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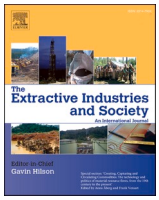

Clean and future-oriented: Local perceptions of lithium extraction in Bolivia during the presidency of Evo Morales

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ABSTRACT

In the past two decades, lithium has gained critical global importance as a transition metal. Under President Evo Morales (2006–2019), the Bolivian government launched a national lithium extraction industry in the Uyuni salt flat. However, efforts to develop industrial-scale extraction of lithium there have been beset by considerable delays. Focusing on the period of Morales' presidency, this article analyses the perceptions of lithium and its extraction amongst people living in the region around the Uyuni salt flat, specifically in the urban centres. In state media and official communication lithium extraction was presented as a 'clean' and 'future-oriented' activity, distinct from traditional mining practices. Public perceptions of lithium extraction as being 'future-oriented' and distinct from conventional mining practices were also rooted in collective memories of the colonial and neoliberal past and the exploitation of Bolivia's wealth by foreigners. Lithium extraction was therefore also associated with a shift towards a decolonial future that was expected to generate wealth. By the end of the Morales presidency, while people in the region still believed in the clean and future-oriented nature of lithium and its extraction, they no longer believed in Morales' ability to generate national or local benefits from lithium production.

1. Introduction

Since colonial times, mining has had a significant influence on Bolivia's economy, environment and national identity. Extensive extraction of silver, zinc, tin and other metals to meet global demand has shaped the nation's development trajectory. However, in recent decades, another mineral present in large quantities in Bolivia has emerged as a critical global resource. Lithium's unique physical and chemical properties make it a critical input into low-carbon technologies, and it has become a key feature of the global discourse (generated primarily in the global North) that promotes mining for the (technology-based) 'green' transition. The global demand for lithium has increased significantly along with investment in the development of technologies for the energy transition, notably electric vehicles (EVs), which use lithium-ion batteries (Gobel, 2013). Other technologies also rely on lithium, including electronic devices (e.g., computers, mobile phones) and industrial production, such as aluminium, ceramics and glass. If those living in developed nations and major cities wish to maintain their high-consumption, high-mobility lifestyles, the 'green' transition will require more mineral resource extraction than ever before, not only lithium, but also nickel, copper, rare earth minerals, cobalt and many others (cf. Sovacool et al., 2020). With an eye on this emerging opportunity, the Bolivian government of Evo Morales decided to invest in an ambitious effort to establish a national lithium extraction industry.

Lithium extraction in Bolivia is focused on the Uyuni salt flat in the southwest of the country, which is part of the Andean plateau. This plateau also covers parts of Argentina and Chile, and is often referred to as the 'lithium triangle', as it boasts abundant lithium deposits, which are primarily found in the brine of the salt flats. The Uyuni salt flat is the largest in the world, covering an expansive 10,500 km^2s. The region is characterised by cold temperatures, high altitudes, intense solar radiation, saline soils and an arid climate, which pose challenges for local agriculture (primarily focused on quinoa and potatoes). The region is also rich in metals and minerals (silver, zinc, lead, tin and copper, as well as lithium), with extensive mining activities serving as the primary source of employment and economic sustenance for the local population since colonial times (Perreault, 2017a; 2017b).

In this article, we focus on the period of Evo Morales' presidency

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(2006–2019) in assessing people's perceptions of lithium extraction in the region around the Uyuni salt flat. Morales' presidency was characterised by shifting strategies and an evolving politico-economic context, during which 'resource nationalism' became a strong central discourse. In the 2000s, Morales embodied the idea of securing greater national wealth from foreign-operated mineral exploitation and the nationalisation of crucial industrial sectors, such as mining and gas extraction, for the benefit of the people. The government presented lithium extraction as a 'clean' and 'future-oriented' activity, distinct from conventional mining practices in the country, which were associated with negative environmental impacts, dangerous working conditions and foreign exploitation during the colonial and neoliberal eras.

Our research explores the way in which public perceptions of the Bolivian lithium project and of Morales himself evolved over the course of his three terms in power. When fieldwork for this article was undertaken in 2019, people living in the greater region of the Uyuni salt flat continued to believe in the 'future-orientation' of the lithium industry, and that it was the cleanest form of mineral extraction to date, despite evidence to challenge these perceptions. However, Morales's government had by that time lost the people's trust, proving to be incapable of fulfilling the promises that had been made in relation to lithium extraction, as material benefits had not materialised for the region by 2019, thirteen years after Morales had come to power.

In the following section, we describe our methodology. In Section 3 we present the theoretical framework and literature review. Section 4 provides a background to lithium extraction in Bolivia. We present our qualitative data and secondary information in Section 5, and our results are presented in the conclusion (Section 6).

2. Methodology

This research is based on ethnographic fieldwork, which was conducted by the first author in Bolivia in February and March 2019. Fieldwork was mainly conducted in the three large urban centres in the Bolivian highlands: Potosí, Oruro and Uyuni. Oruro is one of the most important mining cities in Bolivia (silver, tin, copper) and lies to the north of the Uyuni salt flat; Potosí is the capital of the department (or province) that includes the Uyuni salt flat; and Uyuni is the closest city, from which the salt flat takes its name. These cities were chosen for their importance to both conventional mining activities and lithium extraction. The cities are mostly inhabited by low- and middle-working classes – mostly related to mining – and people of Indigenous background. This is very different from the bigger, more socially stratified Bolivian cities, such as La Paz, Cochabamba and Santa Cruz de la Sierra. Visits were also made to La Paz, Sucre and Llipi (the site of a lithium extraction plant) to conduct semi-structured interviews with representatives of the national lithium company YLB (*Yacimientos de Litio Bolivianos* or Bolivian Lithium Deposits), political activists and experts.

A total of nineteen semi-structured interviews and twenty-six informal conversations were carried out during the fieldwork. The interviews and conversations were held with a range of respondents, including: urban residents (miners and former miners, tourist guides, local hostel owners, market vendors, university students, cooks, housewives), private-sector and state experts related to the lithium industry (YLB employees, chemical engineers, a socio-environmentalist, a representative of the Ministry of Energy and Technology), and representatives of civil society (members of NGOs, a social anthropologist, a member of the Potosí city committee, political activists and a former government employee). In addition, secondary sources, such as national newspapers, television programmes, YouTube videocasts and scholarly literature, served to deepen our understanding of the political and societal context.

3. Literature review

In recent years, numerous authors from different disciplines have engaged with lithium dynamics, seeking to unravel the complex interplay of factors that influence discourses and practices at the global and national levels, particularly in those regions where lithium is extracted. Some scholars observe that discourses generated in the global North relating to the energy transition and electromobility have tended to positively frame the lithium extraction process, which encompasses questions of sustainability and justice, including in relation to its environmental impact (Sérandour, 2017; Forget and Bos, 2022; Jerez et al., 2021). The increasing global demand for mineral resources raises an ethical question about the justification of exploiting lithium and other minerals for technological advancement and sustainability, given the socio-environmental costs associated with their extraction (Köppel and Scoville-Simonds, 2024). Additionally, the COVID-19 pandemic further accelerated transformation in the geopolitical and technological dimensions of the lithium deposits in South America, intensifying debates on the pressure from the Global North to de-carbonize the energy sector (Fornillo and Lampis, 2023). Similarly, in their discussion of large-scale resource extraction in Argentina (lithium mining and soy agribusiness), Dorn et al. (2022) argue that these practices have been reframed as essential to addressing climate change, consequently serving as a justification for negative socio-ecological impacts. Studies conducted in Bolivia on environmental impacts and transparency in relation to lithium mining (Ströbele-Gregor, 2012; Calla Ortega, 2014; Romero Valenzuela, 2020) have raised concerns about the accessibility of environmental information relating to this industry. There are concerns that a lack of such information could further exacerbate social inequalities (Diaz-Cuellar, 2017; Clavijo et al., 2022), which, in turn, could undermine the prospects of achieving a fair and equitable energy transition.

Natural resources in capitalist societies are conceived as commodities, owing to their capacity to be exchanged on the global market, yet the key to their existence as things of value for humans is the result of the complex evolution of symbolic, social, political and economic meanings, understood or perceived at a specific point in time and space (Kopytoff, 1986; Baviskar, 2003; Bridge, 2009). From a capitalist perspective, natural resources may appear naturally 'given' and ready for human use, a perspective that neglects the relevance of their symbolic meaning and in particular the non-monetary value that many people attach to them (cf. Taussig, 1980; Nash, 1993; Richardson and Weszkalnys, 2014). Studies of resource extraction in Bolivia highlight the distinctive and foundational role that lithium and other natural resources play within Bolivian culture, collective consciousness and memories, which are shaped by both colonial and neoliberal legacies (Revette, 2017; Perrault, 2017a; Sanchez-Lopez, 2019b).Perrault (2017a) especially analyses the connection between mining and memories in Bolivia, and the way mining is collectively remembered (including through statues, monuments and festivities) becoming part of the national identity. Molina (2009) argues that Bolivians see natural resources as a part of nature that goes beyond physical materiality, creating a sense of national pride and the expectation that the resources can solve the country's economic problems.

Bridge (2009) argues that the value of a resource can be acquired or destroyed in a given moment in time. "Resources are not; they become", according to the famous quote from resource economist Erich Zimmermann (1933:3 cited in: Bridge, 2009). In a global context, we consider lithium to be a natural resource whose value has increased as a result of social and technological change. In South America, Barandiarán (2019) argues that technological changes introduced in response to the identified needs of the green transition have triggered a vision of lithium as the subject of a socio-technical imaginary. This imaginary highlights the importance given to science and technology by political leaders, as they deploy these advancements to project a vision of a desirable future society, breaking away from past development models (ibid).

Social and symbolic meanings of lithium have changed over time, as Köppel (2020) explores in his 'unfinished story' of this mineral that is "constantly subject to intense transformations" (ibid: 9). In this context of transformation, the questions of value and scarcity associated with

this resource, and the water consumption required for its extraction, are also subject to change (e.g., Babidge, 2015; Sanchez-Lopez, 2019a; Köppel, 2020). Revette (2017) investigates the everyday experiences related to lithium extraction in Bolivia, examining how individuals attempt to reconcile their expectations with the historical and cultural significance of mining, as well as the tangible impact that even small changes have on people's lives. Ultimately, she argues that local interpretations of natural resource extraction at a given time are shaped by the way in which the past is remembered and the future envisioned (ibid).

In social studies on memory, Émile Durkheim (1971[1912]) and later his colleague Maurice Halbwachs (1992 [1950]) introduced collective social aspects in memory studies. Halbwachs argued that certain memories are the result of a social process that is connected to a collective identity, and they serve to create group cohesion and a sense of belonging. We refer to collective memory as the recollection of events from a group perspective, encompassing forgetting as much as remembering (Halbwachs, 1992 [1950]; Legg, 2007; Perreault, 2017a). According to Legg (2007), collective memory depends not only on the ability to recall past events, but also on institutional memory, as the past is constructed to justify the present order (see also Molden, 2016). In the context of the way in which the extraction of natural resources in Bolivia was remembered, especially in the early Morales era, this can be linked not only to the colonial past of resource exploitation, but also to more contemporary conflicts, such as *la guerra del agua* (the water war of 2000, triggered by water privatisation and a sharp increase in water prices in Cochabamba) and *la guerra del gas* (the gas war of 2003, against the government's 'extractivist' gas policy, which was seen as favouring foreign interests) (see Perreault, 2006).

An important element of Morales' propaganda was the national consensus around the lithium project. This aspect was examined by Sérandour (2017), who studied the connections between the sense of national pride associated with natural resources, particularly lithium, and the political propaganda promoted by Morales during his three presidential terms. Sérandour observes that, remarkably, this consensus remained relevant even several years after the launch of the lithium project, despite the fact that initial promises had not been fulfilled (ibid). The Morales propaganda aimed to build a sense of national ownership over lithium, emphasising the benefits that it could bring to the people, while downplaying the environmental risks likely to hinder the development of the project (Calla Ortega, 2014).

Studies on lithium extraction in Bolivia point to a lack of transparency in the project's classification as a minor mineral extraction activity without adequate scientific analysis (Romero Valenzuela, 2020; Sanchez-Lopez, 2019a). Transparency around environmental risks and concerns is essential to environmental protection, and public health and security. Openness about environmental risks and the consequences of industrial activities is also essential to prevent or mitigate social inequality. This can range from enabling or negatively impacting small and medium local businesses (from agriculture to tourism) to the availability of potable water. On a broader scale, the Morales government's strategic and intentional neglect of environmental reporting undermined notions of fairness and equity outlined in international policies for the global energy transition (Ströbele-Gregor, 2012; Calla Ortega, 2014; Romero Valenzuela, 2020).

In this study, we consider lithium extraction and the central role of the Morales government, supported by the national media, in creating a narrative that intentionally distanced lithium from memories of past resource exploitation. Interviews during fieldwork revealed a dissociation between lithium extraction and past mining experiences, which led us to refer to public perceptions of lithium extraction as being 'future-oriented'. In this context, the term 'future-oriented' evokes a departure from colonial and neoliberal patterns of resource extraction, whereby foreign interests exploited Bolivia's resources without substantial benefits for the local population. The term embodies the promise of a decolonial future in which industrial production of lithium generates national and regional wealth, imagining Bolivia as a modern and industrialised country (Barandiarán, 2019).

Particularly at the beginning of his mandate, Morales used a political and economic strategy based on 'resource nationalism' (Gudynas, 2016b; Obaya, 2021), which, according to Haslam and Heidrich (2016:1) is defined as, "a wide range of actions and policies through which the state seeks to enhance its influence over development of the resource sector". We see lithium as an example of a natural resource that acquired political value in Bolivia by being placed at the forefront of a political strategy that conceived of natural resources as the property of the people, with the state acting as a governor for the good of its citizens (Gudynas, 2016b; Haslam and Heidrich, 2016). In Bolivia, this ideology was a reaction to past and present experiences of loss and exploitation (Molina, 2009; Kohl and Farthing, 2012). Bolivia's national project of lithium extraction and its wider strategy of resource nationalism operated at multiple scales – local, national and international (Bos and Forget, 2021). The phenomenon of exploiting large quantities of unprocessed natural resources for export, is known as 'extractivism', and has significantly influenced the political and economic strategies of Latin American countries over the past century (Gudynas, 2009; Acosta, 2013; Kaup, 2014; Svampa, 2015). Ultimately, these experiences have inevitably shaped Bolivians' understanding of extractive activities and their impacts, e.g., redistribution of royalties, environmental impacts and employment (Perreault, 2017b).

Public perceptions of lithium extraction have also been influenced by what we call the 'materialities of lithium'. Drawing on the concept of 'resource materialities' (Richardson and Weszkalnys, 2014), we emphasise the convergence of knowledge, physical and chemical qualities, infrastructure, political and economic strategies, and social experiences related to lithium throughout its extraction, processing and consumption as a resource. Lithium's specific physical and chemical properties, including its extraction and separation processes, play a significant role in shaping the public narrative about the lithium industry and conferring social, economic and political significance. Indeed, our decision to refer to the Bolivian lithium project as 'extraction' rather than 'mining' stems from the distinct methods employed for lithium extraction compared to other mineral projects in Bolivia. The concept of 'lithium materialities', however, also extends beyond its mere physical and chemical attributes. Social, political, economic and symbolic significance are inherent to any natural resource (Bridge, 2009). Thus, when we refer to the materialities of lithium, we understand not only its physical, but also its social characteristics.

A prior investigation focusing on the materialities of the Uyuni salt flat, conducted by Sanchez-Lopez (2019a), contended that the values and symbolic meanings attributed to the salt flat have undergone a transformation over time. It transitioned from being regarded as a worthless desert to becoming valuable land. For local Indigenous communities, the salt flat, known as *Salar de Tunupa* – named after the dormant volcano situated in its northern region – carries spiritual significance. According to local legend, this spiritual value accounts for the land's infertility for agricultural purposes. Sanchez-Lopez (2019a) demonstrated that traditionally, local communities engaged in the extraction and trade of salt from the area. It was only with the emergence of the tourism industry in Uyuni and the development of the existing ulexite industry (primarily for the manufacture of fertiliser), that the perception and value of the region underwent a significant transformation. Consequently, various material aspects of the salt flat, such as its landscape and the presence of ulexite, played a pivotal role in shaping new social dynamics within the communities of the south-western Potosí region (Sanchez-Lopez, 2019a).

4. The Bolivian lithium project and its constraints

The political landscape of Bolivia has historically been influenced by the exploitation and governance of natural resources. Along with other Latin American countries, Bolivia underwent an extended period of

neoliberal policies spanning 1985 to 2006, which primarily served a political elite without bringing real benefits to the country (World Bank, 2022). The pivotal shift came with the 2006 presidential elections, when Evo Morales assumed office as Bolivia's first Indigenous president. Leading the *Movimiento al Socialismo* (MAS) party, Morales was integral to the broader South American 'left turn' movement, which actively opposed conservative and neoliberal policies, advocating a development paradigm centred on enhancing citizens' quality of life and mitigating poverty (Gudynas, 2009; Escobar, 2010; Svampa, 2015; Veltmeyer, 2015). See Fig. 1 for milestones of lithium extraction in the Uyuni salt flat.

When Morales came to power, he aimed to implement a comprehensive political, cultural, and economic transformation in Bolivia, which he called *'proceso de cambio'* (process of change), prioritising Indigenous values over profit-driven Western capitalism (Pellegrini, 2016). The government focused on nationalising the extraction of natural resources, asserting that it would promote collective welfare, a strategy which contrasted markedly with the previous decades of neoliberal governments (Molina, 2009; Kohl and Farthing, 2012). The nationalisation of natural resources included the renegotiation of existing contracts with international companies and the (re)creation of state-owned enterprises. At a national level, lithium therefore assumed political prominence at the heart of a wider discourse of 'resource nationalism', which served to legitimise the country's economic development based on the extraction of large quantities of unprocessed natural resources (Haslam and Heidrich, 2016).

The plan to extract lithium from the Uyuni salt flat was first tabled in the 1980s and revived by the Morales government after his re-election in 2008 with the "National Strategy for the Industrialisation of Evaporite Resources" (Decree, 2008). This strategy classified lithium as an evaporite resource, mainly because of its extraction process, and it was declared to be of strategic importance for the country's development (Calla Ortega et al., 2014). This was followed by a declaration of state control over all Bolivian natural resources in the new Constitution of 2009 (Perotti and Coviello, 2015). Lithium industrialisation thus became an important political communication tool to frame the narrative of resource nationalism in Bolivia, while the nationalisation of the media emerged as a key strategy in shaping public perceptions of lithium extraction.

Decree No. 29,496 marked the beginning of the industrialisation of evaporite resources in Bolivia, led by a new government agency, the National Directorate of Evaporite Resources, (DNRE or *Dirección*

Key milestones of lithium extraction in the Uyuni salt flat

1990s

- Bolivian government negotiations with transnational company Lithium Corporation of America (FMC LITHCO)
- First stipulation of a 40-year renewable contract for the extraction of raw materials (brine) from the Uyuni salt flat
- Contract terminated by the president following local protests
- Further industrialisation activities on the Uyuni salt flat stopped

2006 - 2010

- 2006: Evo Morales elected as president of Bolivia
- 2007: Decree No. 29117 establishes the Fiscal Mining Reserve covering the entire national territory and all natural resources, including evaporite resources. The state is the owner of the Fiscal Reserve which is under the administration and exploitation authority of the state-owned mining company COMIBOL.
- 2008: Decree No. 29496 (1 April 2008), establishes the National Directorate of Evaporite Resources, (DNRE or *Dirección Nacional de Recursos Evaporíticos*)
- 2008: State-owned corporation COMIBOL, through the DNRE, starts the implementation of the national strategy for exploration, exploitation and industrialisation of the evaporitic resources in the Uyuni salt flat
- 2008: Start of civil works in Llipi
- 2009: New Constitution of the Plurinational State of Bolivia declares that all natural resources are strategic, their extraction is a national priority (Art. 348) and the state has control over them (Art. 349, 351)
- 2010: Decree No. 4366, DNRE changes its name to National Evaporite Resources Management (GNRE or *Gerencia Nacional de Recursos Evaporíticos)*

2012- 2017

- 2012: Start of construction of the semi-industrial plant for the production of potassium chloride in Llipi
- 2013: Start of the construction of the lithium carbonate pilot plant in Llipi
- 2015: GNRE and China Camc Engineering Co. sign a contract for the construction of the industrial plant of potassium chloride
- 2015: GNRE signs a contract with the German company K-Utec Technology for the elaboration of the final engineering project for the lithium carbonate industrial plant
- 2016: Symbolic export of the first tonnes of lithium carbonate to China
- 2017: New state-owned company YLB founded, replacing GNRE; YLB reports to the Ministry of Energy and manages all activities related to evaporitic resource development (prospecting, exploration, extraction) COMIBOL ceases to operate in the Uyuni salt flat (continuing operations in other Bolivian mines)

Fig. 1. Milestones of lithium extraction in the Uyuni salt flat. Sources: US Department of the Interior, 1995; GNRE, 2010, 2011, 2012, 2013, 2014, 2016; Kohl, 1991, 1992; YLB, 2017.

Nacional de Recursos Evaporíticos), which in 2010 changed its name to National Evaporite Resources Management (GNRE or *Gerencia Nacional de Recursos Evaporíticos*). The responsibility for developing a lithium industry in the Uyuni salt flat rested with COMIBOL (*Corporación Minera de Bolivia* or Bolivian Mining Corp.), a government-owned corporation. GNRE operated under COMIBOL until mid-2017, with COMIBOL reporting to the Ministry of Mining and Metallurgy (Mazumdaru, 2017; YLB, 2021). GNRE was subsequently replaced by YLB, the new state-owned company responsible for lithium industrialisation. YLB reported to the Ministry of Energy and Technology and was tasked with promoting the nation's lithium deposits and managing all activities related to evaporite resource development, including exploration, prospecting and extraction (Fong-Sam, 2023).

The initial phase of the lithium project began in 2008 and involved constructing a pilot extraction plant in Llipi, with pools for solar evaporation, in the southwestern part of the Uyuni salt flat. The lithium separation process starts with brine pumping: the brine is drawn from a depth of 50 m and poured into tanks on the surface of the salt flat. Through solar evaporation, the metals and minerals are initially separated out, and the brine is then pumped into other, gradually smaller pools to obtain a purer compound of minerals with a higher concentration of lithium carbonate [interview with YLB engineers, 29.03.2019]. The eleven rows of evaporation pools in operation prior to 2020 were completed during the Morales administration. At the time of the fieldwork for this article, in 2019, there were 8 rows (YLB, 2019, 2020).

The Uyuni salt flat presents several challenges and complexities for lithium extraction, which set it apart from neighbouring salt flats in Chile and Argentina, ultimately increasing production costs. The geographical location of the Uyuni salt flat in the highlands, more than 3500 m above sea level, poses logistical challenges. The region lacks the necessary infrastructure and direct access to the sea, which is crucial for shipping, making it less competitive than Chilean lithium production. (Bolivian lithium carbonate is shipped from Chilean ports.) Heavy rainfall from January to March, unlike the arid Atacama Desert, slows down the evaporation process, reducing production for nearly three months every year.

The Uyuni lithium itself has specific characteristics. It is found in compounds with a notably high magnesium content, three times higher than in Chile's Atacama Desert and eighteen times more than in Argentina's Salar del Hombre Muerto (Lucrecia López Steinmetz and Salvi, 2021). This magnesium abundance has significant implications for the material composition of the brine in the Uyuni salt flat and profoundly influences the choice of technology to be used, production costs and the environmental consequences associated with production decisions (Sanchez-Lopez, 2019a; Hancock et al., 2017b; Calle Ortega, 2014). Bolivia decided to adopt the technology used already in Chile and Argentina (evaporation pools) for the process of separation, despite the different composition of the brine (Calla Ortega, 2014). This requires the addition of large quantities of quicklime, resulting in a significant volume of waste by-products (or residual material) (Sanchez-Lopez, 2019a). According to Calla Ortega (2014) the specific technology used in Llipi in the initial evaporation phase could yield four times the volume of residual material compared to the quantity of lithium carbonate produced. The resulting sludge contains a high concentration of magnesium and poses significant toxicity risks to the local flora and fauna, potentially altering soil alkalinity and thereby adversely affecting quinoa cultivation and local biodiversity (Calla Ortega, 2014). Romero Valenzuela (2020) and Sanchez-Lopez (2019a) also highlight concerns about the return of residual material, with high levels of potentially toxic magnesium, from the evaporation process to the salt flat without proper processing.

Water availability is a significant concern in the Uyuni region, as water resources are also essential for the local quinoa cultivation, an activity that also contributes to cumulative environmental impacts in the region, as high levels of water use alter soil alkalinity and affect biodiversity in the region (Geerts et al., 2006; Perreault, 2013). Sérandour (2017) revealed that these cumulative impacts were downplayed by the government, despite evidence to the contrary in the annual reports of GNRE and YLB.

A key challenge has been Bolivia's lack of technological expertise in evaporative extraction (Hancock, 2017a), which has required the strategic involvement of foreign resources and expertise. Since 2017, the government has moved from a radical stance on resource nationalism to a more moderate one, seeking partnerships with international firms (Obaya, 2021). Concurrently with the initial lithium industrialisation strategy, Morales' government established partnerships with various entities, including the University of Freiburg in Germany, private investors in China, South Korea and Japan, and the governments of Iran, Brazil, South Korea and Russia (Ströbele-Gregor, 2012). These collaborations were aimed at supporting the development of the necessary infrastructure and acquiring the technical expertise necessary for lithium refining and battery manufacture. In August 2016, a shipment of 10 tons of lithium carbonate was exported to China, which was a symbolic gesture of future export plans (Hancock, 2017a). However, the Morales government position was always that the objective of the lithium project was to generate wealth for the country and local regions, not for foreign investors.

At the time of fieldwork in early 2019, the construction of a larger industrial-scale plant dedicated to producing lithium carbonate was underway. This project stemmed from GNRE's 2015 contract with the German company K-Utec Technology. The new facility was being developed using the insights gained from the pilot plant. Concurrently, in 2015, GNRE had also contracted China Camc Engineering Co. for the construction of a potassium chloride industrial plant. By the time of the fieldwork, this industrial-scale plant was already operational.

According to interviews with experts in 2019, the industrial plant was expected to produce up to 30,000 t of lithium carbonate per month. The 2020 YLB annual report, however, states that the plant produced a total of 201 tonnes of lithium carbonate in 2019, averaging 39 tonnes per month, excluding the non-production months during the rainy season (YLB, 2020). This was a lot less than had been predicted. In 2019, the project was also moving towards the final phase of the project, to construction of a plant in La Palca, in the Potosí department, for the production of batteries. In this last phase, foreign investors would be brought in. These developments marked a departure from Morales' initial resource-nationalism strategy, which had boosted his popularity in 2005 and during his first and second terms (Hollender and Schultz, 2010).

While lying outside the scope of our analysis, it is worth briefly mentioning the period that came after the end of Evo Morales' time in office. After October 2019, Bolivia faced political instability following the presidential election that saw Morales flee the country, leaving a political vacuum. During this period, a transitional government took power, representing a stark contrast to the previous one. The 2020 presidential elections saw Luis Arce, a member of Evo Morales' political party MAS, become the new president of Bolivia, and the country regained a certain political stability. Despite the disruptions caused by the power transition and the global COVID-19 pandemic, the administration of the lithium company YLB has not undergone major changes since 2019, while lithium carbonate production in the southern region of the Uyuni salt flat and its industrial expansion in other areas around the salt flat have so far continued (YLB, 2020; 2021).

5. Factors influencing local perceptions of lithium extraction

In this section, we explore in more detail the factors influencing the perceptions of lithium extraction held by the people living in the region around the Uyuni salt flat. We focus in particular on the public project of lithium industrialisation and the nationalisation of the media (a key communication channel for government messaging on lithium); and the selective coverage of environmental issues in government

communications, which led to a surprising lack of awareness about the environmental impacts of lithium extraction amongst local people, who nonetheless had significant environmental concerns about conventional mining in the same region. We also reflect on factors influencing the shift in people's perceptions of Morales himself and his ability to deliver on the promises he had made about lithium industrialisation.

5.1. The national lithium project and the nationalised media

Lithium's re-categorisation as an 'evaporite' resource and the decision to completely restructure the governance of lithium in 2017 by creating YLB (see Section 4) support the argument that the Bolivian state constructed a specific image of lithium, distinct from other minerals (Bos and Forget, 2021). Conversations held in 2019 with industry workers and ordinary residents of the Uyuni region consistently reflected a common narrative surrounding the lithium plant. The government ideology was clearly reflected in discussions with YLB engineers during a visit to the lithium plant in Llipi in 2019. On many occasions, the engineers showed their pride in the nationalisation of lithium and the wealth of their land, as the following comment shows:

The lithium is ours; we industrialise it on our own. […] [In 1992] there was a foreigner meddling [referring to a US foreign company]. They always consider themselves owners of the natural resources of the planet. They consider South America to be theirs. But it is not like this, every country is sovereign and autonomous. […] We have secured here the future of the world in terms of lithium. We are the target of every country and investor [interview, 29.03.2019].

The state played a central role not only in the creation of the lithium industry and its governance, but also in actively shaping a distinct public perception of it through the nationalised media. Morales pursued two significant measures to nationalise the media. Firstly, in 2008, he reclaimed the national telecommunications firm, ENTEL (*Empresa Nacional de Telecomunicaciones* or National Company of Telecommunications). ENTEL was originally established in 1965 and had been partially privatised in 1995. Secondly, in December 2013, Morales launched the Túpac Katari 1 (TKSat 1) communications satellite into orbit, extending broadcasting and communications services to a broader population segment that was previously underserved. This satellite bore the name of a national hero, symbolising restored national pride and self-determination against foreign influences.

While the investment in telecommunications brought undeniable benefits to the people, the updated media and communications system also served as a potent tool for government messaging. This became evident during fieldwork in discussions with a local anthropologist and NGO workers, as well as through monitoring the national media while being there. In national newspapers, on television broadcasts, and on billboards posted along major roadways, Evo Morales often appeared in traditional Indigenous clothing, accompanied by catchy slogans emphasising his commitment to the welfare of Bolivia and its people. During an interview with a local anthropologist working with an NGO in Oruro supporting communities impacted by mining activities, the anthropologist asserted that lithium constituted a component of a broader national propaganda strategy under the Morales government.

They don't need to hide anything, they don't need to disguise anything, because this [lithium extraction project] is presented as a propaganda of how Bolivia can be converted into a lithium producer and has to take advantage of its resources. [interview, 6.03.2019].

Even those people living closest to the lithium plant in Llipi relied solely on the national media for information, as the plant is situated in a remote and restricted area, only accessible with permission from YLB's office in La Paz. The Llipi site was enclosed by a military-guarded perimeter, preventing direct interaction between local communities and the plant or YLB employees residing in the Llipi compound. Consequently, the people living in the region lacked first-hand observation of, and exposure to, lithium extraction, and could only rely on information channelled through the government-controlled media. The national media selectively emphasised specific aspects of the lithium project while omitting others. The effective of this was particularly noticeable in relation to the environmental impacts of lithium extraction, which we cover in the next section.

5.2. Fragmented environmental awareness

As observed by Sérandour (2017), the Morales government's public communication campaign around lithium omitted to a large extent the environmental risks that had been articulated in technical impact studies commissioned by GNRE and YLB. As a consequence, these insights were notably absent from discussions with local people in 2019. None of the conversations about lithium reflected the concerns typically associated with mining experiences. Only very few people expressed concerns regarding water supply or environmental impacts related to the lithium industry. Yet the same people made frequent references to the environmental impacts of conventional mining activities in the same region.

The public perception of lithium extraction as a clean activity first became apparent during the first author's initial stay in Uyuni. The first week was spent at a family-run hotel situated at the heart of the town. This hotel, the city's oldest, had a large open-air atrium surrounded by rooms facing semi-open corridors. The first author spent time in a glass-enclosed room that contained the reception, as well as tables and sofas. She used this room, especially in the evenings and between interviews, to take breaks and note down her observations, while keeping an eye on the news from the television in the room and observing the family at the reception, especially an elderly man in his seventies who spent most of his time there.

One evening the elderly man and his son were discussing a water shortage in the hotel showers. The son was concerned about the situation, as they had to close down some of the showers. The following day, while watching a news report on lithium, the first author engaged in a conversation with the elderly man. He blamed the shortage of water in the region on the San Cristobal mine, an open-pit silver, lead and zinc mine in Potosí Province. He revealed that he had spent his entire life in Uyuni, but had limited knowledge of lithium, apart from what he saw on television, particularly the image of the evaporation pools. He stated that he was not worried about the lithium industry, because it seemed to him to be a cleaner industry than the other mines in the region and that he therefore expected a minor impact. He never once associated lithium extraction with any potential threat to the region's water resources, despite his clear concerns regarding the San Cristobal mine.

In the region around the Uyuni salt flat, extensive conventional mining activities, dating back to colonial times, have not only shaped the region's economic landscape but also left a significant environmental impact, which remains in the collective memory. Even in contemporary mining projects, contamination and water scarcity remain substantial issues, particularly in the Oruro and Potosí regions, where the highland climate already posed challenges for agriculture. Inhabitants in these regions have faced increasing water scarcity in the past decade, a factor that is central to the conflict between mining and agriculture activities in the Bolivian highlands (Perrault, 2017b). Mining consumes significantly more water than the semi-arid agriculture practised in these areas. For example, the Huanuni underground tin mine in the Oruro region (nationalised in 2006) consumes over 28 million litres of water per day (Andreucci and Radhuber, 2015), while the (transnational) San Cristobal mine uses over 45 million litres per day (Perreault, 2017a: 232). These high levels of water consumption leave communities with insufficient water for crop irrigation, and damage to lakes in the region: by 2016, for instance, Lake Poopó downstream from the Huanuni mine had completely dried up (Perreault, 2013). As a result of this historic and recent experience, concern about water scarcity due to conventional mining was often expressed by local residents in all three cities in interviews and discussions in 2019.

Cerro Rico ('Rich Mountain') is a mountain whose silver deposits

generated huge wealth for Spain's colonial empire, making Potosí at the foot of the mountain the world's largest industrial centre in the 16th century (Brown, 2012; Baragan and Zagalsky, 2023). The Cerro Rico mine is still being mined at a small scale – less for silver, more for tin, lead and zinc – by local miners, working in dangerous and unhealthy conditions (Medium, 2019). Interviews in 2019 revealed that the impacts of conventional mining on water, people and the environment are experienced in various ways and are reflected in people's daily conversations (in line with Perreault, 2017a). The following comment, made by a former miner while standing next to a small river close to the Cerro Rico mine at Potosí in 2019, is an example of the way in which people associated more traditional forms of mining with significant environmental risks:

> *The water here is poison, don't drink it! […] The mine [Cerro Rico] has existed since colonial times, but it's only in the past few years that the situation got worse. Now we cannot drink tap water anymore, because the potable water contained in the pools [of the hydraulic system] made by the Spanish, passes now through the mine before reaching the city*. [Interview, 10.03.2019]

Another interviewee in Uyuni, who was a member of the town committee of Potosí, commented on the situation with the San Cristobal mine in these terms:

> *The exploitation of the resources in San Cristobal is something terrible. It is terrible. They use almost 50,000 m^3 of water. They use it, pollute it, and give it back. It affects here as well. There are many things … yes, they have excellent reports, everything is very well done, but ask how? And if I want to verify it? I cannot because I don't have the equipment.* [interview, 28.03.2019]

Given that people are so concerned about the environmental impacts of conventional mining, it is remarkable that they should be so unconcerned about the environmental impacts of lithium extraction. Previous studies on lithium extraction in Bolivia have indicated a deliberate lack of transparency around environmental issues on the part of the government, including the project's classification as a 'minor' extraction activity, and a lack of reporting on specific technologies used and issues relating to toxic waste management (Calla Ortega, 2014; Romero Valenzuela, 2020; Sanchez-Lopez, 2019a) (see Section 3). This was confirmed in 2019, in an interview with a socio-environmentalist working for a private waste disposal company in Llipi. He disclosed that he had raised environmental concerns during his visit to Llipi with YLB engineers, specifically regarding the residual material generated by the plant (see Section 4). However, he received no comprehensive response from YLB and felt constrained from further raising concerns to safeguard his job (conversation, 27.03.2019). Similar constraints were also evident in conversations with YLB and state representatives. During the first author's visit to the Llipi plant, a YLB employee avoided answering questions about the amount of water needed for the extraction and industrialization processes. A chemical engineer also described the lithium separation process as 'natural', emphasising solar evaporation and failing to mention the chemical reactions involved [conversations, 29.03.2019].

In 2019, local people frequently made reference to aspects of lithium extraction that they had observed on the television and via other media. It became evident that interviewees tended to connect the white salt crust seen on the salt flats with lithium itself, considering lithium to be one of the various types of salts (*sales*) within the salt flat, all characterised by their whiteness. This perception was akin to the above-mentioned conversation with the hotel receptionist in Uyuni, as it extended to the evaporation pools. In informal conversations with other local people, it became clear that they viewed the evaporation pools as more environmentally friendly than other mining activities. This was further reinforced by the belief that the process of lithium extraction stood in stark contrast to the collective memory that local people had of mining, and how they talked about it, including past and present experiences.

None of the conversations with local interviewees addressed the technical challenges, constraints, or potential environmental risks associated with the lithium extraction process, nor did they discuss these issues as they pertain to the subsequent stages and battery production (see Section 4). The predominant environmental concern revolved around the potential disturbance to the crust of the Uyuni salt flat. Notably, this concern resonated prominently with tourist agencies in Uyuni. Through extensive conversations, it became evident that their concerns were linked to the construction of the evaporation pools on the surface of the salt flat, which alters the pristine, white landscape that draws tourists every day. This concern was clearly expressed in the following excerpt from an interview with a tourist agent in Uyuni:

> *It could be that it is good for the economy of the country, but not for us. We live from tourism, and we are worried that the salt flat could be ruined. They [state representatives] said that they will only extract in the southern part, that lithium is contained only there and not in the whole salt flat. That is what they told us, but there isn't exact info. […] We speak about this [possible destruction of the salt flat] only between us, not outside. It is more of a concern.* [interview, 25.03.2019]

Yet despite widespread apprehension about water scarcity in the region arising from other mining activities, local respondents in the fieldwork interviews did not directly link lithium extraction to substantial water usage due to lithium's natural presence in water. When asked about the water requirements for the lithium plant, respondents even found this question surprising and indicated that they had no knowledge about the water consumption for lithium extraction, as the following quote shows:

> *Yes, we don't have much water here. I don't know (silence). Mm … where are they [the lithium plant] getting the water from?* [Interview, 25.03.2019]

Such reactions indicate that, despite their existing concerns about water scarcity in the region, specifically relating to the activities of conventional mines, these people had not previously contemplated the current or future water demands associated with the lithium plant.

5.3. Unfulfilled promises

The public narrative around lithium emphasised Bolivia's possession of the world's largest lithium deposit, which had the potential to deliver wealth to the country and the region around the Uyuni salt flat. Expressions such as "We have the future of the world assured" [conversation, 29.03.2019] were used by local people in 2019 when referring to the prospects represented by lithium. However, interview and conversation partners, especially in Uyuni and Potosí, had by that time developed a deep mistrust in the government's ability to deliver on Morales' promises related to the lithium industry. This sentiment was echoed in many interviews, even though people still believed in the economic potential of the industry.

> In the 2000s, Evo Morales embodied the notion of 'resource nationalism' which was promoted in his public communication campaigns. In 2019, over a decade since the start of the lithium project, there were considerable amounts of scepticism from local residents for two key reasons. First, from their direct experience, they could see that Morales' promises at the start of his presidency – relating to lithium production and associated benefits for people in the region – were not being fulfilled, despite the government propaganda. This is reflected in a comment from an NGO worker in Potosí:
>
> *The country improves when the situation in which one lives improves, and not because a commercial on television says so. There isn't economic stability as they say on television.* [interview, 11.03.2019]

Second, people were becoming more aware of the increasing foreign influence in the development of the project, particularly from China. The full-scale lithium and potassium chloride plants that were under construction in 2019 were being built by Chinese and German companies, and it was becoming apparent that foreign investors would be brought in to deliver the final phase of the project – the construction of the battery plant. This was seen as a departure from Morales' original resource-nationalism strategy.

The prevailing sense of mistrust was compounded by various scandals involving corruption and mismanagement of resources. These included the TIPNIS conflict of 2010, which centred on a proposed road through the Isiboro Sécure Indigenous Territory and National Park (TIPNIS) and the lack of prior consultation with local Indigenous groups (McNeish, 2013); and the corruption scandal around the *Fondo Indigena* (Indigenous Fund), in which MAS representatives embezzled funds that had been allocated for rural development projects (CNN, 2015). These two scandals had a significant impact on Evo Morales' reputation, highlighting a contradiction in his government's political stance.

These factors contributed to a widespread feeling of mistrust in lithium governance. People living in the greater region of the Uyuni salt flat continued to believe in the future orientation of the lithium industry and in lithium extraction being cleaner than other types of mining. However, by 2019, the Morales government had lost the people's trust. Indeed, 2019 was the year when Evo Morales ultimately fled the country, 13 years after coming into power.

6. Conclusion

The primary aim of this paper, focusing on lithium extraction in Bolivia during Evo Morales' presidency (2006–2019), was to explore the way in which the public information campaign of the Morales government – based on an ideology of 'resource nationalism' and promoted through the nationalised media – shaped the social, political, symbolic and economic significance of lithium in Bolivia. Lithium became a resource of strategic significance through the manifold meanings and affordances that were attributed to it in the course of the development of the national lithium project. The public communication drive initiated by the Morales government included promises of national strength through the creation of a national lithium industry, the securing of national wealth and greater self-determination. The critique of Bolivian neoliberal extractivist policies was embedded in and stemmed from long-term collective and institutional memories. Conventional underground or open-pit mineral extraction in the Uyuni region had been associated with early colonial history and neoliberalism, and had shaped Bolivia's national identity. Our data reveal that this identity was based on collective memories around resource abundance and value, the negative environmental impacts of conventional mining activities and symbolism around foreign exploitation. Such memories are in constant flux and ultimately constructed in the present. By contrast, lithium represented a departure from the colonial and neoliberal legacy, holding the potential for economic self-determination through the public project of lithium industrialisation. This, in turn, promised to generate wealth for the country and the region, as well as being critical for the global energy transition, therefore positioning lithium as a 'future-oriented' industry of local, national and global significance.

This symbolism is nicely illustrated by quotes such as, "We have the future of the world assured" (Section 5.3). This also refers to the future visions for the country and to the socio-technological imaginary associated with lithium (Barandiarán, 2019), including the expectation of national benefits trickling down to the people. The Morales government was the symbol for this imaginary, but it was also the entity that triggered expectations through media propaganda and, not least, was considered to be responsible for delivering the promised benefits. The failure to deliver tangible benefits contributed to a widespread feeling of mistrust in lithium governance towards the later years of Morales' presidency, as our interviews revealed.

Yet despite their loss of trust in the Morales government by 2019, local people's perception of lithium extraction as a 'clean' and 'future-oriented' industry remained strong. The concept of 'lithium materialities' – referring to both physical and social characteristics (Section 3) – can help us to understand the way in which public perceptions of lithium were shaped in the Morales era. According to interviews and conversations in 2019, public perceptions of lithium in the Uyuni region were based on the respective characteristics of the brine, the salt flat's crust and the evaporation pools, and the 'whiteness' of the salt flats and lithium itself. These were all essential elements in the perception and framing of 'clean' lithium and its 'clean' mode of extraction. Moreover, the government-led media communication around the lithium project strategically omitted information about environmental impacts, making it difficult for the public to have clarity about the extraction process and the technology behind it. The extraction was deliberately framed as evaporation from natural water through the sun, rather than as a complex process of chemical and technological engineering with inherent environmental and social risks, landscape change and extensive water usage.

Building on this understanding, we argue that the way in which the distinctive material characteristics of the salt flat, the brine, the lithium and its extraction process were interwoven with a decolonial narrative based on resource nationalism and self-determination, contributed to an overall perception of lithium that set it apart from any other extractive activities in Bolivia. The fact that this perception endured even when people had lost trust in the Morales government itself indicates the effectiveness of Morales' original communication strategy, but also the power of collective memory and the desire of people to believe in the constructed image of lithium as a 'clean' and 'future-oriented' mineral.

CRediT authorship contribution statement

Claudia Carpanese: Writing – review & editing, Writing – original draft, Conceptualization. **Gertrude Saxinger:** Writing – review & editing, Writing – original draft, Conceptualization. **Emma Wilson:** Writing – review & editing, Conceptualization.

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