Sustainable for whom? Brazilian Lithium: The Promise of Energy Transition and Socio-environmental Unsustainability

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Lithium mining is part of a complex discussion about the energy transition in the fight against climate change. The ore, often called the "white gold" of the energy transition, is a key resource in the production of batteries used in a wide range of devices, from mobile phones to electric vehicles. Brazil is emerging as a major player in the global lithium mining scene. In recent years, the country has witnessed rapid growth in lithium production and exploitation, while at the same time causing socio-environmental impacts on the population.

In the Jequitinhonha Valley (MG) there are a total of 558 active lithium mining processes, which represents 18% of the region's territory.

On 6 July 2023, Decree 11.120/2022 was published in the Federal Official Gazette (DOU, abbreviation in Portuguese)[1], allowing foreign trade operations in lithium minerals and ores and their derivatives. The measure promotes the opening and dynamisation of the Brazilian lithium market, with the aim of positioning Brazil competitively in the global chain, according to the Ministry of Mines and Energy.

Construction of Sigma Mineração's lithium concentrate production and processing plant. Source: Publicity / Sigma.

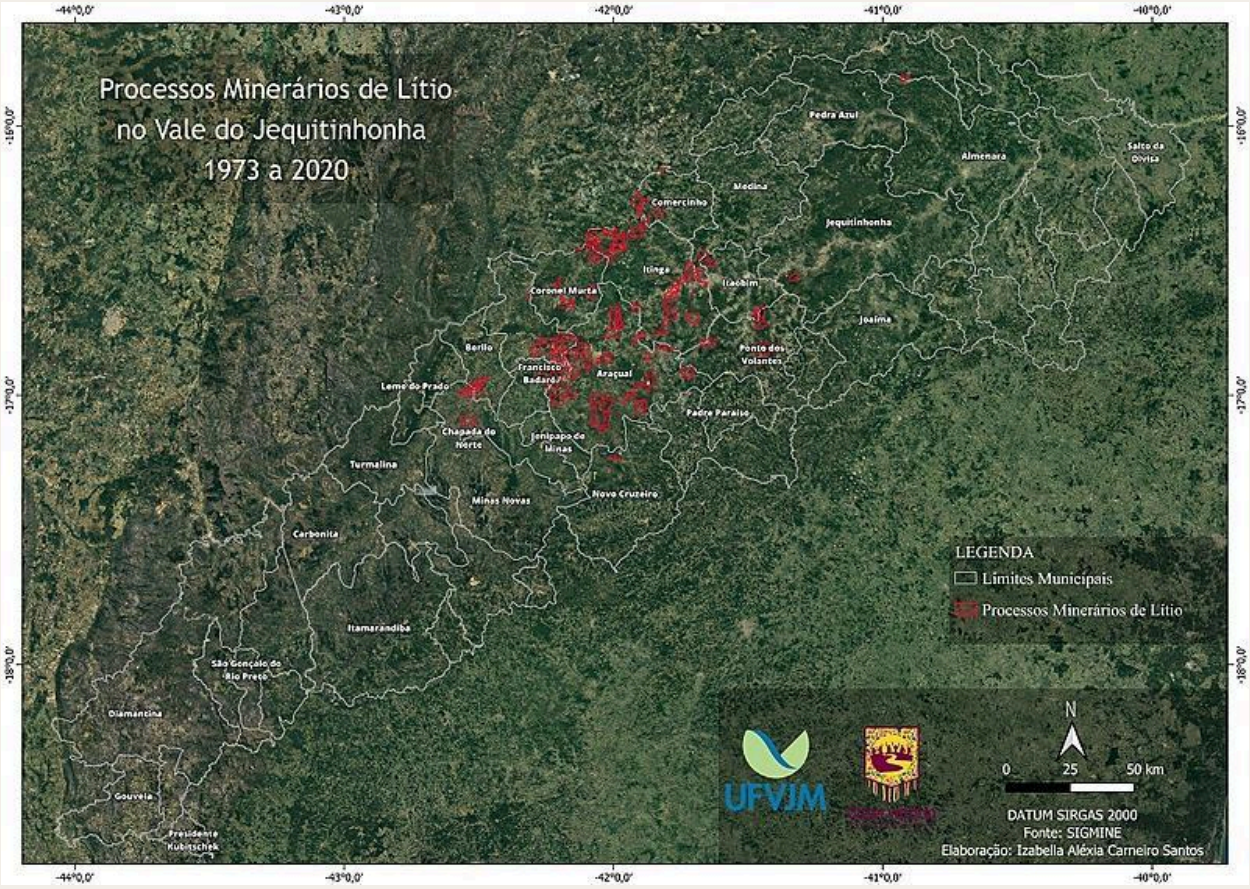
Minas Gerais: A Lithium Giant

Lithium is mainly concentrated in the Jequitinhonha Valley region in the state of Minas Gerais, in south-eastern Brazil. Between 2021 and 2023, the Jequitinhonha Valley experienced remarkable growth in lithium production, jumping from 11th place to third in terms of turnover in the country, behind

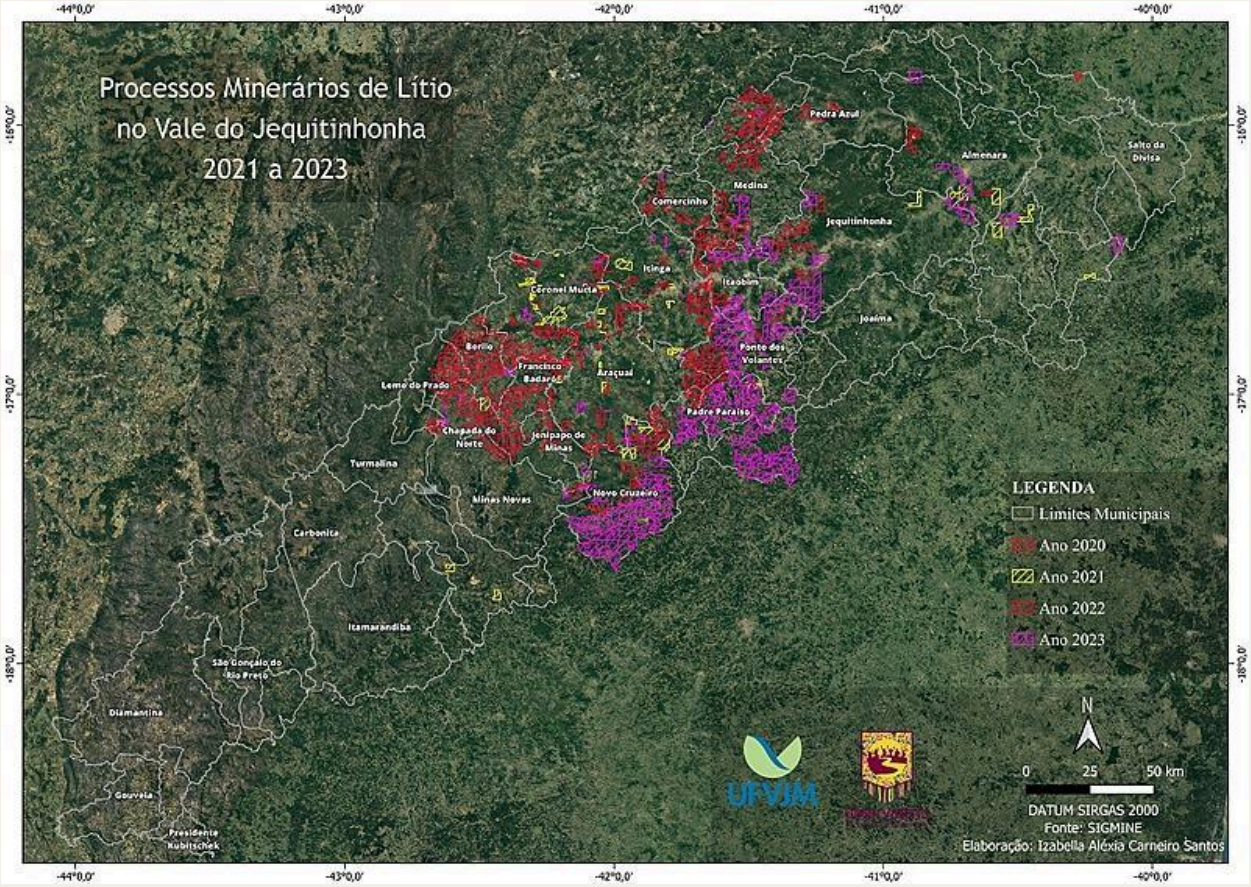
[1] The DOU is the official gazette of the Brazilian federal government.

only iron and gold, lithium production in the state grew exponentially, reaching a turnover of R$1.44 billion between January and July 2023.

According to analyses carried out by the Research Project "Mining Processes, Agrarian Situation and Conflicts in Jequitinhonha" at the Federal University of the Jequitinhonha and Mucuri Valleys, there are a total of 558 active lithium mining processes in the Jequitinhonha geographical mesoregion. Of these, most are at the research application, research authorisation, and mining application stages. These processes occupy a total area of 658,471.33 ha, which represents 18% of the territory of the Jequitinhonha Valley.



Map of mining models, in red, in the Jequitinhonha Valley from 1973 to 2020. Source: Original article.



Map of mining models in the Jequitinhonha Valley from 2021 to 2023. Source: Original article.

Lithium extraction requires large amounts of water, and the Jequitinhonha Valley is known for facing water scarcity problems. Responsible water management is essential to ensure that lithium mining does not exacerbate the water situation in the region. Each tonne of lithium requires around two million litres of water, which puts a strain on already fragile local ecosystems and challenges the availability of water for communities in the region.

Bruno Milanez, a professor in the Postgraduate Geography programme at the Federal University of Juiz de Fora, where he works in the area of Environmental Policy, with an emphasis on assessing the impacts of the mining-metallurgical chain, socio-environmental conflicts, and environmental capacity, explains that the company Sigma Lithium, which operates in the Jequitinhonha Valley, seeks to position itself as a green mining company, however, experts raise the question of the extent to which mining operations can be truly sustainable,

considering the high environmental impacts, water consumption and generation of toxic waste associated with this activity.

Currently, the main technique for extracting carbonate and lithium chloride is by evaporating brines. The process begins by drilling through the crust and then pumping the brine up to the surface into evaporation pools, where it is left for months. This creates a salty sludge made up of a mixture of manganese, potassium, borax, and lithium salts, which are then moved to another evaporation pool in the open air. In other words, the extraction of lithium creates gigantic radioactive pools, the risks of which cannot yet be accounted for, although they are foreseeable: contamination of the air, surface water, and groundwater, and consequently of the entire environment.

In addition to environmental impacts, lithium mining also raises social issues. Lithium mining often takes place on land occupied by local communities, including indigenous communities. The lack of prior consultation with these communities, as stipulated by the United Nations Declaration on the Rights of Indigenous Peoples and Convention 169 of the International Labour Organisation, violates fundamental rights.

“Selling the idea of lithium as strategic hinders the resistance movement, because it can seem like people are going to have to sacrifice to save the world, when in fact it's not going to save the world,” explains Milanez. Mining activities can result in the displacement of communities, the destruction of agricultural land, and impacts on local culture. Promises of economic development don't always translate into tangible benefits for local populations.

For Professor Cláudio Scliar, a specialist in Geosciences and professor at the Federal University of Minas Gerais (UFMG), the yardstick for measuring the sustainability of mining should be different: "The yardstick that should be used to measure sustainability in mining is the quality of life of the community workers in the territories and the contribution to fair sustainable development for the sovereignty of the country," points out Scliar.

In search of the "white gold" of the New World

Latin America concentrates around 60 per cent of the world's reserves of this mineral in the "lithium triangle", which is considered essential for the production of batteries that promise to replace the use of fossil fuels, the burning of which is responsible for a large part of the carbon emissions in the atmosphere. However, little is said about the impacts that will be caused by the lithium industry.

The coup that overthrew Evo Morales from the presidency of Bolivia in 2019 had as one of its main motives the dispute over lithium, a strategic mineral for the energy transition. Bolivia is the country with the largest lithium reserves in the world, estimated at 21 million tonnes, which represents 50% of the world's reserves. Lithium is an essential component for the production of lithium batteries, which are used in electric vehicles, smartphones, notebooks, and other electronic devices.

The progressive Morales government favoured a policy of exploiting lithium under state control, with the aim of generating benefits for the Bolivian people. This stance ran counter to the interests of multinational companies, which wanted to exploit Bolivian lithium on their own terms.

In the context of the energy transition, lithium has become an increasingly valuable resource. With the growing demand for electric vehicles, multinational companies have stepped up pressure to control Bolivia's lithium reserves. The 2019 coup was a coup d'état backed by the United States and the Bolivian right. The coup plotters, led by Luis Fernando Camacho, promised to revoke the policy of exploiting lithium under state control, which did not happen.

Milanez points out that although Brazil has the potential to become an important player in the lithium industry, it is essential that the country addresses these issues in a strategic and sustainable manner. This implies an open dialogue with local communities, the implementation of responsible mining practices, and consideration of how lithium can contribute to the energy transition and national development. The researcher says that the country seems to lack a national debate on the nationalisation of lithium while neighbouring countries like Bolivia and Chile are already discussing the

importance of ensuring that the benefits of this mineral wealth return to their populations.

“Brazil simply doesn't have this discussion about how to guarantee that this lithium will eventually be used in some way to benefit the country, other than simply to export it,” says the researcher. Lithium mining in South America is a striking example of the complexities facing the Global South as it plays a vital role in the transition to a more sustainable future. The search for “white gold” must be conducted responsibly, maintaining a balance between economic progress, environmental preservation, and respect for the rights of local communities.

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