



Lithium extractivism and water injustices in the Salar de Atacama, Chile: The colonial shadow of green electromobility

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ABSTRACT

This paper analyzes the linkages and feedback between green electromobility, lithium extractivism, and water injustices affecting the Atacameño's indigenous communities in the Salar de Atacama basin (Atacama Salt Flats). Currently, lithium is in high demand in the international markets as a strategic resource for the green electromobility industry, which represents part of the Global North policies established by the Paris Agreement to mitigate climate change's effects. Using both documentary and ethnographic methods based mainly on semi-structured interviews conducted with Atacameño people, public officials, and lithium companies' representatives and workers, we propose a decolonial interpretation of lithium extractivism in brine mining through the lens of Latin American political ecology combined with a decolonial and water justice approach. The results demonstrate how the linkages and feedback between global and local dynamics of lithium mining in the Salar de Atacama constitute a form of green extractivism that further replicates the historical inequalities between the Northern and Southern hemispheres and especially affects the indigenous Andean territories and the water ecosystems in the Global South. We call this phenomenon the colonial shadow of green electromobility. We conclude by exposing the need to rethink global proposals addressing climate change by reducing the commodity demand and aiming for water justice at global and local levels.

1. Introduction

In the last decade, the demand for lithium and its international price have experienced a significant rise since it became a strategic mineral for the electromobility industry. In particular, it is the main raw material used for manufacturing rechargeable lithium-ion batteries, as lithium has privileged properties for this use (COCHILCO, 2017).

Green electromobility is part of the global technology industry that has experienced a sizeable increase in the last decade as part of the new green policies in the Global North. These policies promote green energy transitions based on renewable energy, improving the positioning of electromobility systems, and low-carbon renewable energy production. Basically, they respond to the international community's current commitments established in the Paris Agreements, which aim to mitigate climate change's effects. The implementation of these policies is frequently accompanied by updated rhetoric of green capitalism based on proposals for sustainable development derived from green economy concepts. This economy is based on the continuous oversupply of raw

materials and commodities, a result of the high commodity demand for the development of technology markets and zero-carbon lifestyles of the Global North (Gobel, 2013; Kothari et al., 2019).

The green policies have generated an international lithium fever that has exerted pressure to increase the extraction of this mineral, located mainly in territories historically inhabited by indigenous and rural communities in the Global South. One of the main extraction sources is in the Salar de Atacama (Chile), immersed in the Atacama Desert (the driest in the world), an indigenous ancestral territory of the *Lickanantay* ethnic group (*Atacameños*). There, lithium exploitation has been contributing to producing socio-environmental pressures through water overexploitation in hydro-social territories (cf. Boelens et al., 2018), which, in turn, has been generating growing ethno-cultural fractures in the local communities.

This article investigates the linkages and feedback between green electromobility and lithium extractivism and its impacts on hydro-social processes in the Salar de Atacama basin. What are the water injustices associated with lithium extractivism? How are they related to the green

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electromobility policies? To answer these questions, we present this new socio-ecological configuration from Latin American political ecology with a decolonial and water justice approach (Alimonda, 2011; Boelens et al., 2018). Our argument is that the expansion of lithium demand coming from the Global North has been generating socio-environmental damages and water injustices in the Global South due to the transformation of local hydro-social processes. With this, it has affected both the ecosystems and communities of native people. We point out that these local damages constitute the colonial shadow of green electromobility. Our evidence is based on documentary and ethnographic research carried out between 2016 and 2018 in the Salar de Atacama basin. We propose a decolonial interpretation of lithium mining extractivism, emphasizing the North-South structural inequalities that are reproduced again and that constitute what we call the colonial shadow of green electromobility. From there, we rethink the global proposals to face climate change and global warming beyond green electromobility, as our evidence shows that generates water injustices in the Salar de Atacama.

The article is structured as follows. In the next section, we elaborate on a conceptual framework based on Latin American political ecology from a decolonial perspective, which emphasizes the water injustices generated by lithium extractivism. In the following section, we describe the methodology used based on ethnography and secondary data. Then, we discuss the results and impact of green electromobility policies on lithium extractivism and its implications on water justice in the Salar de Atacama. The results indicate that an increase in lithium extractivism contributes to aggravating the water predation of the Salar and generates growing ethno-cultural fractures in indigenous communities. We conclude that electromobility, promoted by the new green economy and its CO₂ reduction policies in the Global North, creates a colonial shadow in the indigenous hydro-social territories of the Global South.

2. Decolonial political ecology, Lithium's green extractivism, and water justice struggles in the global South

2.1. The coloniality of nature and lithium's green economy

As a fundamental historical-structural dimension that constitutes the hidden reverse side of modernity and as a foundational element of world capitalist power, coloniality is an aspect of vital importance in understanding both socio-environmental processes and political ecology in Latin America (Gudynas, 2015; Quijano, 2014). This concept has been widely discussed and developed in the field of decoloniality/modernity studies (Parra-Romero, 2016). Since the Iberian conquest, Latin America has been subordinated within the world system as a zone that supplies raw materials. This subordination establishes as a starting point of Latin American political ecology "the catastrophic trauma of conquest and integration in a subordinate, colonial position in the international system, as a necessary and hidden reverse of modernity" (Alimonda, 2011, p. 21). From this perspective, Latin American political ecology interrogates coloniality as a constantly reproducing historical-structural process in which socio-environmental conflicts and disputed territorialities proliferate. Here, communities not only claim rights to access and control certain natural assets (Gudynas, 2015) but also claim the impacts caused by the imposition of ecologically unsuitable appropriation models that are strange to the local people. We are faced with conflicts between dominant and alternative modes of nature appropriation (Leff, 2017). In this paper, we argue that lithium mining constitutes a new imposition of extractive territoriality that reproduces colonial stratifications in the high Andean salt flats of the Southern Cone.

In the 21st century, the coloniality of nature is also reproduced through those ecologically correct political orientations that imperial centers adopt and that continue to constitute environmentally catastrophic options for Latin America (Alimonda, 2011; Gudynas, 2015). In this regard, the new lithium extractivism is an emblematic example of a strategic mineral for the renewable energy transition and the green

electromobility industry in the Global North. Lithium exploitation occurs under the same productive and historical conditions of green capitalism but with colonial features, generating new waves of exploitation of subalternized indigenous territories, such as the salt flats of the South American Andes. According to Gobel (2013), this generates new unsustainability. From there, a politically committed decolonial political ecology emerges, given the direct experience and confrontation with poverty, domination, and colonialism, as well as constituting a field of study committed to social justice, liberation, and anticolonial and decolonizing struggles oriented towards environmental justice and radical policies (Perreault, 2015).

Currently, one of the most dynamic discussions in Latin American political ecology is regarding extractivisms (cf. Gudynas, 2015), which refer to "activities that remove large volumes of unprocessed natural resources (or that are in a limited way), especially for export, according to the demand of the central countries" (Acosta, 2017, p. 5). An example is the lithium extractivism that we analyze in this article. Latin American political ecology also discusses the emergence of neo-extractivism by progressive governments in South America, characterized by a strong State presence and social legitimation by the distribution of some of their surpluses in social policies, which continues to fuel their colonial dynamic of local mono-producer exploitation and its dependence on international markets (Gudynas, 2018; Lander, 2016). This process is relevant for the new lithium extractivism because there is important State participation in the control of its property in Chile.

In this way, extractivism and neo-extractivism are part of the same process of capital expansion that reinforces Latin America's historically subordinate role in the international division of labor. This occurs especially in indigenous and rural territories that are usually most exploited to extract their natural resources, which become merchandise as "commodities" in a conjunctural fever of international demand. Thus, the relationship between dependency and socio-environmental devastation of colonially subalternized territories is reproduced, as occurs in the Andean regions of the Southern Cone. To the extent that all this is backed by the neo-extractivist State, local communities are gradually abandoned by public institutions to cope with extractivist corporations.

2.2. Lithium mining as a green extractivism

The current worldwide lithium fever comes from the huge demand from the green electromobility industry and technological energy storage devices, which, in turn, comes from national policies for an energy transition to zero carbon. These policies were outlined within the commitments established at the Rio+20 summit and the 2015 Paris Agreement, signed by industrialized and developing countries to reduce their CO₂ emissions. These agreements were inspired by the paradigm of the Green Economy as a new green rhetoric of global capitalism that seeks to create an economy that "has low carbon emissions, uses resources efficiently, and is socially inclusive" (PNUMA, 2011: p. 2). This economy aims to rebuild natural capital as a "fundamental economic asset and source of public benefits" (PNUMA, 2011), and achieve sustainability of production (SELA, 2012), but "remain[ing] within capitalist rationality" (Brand & Lang, 2019: p. 57). In 2008, G20 countries established environmental mitigation measures and began to transition to green economies to overcome the economic crisis. The governments of the major commodity-consuming powers, such as China and the United States, established a series of economic incentives to promote so-called clean energies (SELA, 2012).

This emphasis on carbon emissions and their measurement has left aside aspects such as the ecological footprint and environmental justice issues; instead, it has promoted a green recovery (Valdivieso, 2012) that hides the increase in consumption and investments in megaprojects with low ecological credibility and that is presented as low carbon emitters. Examples are wind megaprojects, desalination mega-plants, forestry monocultures, and cobalt, copper, and lithium mining for technologies based on renewable energy. However, these megaprojects reproduce the

traditional extractivist logic of nature's coloniality, consequently leaving numerous socio-environmentally-degraded territories, reinforcing the historically subordinate role of the Global South as a provider of raw materials for the green economy (Altomonte & Sánchez, 2016; Dunlap, 2017) of the Global North. We term this as green extractivism, the logic of which is fully reproduced from the climate change mitigation proposals, which end up transferring the environmental costs of "zero-carbon lifestyles" of the Global North to the ecologies of the Global South (Gobel, 2013).

2.3. Lithium extractivism and water injustice in the Global South

With the advance of new green extractivisms in Latin America and Chile, new waves of community, indigenous, and rural resistance have appeared on the continent. Local people have deployed their environmental knowledge and practices, based on ancestral Andean practices, traditional water knowledge, and hydro-cosmologies about Mother Earth, to propose alternative rationales to the purely economic rationale that emphasizes the colonial nature of lithium green extractivism (Boelens, 2015; Kothari et al., 2019).

These indigenous and rural struggles in defense of waters and territories have been conceptualized under the rubric of water justice, a variant of environmental justice (cf. Bullard, 1990). In effect, water justice is inserted in the interdisciplinary subfield of the political ecology of water, which understands water as a socio-natural hybrid and water justice as "the interactive societal and academic endeavor to critically explore water knowledge production, allocation and governance and to combine struggles against water-based forms of material dispossession, cultural discrimination, political exclusion and ecological destruction, as rooted in particular contexts" (Boelens et al., 2018, p. 22). It focuses on extractivisms' uneven impacts on hydro-social ecosystems and processes with an emphasis on unequal water distribution (rights, laws, property) and processes of cultural recognition and political participation of communities (Zwarteveen & Boelens, 2014; Sultana, 2018).

Regarding unequal water distribution, our analysis is in the Salar de Atacama, which is inserted in the political economy of Chilean neoliberal neo-extractivism that dates to the Pinochet dictatorship (1973–1990). Among other substantive changes, the Pinochet regime and the Chicago Boys privatized the country's water through the 1981 Water Code, producing a market for water rights where the State overgrants rights, which are then traded in the markets (cf. Bauer, 2015). This water market has generated an unequal allocation and distribution of water rights in the nation's river basins. Consequently, today, water rights are highly concentrated in transnational and national corporations, grouped in the country's mining, hydroelectric, forestry, and agribusiness extractivisms, which use them to expand their extractivist operations of raw material production aimed for export (cf. Yañez and Molina, 2011; Bauer, 2015). In response, resistance, protests, mobilization, and local transformative policy emerge from the current hegemonic extractivisms, pushing the social process (cf. Harvey, 1996) toward the (re)construction of other ontologies and ways of governing water and territories.

The abovementioned highlights that social mobilization and political participation is a central axis of the social struggles for water justice in the hydro-social territories of the Global South. Such participation and mobilization reveal that there are other alternative rationales, which dispute the political and symbolic space of extractivism and the new colonial green economy. One of these is indigenous people's knowledge of nature, particularly based on ancestral hydro-cosmologies (Boelens, 2015), today framed in new collective projects based on Good Living or *Buen Vivir* (Acosta, 2013), pluriverses, and communal ontological rationalities of the natives (Kothari et al., 2019). Their main demands are to stop the advancement of extractivist projects that strip them (once again) of their ancestral territories and sacred sites (cf. Makaran and López, 2018; Ulloa, 2020). In short, the indigenous people are experiencing multi-scaled decolonial struggles for water justice in the Global

South to cope with lithium and other extractivisms triggered by the green electromobility policies enacted in the Global North.

3. Materials and methods

This research used a multi-method approach. First, ethnographic fieldwork was carried out in the Salar de Atacama basin between 2016 and 2018. Semi-structured interviews were given to leaders of both the Atacameño communities and the Council of Atacameño People, including an irrigator. Union leaders and representatives of the main lithium corporations (Albemarle and SQM), public officials of state institutions (CONAF,¹ DGA,² SMA³), and researchers from Chilean universities were also interviewed. A total of 18 interviews were conducted; the interviewees' profiles can be seen below in Chart 1. Second, audio recordings at three meetings on lithium and water were made (Chart 2). Finally, documentary sources on lithium mining, markets, water, and socio-environmental processes on the Salar de Atacama basin were collected, as well as technical reports from public institutions, scientific articles, theses, press releases, books, and online information from lithium companies. All these materials were coded, organized, and analyzed to outline a decolonial political ecology of lithium extractivism and its linkages and feedback with water injustices and the green electromobility industry.

4. Results

4.1. Lithium extractivism as a new coloniality of nature in the Salar de Atacama

*The markets are Asian, Americans, and there are also buyers in Germany ...*⁴

4.1.1. North-South linkages and asymmetries in the international lithium market

The historical North-South linkages and asymmetries are keys to understanding the coloniality of lithium extractivism, which reveal the current dynamics of the international lithium market. Lithium has traditionally been a raw material for the manufacture of ceramics, air conditioning, glass, and frits (Comisión Nacional del Litio, 2014; COCHILCO, 2013). In recent years, it has become highly attractive and in demand for electromobility and electronic devices and the energy system industry, especially for the manufacture of lithium-ion batteries and other energy storage technologies, which have notably triggered its demand (COCHILCO, 2017; Grosjean et al., 2012; Tarascon et al., 2011; Dunn et al., 2011). The main raw materials marketed from this mineral are lithium carbonate, lithium hydroxide, butyl lithium, and lithium chloride, which are essential for the new generation automotive and energy industries. Thus, while the demand for lithium was 35% for ceramics and glass and 29% for batteries in 2012, in 2016, it reached 30% and 39%, and in 2019, 18% and 65%, respectively (USGS, 2012; USGS, 2016; USGS, 2020). This means that global demand for lithium for rechargeable batteries doubled in the last decade, a period in which green capitalist policies to encourage low-carbon technological transformations aimed at mitigating climate change began to be applied strongly.

The current demand for lithium comes mainly from the Global North economies where the development of green electromobility is located. In 2016, China (24%), South Korea (20%), Japan (16%), the United States

¹ Corporación Nacional Forestal (National Forest Corporation).

² Dirección General de Aguas (National Water Directorate).

³ Superintendencia de Medio Ambiente (Environmental Superintendence).

⁴ I. 18. Manager of Community Relations, Albemarle Salar, San Pedro de Atacama.

Code	Date	Position	Gender	Institution	Location
I.1	June 2016	Atacameño leader	Male	Solcor community	San Pedro de Atacama
I.2	June 2016	Local journalist, ex-Atacameño leader	Male	Solor community	San Pedro de Atacama
I.3	May 2018	Farmer and irrigator	Male	San Pedro & Vilama river's irrigators	San Pedro de Atacama
I.4	February 2018	Atacameño leader	Female	Council of Atacameño People	San Pedro de Atacama
I.5	June 2016	Atacameño leader	Female	Catarpe community	San Pedro de Atacama
I.6	May 2018	Atacameño leader	Male	Peine community	San Pedro de Atacama
I.7	June 2016	Atacameño leader	Male	Council of Atacameño People	San Pedro de Atacama
I.8	June 2016	Anthropologist	Male	University of Antofagasta	Antofagasta
I.9	June 2016	Economist	Male	University of Antofagasta	Antofagasta
I.10	March 2018	Physicist, Member of Chilean Lithium Commission	Male	University of Chile	Santiago of Chile
I.11	June 2016	Union leader	Male	SQM	Antofagasta
I.12	June 2016	Union leader/Atacameño Leader	Male	Albemarle Salar/Peine Community	San Pedro de Atacama
I.13	June 2016	Union leader	Male	Albemarle La Negra	Antofagasta
I.14	June 2016	Inspection chief	Male	DGA	Antofagasta
I.15	June 2016	Inspection Director	Male	SMA	Antofagasta
I.16	June 2016	Professional, Natural Reserve Los Flamencos	Male	CONAF	San Pedro de Atacama
I.17	June 2016	CEO, Sustainability	Male	SQM Salar	Antofagasta
I.18	June 2016	Manager of Community Relations	Male	Albemarle Salar	San Pedro de Atacama

Chart 1. Interviewee profiles.

Source: own elaboration.

Code	Date	Title	Institution	Location
M.1	April 2019	International Seminar: <i>Energías verdes y extractivismo en salares: El costo socioambiental del litio</i>	University of Chile, Observatorio Plurinacional de Salares Andinos-OPSAL, FIMA.	Santiago de Chile
M.2	February 2018	6 th Plurinacional Meeting: <i>Movimiento por la Defensa de las Aguas y los territorios-MAT</i>	MAT	Calama
M.3	May 2020	Webinar “In conversation with Eric Norris, President of Lithium Albemarle.”	Albemarle	Online

Chart 2. Meetings recorded.

Source: own elaboration.

(10%), and Belgium (10%) led the list of consumers of this mineral (López et al., 2019). China has placed itself at the forefront of the economies making batteries and electric cars (Jato Dynamics, 2019), and a high proportion of automotive companies and the wireless device industry (cell phones, tablets, notebooks, etc.) have their factories in this country. China also has 56% of world sales of electric cars, thus being the undisputed global leader, followed by Europe with 23% and North America (USA-Canada) with 17%; this leaves the rest of the world with

only 4% (Jato Dynamics, 2019). The increase in demand in the Global North responds to the implementation of green policies to promote the use of electric cars as part of the international commitments signed to reduce climate change's effects.

On the other hand, Australia leads the world production of lithium, with an annual production of 42,000 tons in 2019. It is followed by Chile with 18,000 tons (brines), then China with 7500 tons (rock and brines) and Argentina (brines) with 6400 tons (USGS, 2020). However, in gross

terms, the largest amount of lithium reserves are located in the Andean salt flats of the countries of the Southern Cone (Argentina, Bolivia, Chile), with 54% of total resources and 66% of total reserves (COCHILCO, 2017).

Table 1 shows the North/South linkages and asymmetries of the international lithium market, where the largest reserves and production of lithium are concentrated in the Southern hemisphere. In turn, the South has almost no countries that manufacture energy storage and electro-mobility technologies, nor do they consume it. In this dynamic, China's role as a power present in the entire global production chain—from the possession of resources, reserves, lithium production, and its role as a manufacturer of energy storage technology and electromobility, and finally, as its consumer—is striking.

4.1.2. Historical evolution of lithium mining in Chile

Lithium mining in Chile is concentrated in the Salar de Atacama and has its origins in 1962 when this mineral was discovered in the salt flat. Then, between 1966 and 1977, the State-owned Production Development Corporation (CORFO) constituted rights to 59,820 lithium mining properties (Cámara de Diputados, 2016). Pinochet's civil-military dictatorship (1973–1990) established specific legal frameworks for lithium mining with respect to other mining operations, which were decisive for its development. This is how, in 1976, this mineral was declared of “nuclear interest” in the organic law of the Chilean Nuclear Energy Commission (CCHEN) (COCHILCO, 2013). Then, Decree Law (DL) 2886 of 1979 was signed, which declared it a non-concessional and strategic resource of national interest, leaving its property reserved for the State (Comisión Nacional del Litio, 2014). Subsequently, article 8 of the Mining Code of 1983 declared that lithium's exploration and exploitation could be carried out by the State and by administrative concessions or special operation contracts under the conditions established by the President of the Republic via supreme decree. Thus, the executive power took control of lithium dynamics in Chile, whose exploitation has been carried out through public-private partnerships that gave lithium mining a neo-extractive character.

In 1980, CORFO signed contracts with the US Corporation Foote Mineral Company to exploit lithium in the southern sector of the Salar de Atacama through the Chilean Society of Lithium Limited (Sociedad Chilena del Litio, SCL), obtaining authorization to exploit 200,000 tons of lithium in 1984 (Comisión Nacional del Litio, 2014). Then, in 1989, CORFO sold its stake in SCL, which was acquired by the Rockwood mining company in 2012. In 2015, it was acquired by the North American holding company Albemarle, which also controls the ownership of the largest lithium mines in Australia and is an ally of the Chinese

Table 1

A global production chain of green electromobility: lithium resources, lithium producers, lithium importers, and electric car consumers by country/region.

Lithium resources by country (million/tons)	Lithium reserves (million/tons)	Lithium producers	Lithium importers	Electric car consumers
Bolivia: 73	Chile: 8.6	Australia (54.5%)	China: 24%	China: 56%
Argentina: 17	Australia: 2.8	Chile (23.6%)	South Korea: 20%	Europe: 23% (Norway, Germany, France, Netherlands, United Kingdom)
Chile: 9	Argentina: 1.7	China (9.7%)	Japan: 16%	USA – Canada (17%)
USA: 6.8	Others: 1.1	Argentina (8.3%)	USA: 10%	Rest of the world (4%)
Australia: 6.3	China: 1	Zimbabwe (2.07%)	Belgium: 10%	
China: 4.5	USA: 0.630			

Source: Own elaboration based on López et al. (2019); USGS, 2020; Jato Dynamics, 2019.

Tianqi group (Albemarle, 2020; Talison, 2019). In 2016, CORFO signed a new contract with Albemarle to authorize the duplication of lithium exploitation, approving an extension of extraction quotas that reaches 540,240 tons until 2044.

Parallel to SCL, in 1986, CORFO formed the Sociedad Minera Salar de Atacama Ltda (MINSAL) with the mining companies AMAX and MOLYMET, authorizing an extraction quota of 180,100 tons (Comisión Nacional del Litio, 2014). Subsequently, MINSAL is joined by the former state-owned Sociedad Química y Minera de Chile (SOQUIMICH, current SQM), a company that will eventually control MINSAL. In 1996, SQM began the extraction of lithium carbonate in the salt flat (Comisión Nacional de Litio, 2014). As stated by a Union leader from SQM [I.11], “At that time [2012] there was no SQM brine extraction control, it was a judge and part of the brine in the salt flat. There was no reliable control.” Both companies, Rockwood-Albemarle and SQM, continue to exploit the Atacama salt flat and are the only ones who exploit lithium in Chile. In fact, for many years, SQM was the first worldwide producer, being displaced in recent years by Australian lithium companies (USGS, 2019).

In Chile, the recent history of lithium has been full of conflicts and complaints of various causes, such as fraud to the treasury, environmental damage, anti-union practices, breach of contracts with CORFO, and illegal brine export, among others. The Union leader from SQM [I.11] recalls that “Since 2010, we have been filing lawsuits against SQM for anti-union practices ... we made complaints to the Inter-American Court of Human Rights about the violated union rights.” These situations led to the formation of two investigative commissions in the Chamber of Deputies, numerous lawsuits, the formation of a *Comisión Nacional del Litio* (Lithium National Commission) that formulated a proposal for public policy, and the creation of the Non-Metallic Mining Committee during the left-center wing government of Michelle Bachelet (2014–2017). The latter was eliminated by the right-wing Sebastián Piñera's government (2018–2021).

Thus, in 2016, CORFO sued SQM for breach of contract, maintaining high tension between both entities. They reached an agreement in 2018, which basically consisted of a contract to expand SQM's lithium extraction. Finally, SQM was accused of monopolistic practices with the entry of the Chinese holding company Tianqi as a shareholder, which also controls the Talison mining company in Australia together with Albemarle. It is important to mention the role of Julio Ponce Lerou, one of the main shareholders of SQM, Pinochet's former son-in-law, who led CORFO during the dictatorship and, in that context, bought the former SOQUIMICH. Ponce Lerou has been questioned historically for cases of fraud to the treasury (cf. Monckeberg, 2001), influence peddling, and corruption via illegal financing of politicians and parliamentarians in Chile (Skoknic, 2017). This highlights a constitutive characteristic of lithium extractivism: its corrupt nature (cf. Gudynas, 2018).

4.1.3. Commodification of the Andean salt flats: the “lithium triangle”

*We are clearly talking about a mineral that will allow production at all levels of world industry through batteries based on lithium.*⁵

In the implementation of extractivisms that commodify nature, business and government discourses are produced to generate acceptance and legitimation around new commodities. Thus, new modern/colonial extractivist territorialities are established (Jerez & Marañón, 2017), generating new waves of commodification and subordination of nature and local cultures via global extractivist colonialisms. In lithium's case, new extraction territories were incorporated, such as the so-called “lithium triangle” (Gobel, 2013), an Andean area of the Southern Cone that has the largest lithium reserves in brines (see Fig. 1). The “lithium triangle” encompasses the Atacama (Chile), Hombre Muerto (Argentina), and Uyuni (Bolivia) salt flats (Riva, 2012; Koerner,

⁵ I.13: Union leader, Albemarle La Negra, Antofagasta.



Fig. 1. The lithium triangle as represented in international business circles. Source: <https://www.economist.com/the-americas/2017/06/15/a-battle-for-supremacy-in-the-lithium-triangle>.

2008; COCHILCO, 2009; Gundermann and Goebel, 2018). These South American salt flats territories were baptized by *Forbes* magazine as the “Saudi Arabia of lithium” (Koerner, 2008) and even as “lithium OPEC” (Barreno, 2012).

Lithium companies have disseminated these nomenclatures globally due to their significance to the green electromobility boom. For instance, in 2012, when this boom was just beginning, the Spanish media *El Mundo* said that “the Atacama salt flat ... form, together with the Uyuni salt flats in Bolivia and Hombre Muerto in Argentina, what is known internationally as the lithium triangle, for the importance that this mineral will have in a few years” (Barreno, 2012). Then, in 2018, when the green electromobility has grown steadily (cf. USGS, 2012; USGS, 2016; USGS, 2020), the Chilean media *La Tercera* corroborated that “lithium companies in the world are seeking to secure their supply due to the increasing value of this mineral. The exploitation of this industry is in salt flats in the north of [Chile], in part of the so-called lithium triangle ... that holds a large part of the global mineral reserves” (*La Tercera Digital*, 2018). This global extractivist discourse has been inscribed into the local mining workers as well: “We are the most important lithium triangle in the world [that] ends up feeding a large lithium market, one of the main ones being the issue of batteries destined for the [electric] automobile industry. For all that we are experiencing worldwide, that is, carbon footprints, it allows you to displace this consumption of fossil hydrocarbons, which under certain international treaties is [seeking] to move towards cleaner energy, being lithium, and especially Chile, the cheapest exploitation in terms of cost worldwide” [I.13: Union leader, Albemarle La Negra, Antofagasta]. Thus, the lithium triangle—particularly its Chilean side—can be framed as a symbol of the (neo)colonial extractivist territorialities, in which different corporate

strategies are enacted to generate social legitimation and acceptance through the commodification of nature and territories in the Global South.

4.1.4. Salt flats and brine colonially configured as mining property

*The extraction of brine as a water resource is not associated with the Chilean Water Code but with the Mining Code.*⁶

The extraction of brine containing water by lithium mining configures an extractivist territoriality that overlooks other local territorialities, knowledge, and Andean cosmovisions of nature. For the area's indigenous communities, the Salar is a natural hydric entity that feeds the place's non-human and human life. In effect, the Atacama salt flat is an evaporitic body that contains brackish water because of the recharge of surface and underground channels that carry salts caused by the leaching of volcanic rocks (Risacher et al., 1999). The salt flat is a complex aquifer system where different salinity and quality waters interact, which receive water contributions from the San Pedro and Vilama rivers in the northern sector of the basin and underground contributions from aquifers and ephemeral streams that flow through the ravine of the Andean altiplano (Garcés, 2020; Díaz del Río et al., 1972).

However, brines—which make up most of the salt and from whose waters in different degrees of salinity lithium and potassium are extracted—are legally recognized as “mining property” or as a “mineral,” generating institutional denial of its constitution as a unique water ecosystem, as the Inspection chief of the DGA of Antofagasta outlined above. In this respect, the Chilean Mining Code of 1983, Title I, Article 1, states that “The state has absolute, exclusive, inalienable, and essential dominance of all mines, including covaderas (guano deposits), metal sands, [and] salt flats” (Ministerio de Minería, 1983). In this way, and the same as rock or sand deposits, salt flats are defined by the State as static mineral deposits. However, brines have a hydrodynamic behavior and are water bodies in constant movement; their extraction can affect the mining concentrations of other areas (Comisión Nacional del Litio, 2014). “The Mining Code does not apply to this, so a complete modification must be made because salt flats are dynamic systems. They are complex. You can dry the salt if you exploit it improperly ... and then everything ends [because] rivers flow from there, [and] there are associated flora and fauna ... This situation has not been resolved by the State [yet]” [I.10: Physicists, Member of Chilean Lithium Commission, University of Chile, Santiago]. Thus, the non-recognition of the brine as a water entity allows the mining companies to only account for their freshwater expenses coming from the salt wells. In this way, the impact of the large-scale evaporation of millions of liters of water from the brines is invisible. Only freshwater sources from aquifers and streams, which constitute part of the territory's water dynamics, are recognized within the Salar as “water resources.” This makes it difficult to estimate the real water impact of lithium extraction.

In this regard, the company Albemarle declares that “Atacama's brine is ten times more saline than seawater. It has no other use than as a resource, as a mineral” [M.3: President of Lithium Albemarle, in Webinar: “In conversation with Eric Norris, President of Lithium Albemarle”]. This reveals that the Salar de Atacama is dominated by the extractivist and economist mining vision limited to the mineral resource, which does not acknowledge its hydrogeological complexity nor indigenous uses and world views of the Salar. This is another angle of the colonial nature of lithium extractivism placed in the Global South, intimately linked with the electromobility production chain situated in the Global North.

⁶ I.14: Inspection chief, DGA Antofagasta.

4.2. Lithium mining as a green extractivism

*Tons of lithium in grain, in powder, or without greater added value—that is what is shipped on the ships. It is very basic. That's the extractivist economy, typical of South American countries without added value.*⁷

4.2.1. Green economy as a new boom of lithium extractivism

As mentioned above, lithium demand for the manufacture of rechargeable batteries doubled in less than ten years (USGS, 2012, 2016, 2020), a process directly related to carbon mitigation policies (c.f. Gobel, 2013; Fornillo, 2019; Observatorio Plurinacional de Salares Andinos, 2021). This boom's dark side is new pressure to expand lithium extractivism in the high Andean salt flats in Bolivia, Argentina, and Chile. In fact, the new colonial inequality of this boom is already projected, as “a low-carbon future points to a more intensive demand for minerals, which would definitely have an effect on developing countries, rich in these resources” (La Porta, 2019, p. 28). In turn, this boom has triggered new eco-colonial rhetoric such as “Green Mining,” “Climate Smart Mining,” even “Mining for a low carbon future” (CEPAL, 2019). The boom in green electromobility in the Global North and the pressures it exerts on the Global South's local ecologies operate through two specific processes on a local scale.

The first process is through the expansion of CORFO's lithium extraction quotas to Albemarle and SQM companies. For Albemarle, this was done by signing a collaboration agreement with the Salar de Atacama communities, generating local tension—although this agreement was presented as a strategy to “prevent conflicts with the communities.” For SQM, an agreement was signed with CORFO in 2018, after a long arbitration where CORFO denounced SQM for environmental and fiscal breaches by the mining company, a conflict that was resolved in exchange for higher royalties and facilities to the State. This agreement was rejected by the Atacameño communities and local environmental organizations for violation of indigenous rights and for environmental damage (Argento et al., 2019; El Desconcierto, 2018; Massai, 2018). From a local viewpoint, the lithium corporations “do not understand that they are in an indigenous territory and that they have to consult first with the communities regarding everything they want to do inside” [I.4: Atacameño leader, Council of the Atacameño People, San Pedro de Atacama].

The second process of pressure exerted by lithium extractivism in the Salar de Atacama occurs through the appearance of new companies exploiting the Salar, which have presented new extraction projects. For example, the “Atacama Lithium Project” by the Canadian company Wealth Minerals, which planned to exploit the northern sector of the salt flat, plans to explore the Pujsa Salt Flat. Also, the company Lithium Chile has lithium exploration projects in the Turi and Tara salt flats, near the Salar de Atacama.

All these places are indigenous territories and basins that contain protected wetlands, such as Ramsar sites, and several of them are part of Los Flamencos National Reserve. Therefore, lithium extractivism as part of a chain of green capitalism and low carbon transformations continues to reproduce the traditional and colonial North-South asymmetries, affecting indigenous ecosystems of the Global South for green lifestyles of industrialized economies (Gobel, 2013; Riva, 2012).

4.2.2. The lithium paradoxes: decreased carbon emissions in industrial economies versus the socio-environmental exhaustion of the Salar de Atacama

In line with the above, lithium extractivism as “mining for a low-carbon future” is, in itself, a colonial statement, representing the Global North's view of metabolisms needed by the electromobility and “non-fossil” energy transitions. It is assumed that greater mining extraction would bring a sustainable and “low carbon” future. Indeed,

some countries in the North have statistically demonstrated that they have decreased their carbon emissions through policies that stimulate electromobility. For example, countries such as the Netherlands, Germany, and France will ban the sale of internal combustion vehicles from years 2025, 2030, and 2040, respectively. Norway leads the way, as it has no less than 46% of its total national automotive fleet in electric vehicles (Cabrera & García, 2019).

However, recent research in South America shows that the greater the extractivism, the greater the socio-environmental degradation of the territories, regardless of the type of manufacturing that will be elaborated with the “resources” (cf. Gudynas, 2015, 2018). In parallel, research conducted in the Global North has interrogated electric vehicles' ecological impact (cf. Ellingsen et al., 2013) and the availability of material to produce the batteries (Ajanovic & Haas, 2018), which are being extracted mainly from the Global South. This geographic and epistemic distance makes invisible the socio-ecological effects of the extractive metabolism of the electromobility industry that has triggered a series of socio-environmental conflicts in the salt flats of Bolivia, Chile, and Argentina, where more projects appear to exploit lithium (Argento et al., 2019; Jerez, 2018). It was in this scenario that CORFO authorized the quotas of the existing lithium exploitations to triple from 2016 (Albemarle) and 2018 (SQM). This demonstrates the colonial shadow of electromobility and the limited scale with which carbon reduction policies are being considered, without questioning the extractivisms and injustices that these measures produce on indigenous hydro-social territories in the Global South.

4.3. Water injustices in the Salar de Atacama

*The communities reacted a little late—although, we have been saying [that] here, there is a problem with the water.*⁸

4.3.1. Hydro-social impacts of lithium extractivism

To illustrate the water injustices of lithium extractivism and therefore the coloniality of the green electromobility, it is important to recall that lithium mining is water mining because the extracted material is not a rock or other solid mineral; it is brine—that is, a liquid that contains lithium and other minerals (Argento et al., 2019). Indigenous people are aware of this hydro reality in their lands: “This is a mine that is liquid. It is not dry, so that brine is pumped and spilled and thrown into some solar evaporation pools” [I.7: Atacameño leader, Council of Atacameño People, San Pedro de Atacama]; “Brine is a kind of mineralized water that occurs naturally in the salt flats of the Antofagasta region” [I.11: Union leader, SQM, Antofagasta]. On this basis, they are also aware of how lithium extractivism is depleting their water ecosystems: “They are drying up the brine, and the sun is the one that is doing everything by evaporating the water” [I.12: Union leader/Atacameño leader, Albemarle Salar/Peine community, San Pedro de Atacama].

Currently, only lithium companies extract more than two million liters of water (fresh and saline) daily from the Salar de Atacama, considering that SQM is authorized to extract between 1500 and 1700 L per second (l/s), and Albemarle 442 l/s of brine (COREMA, 2006; SEA, 2016). In addition, SQM has the authorization to extract 240 l/s and Albemarle 23.5 l/s of freshwater, according to the new agreements signed with CORFO that expand their quotas. These extraction contracts demonstrate that brine is implicitly recognized as a water ecosystem. For instance, one of the lithium companies' representatives said that “as this is watery, what we do is withdraw water in the evaporation ponds. We eliminate water, [and then] we promote solar evaporation” [I.17: CEO Sustainability, SQM Salar, Antofagasta].

Therefore, as mentioned above, one of the existing problems is that

⁷ I.15: Inspection Director, SMA Antofagasta.

⁸ I.4: Atacameño leader, Council of Atacameño People, San Pedro de Atacama.

by not explicitly recognizing brine as a water entity in legal terms but as mining property, the hydro-social impacts of brine exploitation are invisible, and only the freshwaters of the salt flat are considered. This occurs in the context of a water crisis in the Salar de Atacama basin. For example, in 2016 and 2017, the General Water Directorate (DGA) declared the water depletion of the San Pedro and Vilama river basins, respectively, which are the main rivers feeding the Salar de Atacama basin (DGA, 2016; DGA, 2017). The water crisis of this salt flat is pressing because, after three decades of intense mining (lithium and copper), CORFO itself (through a hydrogeological model) recognized that the exploitation of the Salar's water far exceeds its recharge capacity. Indeed, in the natural regimen of the salt flat, its annual water inflows are like its outflows, considering an interval between 6575 and 6975 l/s; due to historical overexploitation, the outflows reach an average annual rate of between 8442 and 8842 l/s (Comité de Minería no Comité de Minería No Metálica, 2018). That is, the over-extraction of water exceeds the water inflows to the salt flat by more than 2000 l/s. This simple imbalance demonstrates the water unsustainability of lithium extractivism in the Salar de Atacama. In fact, in the few checks carried out by the environmental institutions (SMA), water is the main problem of companies' non-compliance with their environmental commitments: *"The main problem is always the water issue. They draw more water than they promised ... Both companies (SQM and Albemarle) have problems with this issue ... no matter how much water they pump, there are not mitigation measures for flora and fauna"* [I.15: Inspection Director, SMA, Antofagasta].

The panorama of water injustice worsens when considering the impacts on the local people, mainly indigenous communities that are aware of lithium mining's impact on the Salar: *"The most powerful environmental impact of lithium is the extraction of lithium brine. The brine is mineral water, that is, just water. SERNAGEOMIN treats it as a harmless product that is worth nothing, but it is mineral water, and they are extracting it 24 h a day, 365 days a year"* [I.1: Atacameño leader, Solcor community, San Pedro de Atacama]. Another informant from the area indicates that *"we don't know how much water they are taking out of the salt flat. But obviously it is a lot, and it is much more than they should get to preserve the integrity of the salt flat"* [I.2: Local journalist & ex Atacameño leader, Solor Community, San Pedro de Atacama].

The water injustices triggered by lithium extractivism have also contributed to a decrease in agricultural activities, such as the cultivation of corn, quinoa, vegetables, and fruit, along with small-scale Andean livestock that develops in the Salar, mainly with guanacos, llamas, and alpacas. In the past, the situation was different: *"Several years ago, an 80-year-old grandfather said: 'I grew up on the land, and when my parents planted and I had to help, we planted and plowed the earth, and the earth remained wet for 15 days with a humidity that allowed to grow the fruits, to have the farm, the trees, to have the vegetation.' However, he said, 'I am 80 years old now, and I am realizing that I water the earth, and three days later, it is totally dry'"* [I.4: Atacameño leader, Council of Atacameño People, San Pedro de Atacama]. The advance of mining extractivism has discouraged agriculture in the Salar de Atacama. Considering that one of the closest towns, San Pedro de Atacama, has historically been an agricultural oasis, but where there is a shortage of water currently because *"mining takes the water away. All this is going to dry the earth. In the past, agriculture was very big, but the old people had to do it because they lived from it. They did not have mining because mining was not here yet. They lived from what they had to cultivate."* [I.3: Farmer and irrigator, San Pedro & Vilama river's irrigators, San Pedro de Atacama]. In short, water is being depleted by lithium extractivism in the Atacama Desert, and the plight for Atacameño communities is that they *"reacted a little late"* [I.4: Atacameño leader, Council of Atacameño People, San Pedro de Atacama].

4.3.2. Ethno-cultural fractures

*I think the worst thing that is happening to us is that there is a lot of money.*⁹

*I believe that money is not very good for the communities ... Yes, that divides us.*¹⁰

The above quotes illustrate a growing concern in local ecology: The social fabric of the Atacameño communities has been fractured by mining extractivisms because the main lithium companies (SQM and Albemarle) and the copper companies (Escondida and Zaldívar) maintain relationships focused mainly on the transfer of monetary resources to cover the communities' needs. This happens due to the State's abandonment of the communities, in which *"people say, 'They [mining companies] are taking the resources from us, but on the other hand, this brought me benefits that otherwise, due to the lack of the presence of the State, would not have been possible'"* [I.8: Anthropologist, University of Antofagasta]. This fracture is also due to the indigenous State institutions that ended up treating the communities as clients. In other words, generating a strong process of commodification of the communities as "subjects receiving resources."

This configuration has emerged closely associated with the last two decades of both new indigenous regulations and growing lithium extractivism in the Salar de Atacama. At the end of the 1990s, the State incorporated the Lickanantay communities into its indigenous policies. A decade later, in 2008, Chile ratified ILO Convention 169 that grants territorial rights and indigenous consultation that could serve to cope with new extractivist projects. These legal frameworks gave legitimacy and recognition to the communities over their ancestral territories, placing them as unavoidable interlocutors in the basin (Bolados, 2014; Morales et al., 2019). However, this recognition established functional organizational structures for extractivist policies that generate tension about the conditions of ethnic recognition and ascription (Argento et al., 2019), placing communities as interlocutors and recipients of resources from the companies (Morales, 2013; Gundermann, 2018). This is a sort of compensation policy in which the State (CORFO) authorizes higher quotas for lithium extraction, and, in exchange, indigenous communities receive cash compensation from the lithium corporations (CORFO, 2019). For instance, the already-mentioned authorization of higher quotas for lithium extraction allowed the Albemarle company to sign collaboration agreements with indigenous communities in 2016 (cf. Gundermann and Goebel, 2018). Recently, in 2020, SQM signed up an "extra-judicial agreement" with the Camar Atacameño community for CL\$1.700 million (~US \$2.3 million) that included water's source protection from the Salar (Azócar & Cárdenas, 2020 August 7th).

All this has generated internal fractures in the communities due to competition for these resources from the lithium companies SQM and Albemarle. This affects the indigenous worldview because, as an Atacameño leader indicates, *"We are living it—the deep division that these agreements generate in our communities, these monstrous exploitations ... Money [comes] in an incredibly easy way, but it is affecting us in terms of losing a sense of the earth. They come and deliver us money so easily, and we are divided"* [I. 6: Atacameño leader, Peine community, San Pedro de Atacama]. The ethno-cultural fracture of lithium extractivism has contributed to a de-ethnification, deepening the commodification of daily life itself and a neocolonial production of indigenous communities as recipients of the mining companies' resources.

⁹ I.2: Local journalist & ex Atacameño leader, Solor Community, San Pedro de Atacama.

¹⁰ I.5: Atacameño leader, Catarpe community, San Pedro de Atacama.

4.3.3. Controversies around water in the Salar: the “puri” (water) from the Andean-lickanantay ancestral worldview and the recognition of brine as a water entity

In addition, the lack of State recognition of the hydro-social complexity of the salt flat waters constitutes one of the biggest controversies around lithium mining. In this section, we wish to deepen this from the Andean worldview. As we mentioned above, the mining legislation in Chile establishes that the brine is a mining resource. This generates a fragmentation of the salt flat and the non-recognition of brines as water entities, closely related to the internal fracturing of communities. For the Atacameño people, water, or *puri* in their Kunza language, has a sacred character directly linked to the land and the people because “water and land are life. The waters cannot be traded. Water is sacred. It is powerful, it is life, it is our vein, it is our blood ...” [M.2: Atacameño farmer, Toconao community, MAT meeting, Calama].

This ancestral Atacameño cosmovision is totally contrary to the mercantile view of the State and extractivist corporations. The same communities highlight that lithium is obtained through water mining, where a significant percentage of water is extracted from the brines: “In Chile, lithium is water mining. Although the State of Chile distinguishes between saline waters, underground waters, and superficial waters, for the Atacameño world, for us, water is always going to be just one element. Water is life, whether it is saltwater or freshwater. Saltwater and freshwater feed microorganisms, feed living things like flamingos, for example. Freshwater is an element that allows us to live, to exist, even more to us as Atacameños who live in the driest desert in the world.” [M.1: President of the Council of Atacameño People, University of Chile, Santiago]. Lithium extractivism denies the hydric life character of the brine, reducing its definition to a mining resource and denying its complexity and hydro-cosmological diversity—another expression of the coloniality of nature that sees the salt flat only as a mining commodity. This is expressed by a representative of Albemarle, who indicated that “in Chile, brine is a mining resource like copper ... it is not water. It is brine—water that has large concentrations of salt that make unusable for everything else but to be deposited and evaporated to obtain the minerals it contains” [I.18: Manager of Community Relations, Albemarle Salar, San Pedro de Atacama].

The contrast of the mining companies’ extractivist discourse and the indigenous communities displays opposite water ontologies regarding the Salar. While the former fragments nature, there is an integration of the Salar and its waters in the latter’s Andean worldview—an economist’s ontology against a hydro-cosmology that sees Mother Earth as a unit—two epistemes that reproduce the coloniality that Latin American indigenous peoples have been subjected to for centuries, now in the name of green electromobility.

4.3.4. Community mobilizations and legal actions in defense of the Salar

For all of the above, there are growing socio-environmental conflicts pitting communities against lithium companies (Morales and Azócar, 2019), wherein the communities have adopted two strategies. On the one hand, in 2012 and 2016, Albemarle signed agreements with Atacameño in response to pressures from the growing international demand for lithium. The company agreed to provide funds for community projects, and in 2016, it even agreed to transfer 3% of its sales via community projects. This constituted a strategy for the company to avoid conflicts and obtain CORFO authorizations to expand its mineral extraction. On the other hand, for the communities, this constituted “a unique opportunity to monitor the Salar against the advance of a drought. Although, we cannot remove the mining company” [I.7: Atacameño leader, Council of Atacameño People, San Pedro de Atacama].

The situation has been different for SQM and the projects seeking to open new extraction sites in the Salar. In 2007, there was a conflict between SQM and the communities when the company was authorized to increase brine production by 400% because SQM was dumping wastewater from the mining camp near the Peine community (El Mos-trador, 2007). Then, between 2017 and 2018, various protests emerged against the signing of the agreement between SQM and CORFO. There

were roadblocks blocking the entrance to the mining company, hunger strikes, and lawsuits, which ended up ruling in favor of SQM and CORFO. Back then, indigenous people say that “we stopped the work of the SQM plant for eight hours. There were three of us on a hunger strike on the condition that this agreement ends. We will not stop until that agreement is destroyed. We are not going to stop until the governments and the State respect us as indigenous people” [M.2: Atacameño farmer, Toconao community, MAT meeting, Calama].

Finally, in 2019, the communities once again mobilized and confronted the Canadian company Wealth Mineral, which tried to settle in the northern sector of the Salar to extract lithium—an initiative that, through lawsuits, was stopped in court. At that time, the Council of Atacameño People argued the communities’ opposition to new mining initiatives to the local press due to the overexploitation of the Salar and because this project affected lagoons that are part of national reserves and area tourist attractions (Venegas, 2019).

In summary, the non-recognition of brine as a water entity and the lack of State foresight to authorize new extractive projects and new expansions of already-existing extractions is a significant case of water injustice triggered by the lithium extractivism and green electromobility in the Global South.

5. Conclusion

In this work, we delved into the advance of green electromobility and lithium extractivism in the Salar de Atacama, focusing on the serious threat on this basin’s water sustainability because of the following factors: 1) the overexploitation of the territory, more than its water capacity; 2) the denial by both the lithium corporations and the State of the hydric complexity of the salt flats, specifically regarding the brines’ hydric nature, which is essential for the reproduction of salt flats’ ecosystem; 3) the lack of recognition of the indigenous communities’ worldviews, which consider the salt flats as water in various expressions. These factors contribute to concealing the actual scale of the water injustices from lithium extraction. This complex, local socio-ecological scenario constitutes the colonial shadow of green electromobility and the boom of new extractivism waves associated with green technologies. In this way, the ongoing Global North processes of technological replacement with more ecological alternatives that rely heavily on commodities (especially minerals) progress at the expense of the harsh environmental and socio-cultural degradation of territories and communities in the Global South.

These results open new questions for decolonial political ecology, especially about the structural inequalities of the emergent green capitalism being promoted as a solution for climate change. Its metabolic processes are creating a new brand of territorial commoditization, fostered by its new demand for raw materials. This generates new green extractivisms that result in new forms of subalternization of territories that have been historically marginalized and maintained in the periphery of the world system. This process is coupled and enabled by corporate and government narratives that preach the colonial rhetoric of development/progress as a salvationist opportunity of planetary sustainability, which, yet again, is attainable at the expense of these territories, their indigenous and peasant communities, and their knowledge, worldviews, and economies.

We conclude that there is a need to rethink global proposals for climate change beyond the scope proposed by green electromobility, which limits itself to counting carbon emissions but within the green capitalist rationality. We need to widen our scope to include decolonizing proposals based on water justice coming from both the Global North and Global South. We also must acknowledge the value of small-scale socio-environmental processes and recovery. The decolonial criticism of the present work aims to make technological and industrial processes use lower quantities of commodities and to work strongly with restoration policies for the hydro-social and socio-environmental fractures in the territories from which these commodities are extracted. For

this to occur, it is essential to foster local/global dynamics that help build more egalitarian and sustainable socio-ecological partnerships. Otherwise, the green solutions of the Global North will continue to be detrimental for the Global South.

Declaration of competing interest

None.

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