

Energy transition and lithium extraction in Argentina: challenges, impacts and disputes at stake

Friends of the Earth, Japan

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Context and tensions around the Energy Transition

- **Climate, biodiversity, pollution crises.**
- **Energy transition. How, for whom, in what way? Geopolitical race.**
- **Minerals demanded.**



IEA: lithium demand for battery production **increase up to 42 times** by 2040 compared to 2020

IADB: **lithium demand will be 1036% higher than 2020 levels.**

Tensions around the Energy Transition

- **Estimates on lithium demand are not clear and focus mainly on individual mobility.**
- **Hyper-consumption paradigm is maintained. There is no call for the reduction of environmental goods**



Massive acceleration of production and processing in a short period of time



Degradation of key ecosystems for adaptation and mitigation.

Tensions around the Energy Transition

- **Right breaches.**

More than half of the minerals considered “critical” are on or near indigenous lands. No compliance with FPIC.

- **Geopolitical structures constrain countries to serve as mineral suppliers, limiting their capacity to shape autonomous energy transitions.**

- **Consequences in Argentina at the National and local level.**

Where is lithium?

**ARGENTINA + BOLIVIA + CHILE =
+53% global brine lithium reserves
in their ANDEAN WETLANDS**

Status of Mining Projects



Lithium Projects

- PRODUCTION**
- 1 - Cauchari-Olaroz
 - 2 - Centenario-Ratones
 - 3 - Fénix
 - 4 - Mariana
 - 5 - Olaroz
 - 6 - Sal de Oro
- CONSTRUCTION**
- 7 - Hombre Muerto Oeste
 - 8 - Rincón
 - 9 - Sal De Los Angeles
 - 10 - Sal De Vida
 - 11 - Tres Quebradas
- FEASIBILITY**
- 12 - Kachi
 - 13 - Pastos Grandes
 - 14 - Pozuelos (PPG)
 - 15 - Salar Del Rincón
- PREFEASIBILITY**
- 16 - Arizaro
 - 17 - Cauchari
 - 18 - Cauchari Jv
- PEA**
- 19 - Candelas
 - 20 - Hombre Muerto Norte
 - 21 - Salar Tollillar
- ADVANCED EXPLORATION**
- 22 - Alba X
 - 23 - Alcalina
 - 24 - Arizaro
 - 25 - Arizaro Norte
 - 26 - Cangrejillos
 - 27 - Centenario
 - 28 - Doncellas
 - 29 - Gallego
 - 30 - Incahuasi
 - 31 - Incahuasi Moncho
 - 32 - Laguna Verde (La Borita)
 - 33 - Mina Sisifo - Mina Patilla
 - 34 - Pocitos I
 - 35 - Pular (Salta Lithium)
 - 36 - Reina Sofia Iv
 - 37 - Rincón Oeste
 - 38 - Río Grande
 - 39 - Río Grande Sur
 - 40 - Sal De La Puna
 - 41 - Salar De Arizaro
 - 42 - Salari
 - 43 - Salari 22
 - 44 - Sincera
 - 45 - Solaroz
 - 46 - Taca Sal Iv
 - 47 - Vega De Arizaro
- INITIAL EXPLORATION**
- 48 - Antofalla Norte
 - 49 - Candela II
 - 50 - Cazadero Grande
 - 51 - Incahuasi
 - 52 - Los Sapos
 - 53 - Río Grande
 - 54 - Salar De Antofalla I Al Xiii
 - 55 - Y Bolland Vi
- PROSPECTING**
- 56 - Cateos
 - 57 - Hombre Muerto Sur
 - 58 - Karachi Salar Escondido
 - 59 - Lipetren
 - 60 - Litio Gold I, II Y Iii
 - 61 - Virgen Del Valle Litio

- Argentina: around 60 lithium projects in different stages.

Production - 6

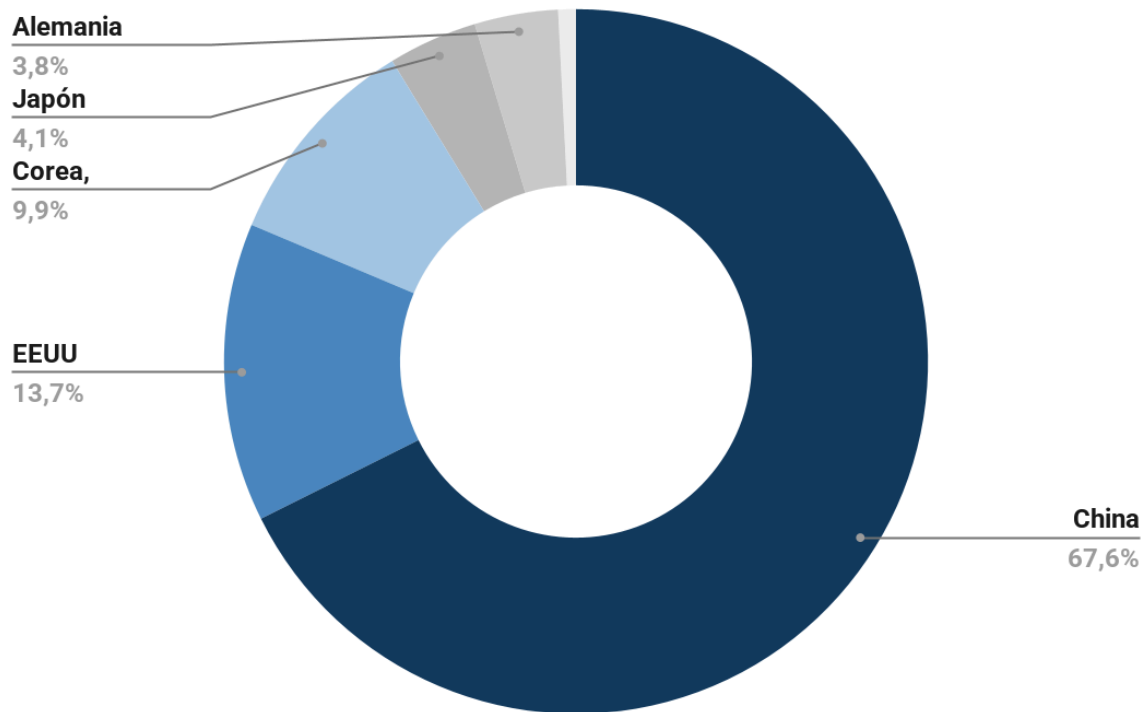
- Cauchari- Olaroz (Jujuy)
- Centenario – Ratones (Salta)
- Fénix (Catamarca)
- Mariana (Salta)
- Olaroz (Jujuy)
- Sal de Oro (Catamarca)

Construction - 5

Feasibility - 4

Advanced Exploration - 26

MAIN LITHIUM EXPORT DESTINATIONS 2024 (Argentina)



Andean Wetlands in Argentina



Examples of different types of high Andean wetlands. **Fig. 1** A-Lagoon – B –Salt flat, C- Bofedal, D- Vega. YUCHAN Foundation y Dr. Frau, D., 2022

Context – Andean wetlands affected by lithium mining in Argentina

- **High biological, cultural, economic, environmental and social value.**
- **WATER determines life.**
- **Region of great aridity. Scarce rainfall. High evaporation rates.**
- **Low water availability. Mainly subway sources.**
- **Territories inhabited by indigenous communities.**
- **Increasing threats. Climate change. Anthropic actions (lithium mining).**









Contributions of Andean wetlands

Material - Support	Non-material	Environmental regulation
<ul style="list-style-type: none">➤ Fresh water supply➤ Energy➤ Food and feed➤ Medicinal, biochemical and genetic resources➤ Others	<ul style="list-style-type: none">➤ Learning and inspiration➤ Physical and psychological experiences (Tourism, very few systematized and quantitative studies of visits).➤ Identity support. Ways of life. Indigenous worldview. “(Sumak Kawsay)”.	<ul style="list-style-type: none">✓ Creation and maintenance of habitats<ul style="list-style-type: none">✓ Climate regulation✓ Carbon stocks✓ Regulation of water quantity, quality and distribution✓ Formation, protection and decontamination of soils and sediments<ul style="list-style-type: none">✓ Others

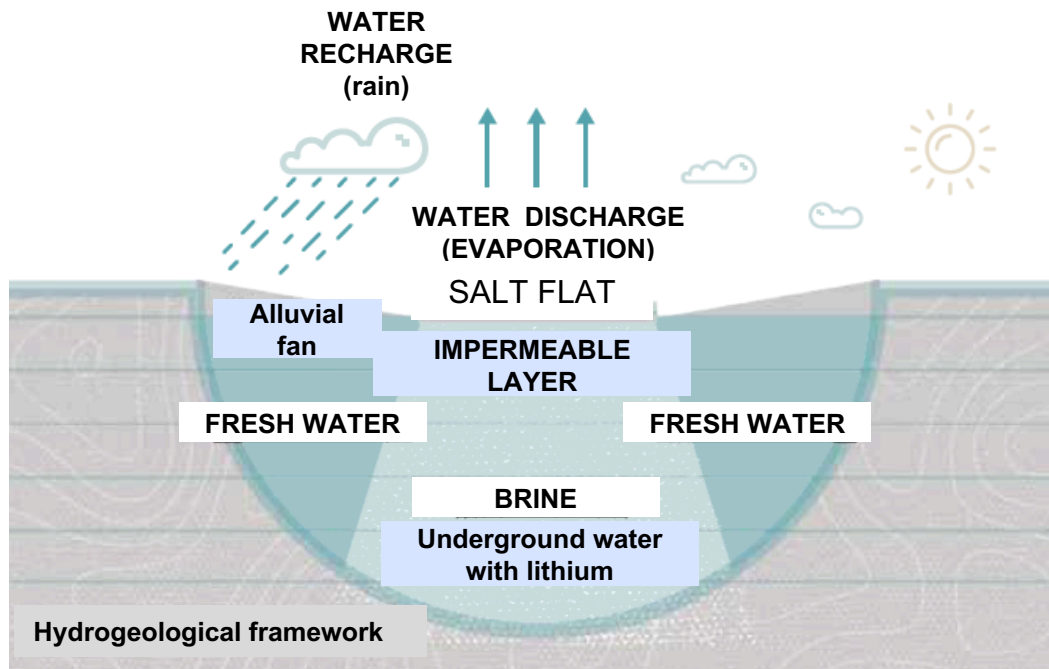


Credit: Produced by Environment and Natural Resources Foundation. Illustrative and non-exhaustive image of activities and communities in the SGyLG watershed.

-  Producción agrícola a pequeña escala
-  Ganadería
-  Turismo
-  Artesanías
-  Hospedajes y comedores familiares
-  Viñedos



Potential impacts of lithium mining



Produced by FARN based on Sticco, 2018.

- **Water “mega-mining”.**
- **Salinization; risk of subsidence; water imbalances**
- **Deficit in implementation of assessment and planning tools**
- **Information gaps**
- **Lack of or non-compliance with access rights and FPIC**

Understanding the Lithium Brine Extraction Process



Credit: HIGH ANDEAN WETLANDS | What are the damages caused by lithium mining?. FARN.

General impacts of climate change

- Increase in evaporation rates
 - Reduction of habitats
- Potential changes in water quality
 - Reduction in water availability
 - Alteration of ecosystem processes
- Increase in erosion and land displacement
 - Salinization
- Reduction of vegetation cover area
 - Increase in carbon emissions
 - Other unanticipated effects

Impacts on Andean Wetlands

- Anthropogenic disturbances + climate change impacts may contribute to the degradation of high Andean wetlands and lead to:
- A reduction or loss of the ability of high Andean wetlands to capture carbon dioxide
 - A reduction or loss of their carbon storage capacity
- The release of greenhouse gases into the atmosphere (mainly carbon dioxide and methane).

In this scenario, high Andean wetlands could shift from functioning as carbon sinks and reservoirs to becoming sources of greenhouse gas emissions.

Impacts on biodiversity

- Existing evidence suggests that the capacity of biodiversity in terms of adaptation and resilience to climate change may be low or require human intervention (although this is highly variable and specific studies are required).
- These impacts may have an incremental effect in the altiplano region, where biodiversity is already adapted to extreme environmental conditions and in many cases is highly dependent on water balance.
- No specific studies have been identified for the altiplano region of Argentina.
- Additional stressors such as lithium mining could contribute to exacerbate the negative impacts of water availability.

Challenges around lithium mining regulation in Argentina

- Regulatory tensions for lithium mining decisions in Andean wetlands
 - Lack of key regulatory frameworks
 - Lack of baselines to assess impacts of mining projects
 - Cumulative and synergistic impacts not assessed
- Biased and exclusionary production of knowledge. Hydrogeological models prioritize technocratic, reductionist views of water as a quantifiable "resource," overlooking its cultural, social, and ecological dimensions while silencing local knowledge and alternative ways of relating to the territory.

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- Biased and exclusionary production of knowledge.
- Hydrogeological models prioritize technocratic, reductionist views of water as a quantifiable "resource," overlooking its cultural, social, and ecological dimensions while silencing local knowledge and alternative ways of relating to the territory.
- Environmental and human rights violations. Non-compliance with FPIC. Non-compliance with access rights. Harassment and criminalization of environmental defenders.

Opportunities

- **Reduction of demand of environmental goods**
- **Projected demand of minerals should include planetary boundaries**
- **Enhance multilateral cooperation and ensure that Southern countries' views are reflected**
- **Minimize adverse impacts on the Global South and ensure holistic socioecological transitions that respond to the socioeconomic and environmental needs of each country, based on democratic participation, with genuine mechanisms for citizen participation and consultation with indigenous peoples.**
- **Financial flows to minerals and transition technologies**
- **Compliance with human right and environmental regulations**

Thank you

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