ecosystems and geology of the salares[21].
Sociedad de Quimica y Minera (SQM)	Negative	(-) The company has been sued multiple times for union violations and human rights violations[22]. (-) The company does not often involve indigenous people in their production, citing 'skill gaps' to explain their hiring practices[23].

Actor	Impact	Effect
		(-) Due to lack of environmental regulations, the company continues to damage the salares[24].
Codelco	Mixed	(+) The state-owned mining company absorbs some of the revenue generated by mining corporations, ensuring that some revenue makes it back to the Chilean nation[25]. (-) Because of its strong stake in the competitive market, the mining company continues to promote lithium mining without much consideration for the externalities[26].

Secondary Stakeholders

Actor	Impact	Effect
United States	Mixed	(-) United States-based companies have invested heavily in SQM[27]. (+) As a large consumer of lithium, the United States continues to increase lithium demand with little regard for environmental degradation[28].
China	Mixed	(-) Chinese-based companies invest in both Albemarle and SQM[29]. (+) China consumes the largest amount of lithium in the world, thus creating the majority of demand for the mineral[30].

Risk Assessment Indicators

Extremely High Risk	High Risk	Medium Risk	Low Risk

Environmental Stress	Level: Extremely High Risk	Trend: Declining

Destabilizing Factors

Lithium as a Non-Renewable Resource: At the rate that lithium is being mined, the environment is unable to recharge lithium stores in the salares, thus categorizing this lithium as a non-renewable resource[31].

Geological Strain: Mining in the salares has caused the Salar de Atacama to being sinking at a rate of 1-2 centimeters a year, with the most drastic sinking happening in the areas with the most aggressive mining practices[32].

Leachates and Contaminates: Due to the waste production inherent in lithium mining, contaminates, such as lithium byproducts and lithium itself, have been leaching into the soil and groundwater[33].

Water Usage: The evaporation method of mining used to extract lithium, despite being considered a "soft" mining practice, uses copious amounts of freshwater from the already arid salares. This water usage is parching vegetation and wildlife in the salares and threatening the communities living on the salares with water scarcity[34].

Wildlife and Vegetation: Water usage by mining is causing vegetation and wildlife to die. The Andean flamingo population in the salares, which has been endangered since 2010, has decreased by 12% in recent years.[35] Due to vegetation loss, an increase in erosion is being seen, setting up the salares for a breakdown in future years[36].

Assessment

Because of the serious damage being done to the environment, both wildlife and vegetation are facing extinction[37]. The communities living in the salares, specifically the Atacameño people, are facing potential displacement for the sake of survival, with water scarcity and land contamination becoming increasingly more threatening to health and livelihood[38]. Though certain areas of the Salar de Atacama are under government protection, a significant portion of it remains open to lithium mining by the two licensed lithium mining companies, SQM and Albemarle[39]. Placing more of the Salar de Atacama under government protection could help alleviate the stress that the externalities put upon the people and environment in the salares.

Governance and Political Instability **Level: Medium Risk** **Trend: Declining** ↓

Destabilizing Factors

Lack of Government Environmental Regulation: The Chilean state does have some government-protected areas in the Salar de Atacama, but because the whole area is not protected, there are areas where mining is completely unregulated[40].

Conflict between Indigenous Leaders and Government: Protests against mining by indigenous communities have created friction between the Chilean government, mining companies, and the indigenous peoples[41].

Mining Corporations and Codelco: Because mining corporations mine lithium and formerly did not return much of the revenue generated from these practices to Chile, the Chilean government passed new regulations on the mining companies requiring them to sign new contracts that tighten partnerships between them and Codelco. However, to keep good relations with these companies, the Chilean state chose not to sever existing mining contracts, instead allowing them to expire before the new contracts would be put in place[42].

Assessment

Indigenous communities continue to protest the existence of mining in their region, making it difficult for the mining companies and the government to interact. Mining companies and Chile have, however, managed to develop agreements that will, in the future, allow for more income from mining to come into the country, which could create more funds to be used in supporting both the Chilean state and combating the externalities caused by lithium mining[43]. This could include environmental and natural disaster funding[44]. It is not guaranteed that this is how the revenue will be used, so lithium mining in the region seems now to remain profit-centered.

Economic Performance — Level: High Risk — Trend: Stable

Destabilizing Factors

Eco-Imperialism: Chile as a whole is losing both natural resources and land rights to mining companies as SQM and Albemarle, internationally backed companies that are linked tightly with the United States and China, mine without much regulation. This means that natural wealth is being stripped from Chile, while the Chilean population bears the brunt of the externalities from mining practices, bringing companies money and industry while weakening Chile's environment and economy[45]. Continuing to drain Chile of natural resources to fuel larger, more developed economies like the United States and China furthers a legacy of imperialism and exploitation of Chile and Latin American countries at large.

Resource Nationalism: In an attempt to combat eco-imperialism and regain some of the revenue generated by mining, the government of Chile recently put into effect new laws that would require mining contracts in the future to have a tighter connection with state-owned mining

company Codelco, while not severing current contracts, as well as making the Chilean state a primary stock holder in mining contracts[46].

Threat to Tourism: With the loss of water in the salares, tourism is declining due to unsustainability. This leaves the people of the salares without means to support themselves economically. The revenue earned from salt sales and other tourist attractions is imperative to indigenous community support, but the contamination of the salt by mining leaching contaminates into the area has been decreasing this income[47].

Threat to Geotourism: Much of the revenue supporting indigenous communities on the salares comes from geotourism, the tourism that happens as a result of the geological attributes of an area. With mining detracting from the overall appearance of the salares, fewer tourists are traveling to the areas, leaving populations with depleted income that is not being replenished by mining revenue[48].

Assessment

Without revenue from tourism in the salares and with the environmental stress threatening self-sustained support practices like farming and livestock cultivation, the likelihood of displacing the indigenous communities in the salares increases significantly. The economic stress caused by the loss of tourism could be alleviated by mining revenue being returned to the communities of the salares, but so far, that has yet to be seen, despite promises made by mining companies[49]. Additionally, much of the revenue from mining does not make its way into the Chilean state as a whole, though new laws are working to combat this loss of revenue and natural resources.

Human Development **Level: High Risk** **Trend: Declining** ↓

Destabilizing Factors

Water Injustices: Water usage in the lithium triangle is being skewed by lithium mining, with mining companies consuming massive amounts of water, leaving the indigenous communities in the most arid desert in the world with very little fresh, uncontaminated water[50].

Loss of Cultural Practices: Due to lithium mining's extensive use of water, indigenous populations are losing the ability to support their livestock and agricultural cultivation practices. The loss of cultural practices in Latin American indigenous communities is shown to cause "more depressive symptomatology, more health problems, and lower consumption of medication"[51]. Protecting indigenous cultural medical practices has been shown to improve mental health as well as general health.

Assessment

Lithium extraction threatens an already historically threatened population. To quote Atacama Indigenous Council leader Francis Mandoca, lithium mining "ruin[s] one zone to satisfy another."[52] This ruining of indigenous populations' zones threatens the extinction of indigenous cultural practices entirely. Losing indigenous medicine and culture will do even more harm to those living in the salares[53]. Threatening entire cultures like this will likely drive them out and displace them.

Population Heterogeneity **Level: Medium Risk** **Trend: Stable** 

Ethnic Diversity: The population of Chile is primarily mestizo, with white and indigenous groups in smaller minorities. The population of the salares is mainly indigenous, with the Lickanantay people the most prominent community in the Salar de Atacama[54]. This community is threatened with loss of culture and, in turn, loss of health by lithium mining[55].

Destabilizing Factors

Plurinationalism: Because indigenous groups in the salares are considered plurinational, meaning they are of multiple nations, there is more difficulty in determining their position in Chile's government and therefore their rights as citizens[56].

Assessment

The Chilean people are predominantly not indigenous, and their interests frequently outweigh the interests of the indigenous groups. With the indigenous peoples' stake in the salares, this complicated relationship becomes more strained, with the government and people of Chile looking to benefit from mining while the indigenous people hope to protect the salares. Due to the conflicting interests within the country, policy making is difficult, and not all needs are met on both the national and international stage.

International Linkages **Level: Medium Risk** **Trend: Declining** 

Destabilizing Factors

Mining Companies as Allies: Because of the revenue generated by mining companies, the Chilean state cannot risk the loss of their presence in the region. Though recently changing laws to gain a greater amount of the mining profits from corporations, mining companies are still not heavily regulated by the Chilean state[57].

Global North Countries as Allies: Fossil fuel-consuming countries that are converting to green energy are major buyers of lithium batteries. This means that the Chilean state, to keep a good relationship with these crucial countries, does not put much pressure on the companies to bear and lessen the externalities created by aggressive mining practices[58].

Assessment

The Chilean state is in a complicated position because it needs to keep good relations with lithium-consuming countries and gain revenue from lithium being mined in the salares. Thus, the rights of indigenous peoples and care for the environment of the salares lose focus in the wake of the rights and revenue of the mining companies. Without a clear, collective goal in mind that serves all involved parties, the Chilean state is faced with a difficult question: are the environmental and community impacts of lithium mining more threatening than the profits gained from lithium are imperative?

Possible Scenarios for the Next Year

Best Case Scenario

New mining laws would be put into place by the Chilean state, cutting back the aggressiveness of mining practices, requiring more control over water usage, and demanding more revenue be returned to the salares. This would be done by requiring the companies to find alternative sources of water to the freshwater in the salares and incentivizing the companies to hire indigenous people in the region. Additionally, the corporations would sign with state-owned mining company Codelco to allow more of the profits from lithium to reach the Chilean people. Though this would not protect the environment in the short term, giving more control and more involvement to the Lickanantay people in the salares would allow for future defenses of the environment to be developed over the coming years.

Worst Case Scenario

As the lithium market continues to become more aggressive, so will mining practices. Without any regard for the environment and the people of the salares, mining practices would continue, with little revenue making its way into the state and the communities, as things are right now. An increase in mining would continue environmental destruction, with flora and fauna populations being further degraded and the Salar de Atacama continuing to sink. Additionally, indigenous groups would be pushed out of the land due to environmental damage and lack of water. This would cause them to lose their ties to the land and their cultural practices. No new regulations would be put into place to stop this damage, and the populations that are demanding recognition

would be ignored. This increase in aggressive mining and lack of care for indigenous wishes would effectively destroy the Salar de Atacama permanently.

Most Likely Scenario

With the new laws and mining contracts put into place by the Chilean state, mining profits entering the country's economy would continue to increase, thus supporting measures to help the environment. Though not able to fully halt the aggressiveness of mining practices, the protests and combatting of mining companies by the indigenous peoples in the salares would be able to reach more agreements to return more of the profits to the area, lessen water usage, and help the world transition to green energy without being forced to leave the salares and lose their culture.

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