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The race for lithium, a battery essential, albeit with high social and environmental costs

7 Maggio 2021

There’s more to “Green revolution” than most people realize. Sustainability and ecological transition are understandably high on the political agenda, including that of President Biden and PM Draghi's Recovery Plan. Yet shortcuts should be treated with caution. Equating sustainability with electric vehicles, for example, is far too simple and convenient, with its growing production and attractiveness, supported by incentives. South America , where “Green” is not equivalent to environmental protection, sounded the alarm. In fact, an intense shade of green, more intense than emerald, stands out against reddish desert stones and white salt deposits. It can be easily viewed with satellite imagery on a computer screen, zooming in over northern Chile, neighbouring Bolivia and, further east, northwestern Argentina. The intense green areas correspond to the reserve bases of lithium, a metal that powers today's electric cars and batteries.

The race to secure what is likely to become the most coveted raw material in the coming years has been ongoing for several years. And it is creating more problems than opportunities for local economies.

It is estimated that Bolivia, Chile and Argentina together hold over 50 percent of (some say up to 80 per cent) of the world's lithium reserves. This "triangle" is characterised by unique territories: desert plateaus, in some cases at an altitude of 4,000 metres, almost completely arid, and often surrounded by huge salt flats (Salar de Uyuni in Bolivia, the world's largest salt flat, is as large as the Abruzzo region in Italy.) **Environmentally invasive technique.** Our journey starts from Chile, which has the largest lithium reserves worldwide, second only to Australia (where the lithium is mined from hard rock mineral sources and not extracted via evaporation processes). "The question is not to renounce the extraction of existing resources altogether otherwise we wouldn’t be speaking on our mobiles right now," **Cristina Dorador**, Professor of Microbiology at the University of Antofagasta, told SIR.

The issue involves sustainable production, which requires a change in lifestyles.

Certainly none of us need three electric cars or five smartphones....” In any event, lithium extraction via evaporation is an invasive process that has an impact on unique and extremely

vulnerable ecosystems. As the professor explains, “'The Atacama Salt Flat is the largest basin, where two companies operate: SQM Salar, with Chilean capital, and Albemarle, a corporation with international investors. The technique entails drilling into salt flats and pumping salty lithium brine water to the surface, where the lithium is collected via evaporation. It's a months-long process, during which the surface turns green.” At first glance, it would seem to be a less invasive technique compared to other well-known mining processes across the continent. But that's not the case. “The water that evaporates," Professor Dorador explains, "has been here for millions of years. The impact on vegetation, soil temperature, aridity and biodiversity is already felt in the Salar de Atacama. Small indigenous communities risk running out of water.” In short, we are dealing with

"serious environmental and social impact",

In a country like Chile, this is compounded by a liberal economic model that fails to recognise important resources such as water as 'common goods'. This is one of the reasons why Professor Dorador has applied as an independent candidate to serve in the Constituent Assembly tasked with drafting a new constitution for Chile, one of the world countries most affected by climate change. **The same old reasoning.** Moving across the Andes, Professor **Natalia Sentinelli,** environmental expert for the Be.Pe association and co-author of a report on lithium, travels extensively throughout the Catamarca province on a daily basis, campaigning against the many mining plants with a negative impact on the natural environment of the area. "What's worse is that,

from a geopolitical perspective, everyone is talking about sustainability, but ultimately it all boils down to the same old rationale: natural resource extraction.

For example, apart from lithium, most people are not aware that an electric vehicle contains seven times more copper than a normal car. So obviously these are not environmentally sustainable solutions." As regards lithium, its extraction “disrupts the water cycle, affecting extremely delicate ecosystems, impacting aquifers, the subsurface water flow running between the mountain ranges and the sea.” Furthermore, "beneath the salt flats there are underground reservoirs of fresh water. Drillings for lithium extraction reach a depth of up to 300 metres causing fresh and salt water basins to mix, seriously damaging the ecosystem.” For the researcher,

alongside the 'geopolitics of extractive mining' and environmental impact, two other questions

should be addressed: the impact on society and human rights, especially the lack of information and consultation among the local population, and the challenge of local lithium industrialisation.

As regards the first point, "We are a long way from being able to industrialise lithium in Argentina," said Professor Sentinelli, emphasising an age-old problem of the Continent concerning raw materials. **Not good business in Bolivia so far. Francesco Zaratti,** Italian physics professor at the University of La Paz, who has been living in Bolivia for many years, is equally convinced that lithium is no "good business" for South American countries, with the partial exception of Chile. Many people think that the Andean country has the world's richest lithium reserves beneath the Uyuni salt flat. In fact, years ago, former President Evo Morales announced plans to exploit this resource. "But up to now, lithium has given Bolivia more problems than benefits," said the professor, who however is not opposed to the possible exploitation of this mineral: "No one knows how much lithium lies beneath the salt flats - it is found at a depth of six metres - and yet it is such a vast area that lithium extraction could coexist with other activities, such as tourism." Indeed, the problem in Bolivia is the opposite of Chile:

"Here there is a myth of nationalisation. However, if the sector is in the hands of incompetent people, as has been the case here, with poor technological skills, there won't be much progress. It's not exactly a crime to entrust responsibility to experts." Ignorance and amateurism are compounded by technical problems in Bolivia: "Here we get more rain than in the Atacama Desert, and the water basins also contain magnesium. This mineral has to be separated from lithium, which complicates the process." On top of that, royalties for companies are much lower compared to natural gas. The latter offers profit margins of up to 70 per cent, while lithium yields no more than 5-10 per cent." *(*) journalist, “La difesa del popolo”*

Bruno Desidera (*)