


Modes of Extraction in Latin America's Lithium Triangle: Explaining Negotiated, Unnegotiated, and Aborted Mining Projects

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ABSTRACT

Mitigating climate change requires a global transition from fossil fuels to a “green economy” driven by renewable energies. This shift has fostered massive investments in mining resources, notably lithium in South America, needed to store renewable energies. These mining ventures often produce harmful externalities where lithium is located. In Argentina, a major producer, striking variation has occurred in the fortunes of lithium-mining projects. In some instances, mining companies offered concessions that mitigated environmental damage and improved local socioeconomic conditions. In others, companies made minimal concessions, and in a third set they halted projects in response to local resistance. Why do mining ventures result alternatively in negotiated, unnegotiated, or aborted extraction? The article proposes a new typology of modes of extraction together with a multilevel explanatory framework that centers on the strengths and strategies of transnational mining companies, subnational governments, and local communities in setting the terms for extracting lithium.

Keywords: Lithium, green economy, transnational mining companies, subnational politics, local indigenous communities, federalism

Mitigating global climate change requires a transition from fossil fuels, like oil and coal, to a “green economy” driven by clean and renewable energies, such as wind and solar power. The green energy transition has thus fostered massive new investments in extracting minerals needed to build batteries and other crucial infrastructure for storing and harnessing renewable energies.¹ This often overlooked extractive underside of the shift to a green economy can be seen vividly in South America, where a lithium-mining boom has occurred over the past decade.

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Together, Argentina, Bolivia, and Chile account for more than half the total lithium reserves in the world (US Geological Survey 2022). Of these countries, only Argentina allows exploitation freely through concessions, and this permissive regulation, coupled with low taxes, makes it especially attractive to foreign mining companies. Argentina's exports of lithium carbonate were US\$356M in 2018, ranking second only to Chile, with exports of US\$1billion (OEC 2020). Argentina started producing lithium in 1998, with an ongoing boom beginning in 2010. Mining is concentrated in three adjacent northwestern provinces, Catamarca, Jujuy, and Salta, which together form the Argentine leg of the "lithium triangle" straddling Argentina, Bolivia, and Chile (see appendix 1). The three provinces produced about thirty thousand tons of lithium carbonate in 2016, or about 16 percent of total global production.²

Although these provinces have shared political institutions, histories, and cultures as neighboring subnational units in a federal system, striking variation is observed both across and within them in modes of extraction; that is, how lithium-mining projects launched by transnational mining companies (TMCs) articulate with local stakeholders, especially indigenous communities and the provincial state. In some mining projects, lithium extraction was unnegotiated, with TMCs imposing their preferred terms and making few concessions, if any, to local stakeholders. In such instances, nearby communities experienced minimal economic benefits, coupled with significant environmental harms. In other cases, by contrast, companies negotiated with local communities and provincial state agencies for mining to proceed. In these instances of negotiated extraction, companies offered concessions, such as jobs, monetary payments, investments in public goods, and environmental monitoring, that improved local socioeconomic conditions and mitigated environmental damage. A third outcome, aborted extraction, resulted when companies chose to halt a project because of high costs stemming from organized resistance by communities.

Why do some mining ventures result in unnegotiated extraction whereas others result in negotiated or, alternatively, aborted extraction? To answer this question, this article focuses on five mining projects across the three Argentine provinces with the largest investments in lithium. Together, the five projects encompass a wide range of extraction outcomes: Fenix, a longstanding instance of unnegotiated extraction in the Salar del Hombre Muerto in Catamarca; Sales de Jujuy and Minera Exar, two cases of negotiated extraction in the Salar de Olaroz-Cauchari in Jujuy; the Salinas Grandes Project, a case of aborted extraction in Salinas Grandes-Guayatayoc, also in Jujuy; and ADY, a case of unnegotiated extraction in the Salar del Rincón in Salta.

This article discusses existing theoretical perspectives on resource extraction, highlighting the value for explaining contrasting modes of extraction of an integrated, multilevel framework that reaches beyond the tendency of previous research to study mining companies, subnational governments, and local communities separately. The article also proposes a new typology of modes of extraction, together with an explanatory framework that centers on the power and strategies of transnational companies, subnational governments, and local

communities in setting the terms of mining. After describing the selected cases and methodology, this study applies the framework in a comparative analysis of the five mining projects, showing how bargaining among companies, governments, and communities produced contrasting modes of extraction. The concluding section summarizes the findings and poses questions for future research on the extractive dimension of the transition to clean energies and a green economy.

RESOURCE CURSES AND BLESSINGS: THE SUBNATIONAL POLITICS OF MINERAL EXTRACTION

Much existing research finds that mineral wealth is a curse, not only in the case of oil (Mahdavy 1970; Beblawi and Luciani 1987; Ross 2012) but also for minerals generally (Atkinson and Hamilton 2003; Bjorvatn et al. 2012; Boschini et al. 2013; Orihuela 2013). In “rentier states,” mineral resources are associated with a host of pathologies, including poor macroeconomic performance, unstable growth, deindustrialization, and authoritarianism (Gylfason et al. 1999; Larsen 2006; Torvik 2001; Van der Ploeg 2011).³ Studies of lithium mining in South America report vast negative effects of mining on traditional economic activities, including small-scale agriculture, cattle husbandry, and artisanal salt production, as well as on the local environment, because of the massive amounts of water required to separate lithium carbonate from brine pumped from underneath salt flats (*salares*) (Argento and Zícarí 2017, 42; Slipak 2015; Puente and Argento 2015; Fornillo 2015).

Still, recent research on mineral extraction highlights the industry’s beneficial effects (Brunnschweiler 2008; Lederman and Maloney 2008), with new studies of lithium mining finding that it spurs innovation in productivity-enhancing technologies (López et al. 2018; Montenegro Bravo 2018). Other studies show that resource wealth can have contrasting effects, acting alternatively as a curse or a blessing depending on mediating institutional factors (Snyder and Bhavnani 2005; Snyder 2006; Luong and Weinthal 2012; Díaz-Rioseco 2016).

These various consequences of mineral wealth are especially visible subnationally, inside countries, because natural resources are not distributed evenly across national territories. Most previous research on the effects of resource wealth focuses on the national level, overlooking the territorial, subnational dimension. Recent studies increasingly exploit subnational variation in the distribution of mineral wealth to test, refine, and even challenge the national “resource curse” thesis (Arellano-Yanguas 2011; Arce 2014; Díaz-Rioseco 2016; Orihuela 2017; González 2018; González and Lodola 2019; Jaskoski 2022).⁴ These studies show that causal mechanisms proposed to explain the pernicious socioeconomic consequences of resource wealth at the national level either do not travel to subnational levels or require significant modifications when applied there (see, e.g., Goldberg et al. 2008; Monteiro and Ferraz 2012).⁵

We build on these and other exemplars of “place- and institution-sensitive research” (Orihuela 2017, 2; Amengual 2018) by offering a new typology of

modes of extraction and an integrated, multilevel explanatory framework that combines the role of federal and subnational political institutions with a focus on the strengths and strategies of TMCs, subnational governments, and local communities, actors that have often been studied separately in previous work on mining. We argue that lithium can be a curse or a blessing to provinces and local communities, depending on the relative power of TMCs, provincial governments, and local organizations, as well as the strategies these actors pursue to impose or negotiate their preferred modes of extraction. Together, our typology and framework help explain subnational variation in both the terms of mining and its political, socioeconomic, and environmental consequences.

A MODES OF EXTRACTION FRAMEWORK: SETTING THE TERMS OF MINING

At the most general level, three modes of extraction can result from TMCs' looking to launch mining projects: unnegotiated extraction, negotiated extraction, and aborted extraction. Unnegotiated extraction occurs when TMCs make few, if any, concessions to local stakeholders, either because mining is uncontested or because companies impose their terms despite opposition. Negotiated extraction occurs when local stakeholders, perhaps in collaboration with subnational governments, influence the terms of extraction; for example, by getting companies to provide jobs, public goods, or monetary payments. Negotiated extraction typically involves a "social license" and the creation of new institutions for governance and monitoring of TMCs in which communities and local government participate jointly.⁶

Depending on the balance of power among local communities, subnational governments, and TMCs, negotiated extraction can be symmetrical, with communities and governments enjoying significant influence over TMC behavior, or asymmetrical, with communities and governments holding weak influence. A third outcome is aborted extraction, which occurs when TMCs are deterred from investing, perhaps because of a stalemated negotiation with communities where no agreement can be reached about the terms of extraction, high levels of current or anticipated social conflict, or prohibitively costly regulatory burdens. Aborted extraction can also result when TMCs choose to leave a site in which they have already invested, calculating that the costs of further investments outweigh any anticipated profits, perhaps because of an increase in the strength of resistance by local stakeholders or a slump in international mineral prices.

As table 1 shows, TMCs, subnational governments, and local communities have different preferences regarding modes of extraction. Among communities it helps to distinguish two groups defined by their strategic postures. Maximalists are unconditionally opposed to mining, whereas moderates welcome mining if it is approved by a "social license" with acceptable and enforceable terms (Roth 2019). The maximalist preference for aborted extraction can be seen in a statement by a leader of the Santuario Tres Pozos indigenous community of Jujuy's Salinas Grandes region: "For us, Salinas Grandes is like a sacred mother. We must respect

Table 1. Actors' Preferences for Modes of Extraction

Modes of Extraction	Actors				
	Mining companies	Community maximalists	Community moderates	Laissez-faire governments	Interventionist governments
Unnegotiated	1	4	4	1	3
Asymmetrical	2	3	2	2	2
Symmetrical	3	2	1	3	1
Aborted	4	1	3	4	4

her because she takes care of me, my family and my children . . . There is no place for lithium mining” (Pressly 2019). A more succinct formulation of the maximalist position was prominently visible in graffiti along the sole highway that crosses Salinas Grandes: “Mining = Death = Treason. No to Lithium Mining, Yes to the Pachamama.” (See appendix 3 for further evidence of maximalist preferences.)

By contrast, moderates are conditionally supportive of mining if the terms of extraction are consensual and fair, as evident in statements by leaders of the El Angosto indigenous community of the Salinas Grandes region; for example, “We are not opposed to mining, but we want our voice to be respected” and “we say no to lithium if a prior, free and informed consultation is not made” (Flores 2017; Roth 2019; appendix 3). A further example of this position, and the tensions between it and the maximalist standpoint, is evident in the regular participation by some indigenous people in an annual celebration honoring Pachamama that not only was sponsored by the Sales de Jujuy mining company but was also held at its processing plant (Orocobre 2019; see also appendix 4).⁷ It is hard to imagine that anyone endorsing the maximalist formulation that “Mining = Death = Treason,” or even holding the less extreme position that mining poses an existential threat to sacred Mother Earth, would participate in a mine-sponsored event celebrating Pachamama.

Turning to the preferences of TMCs, the growing importance of norms and practices of “corporate responsibility” in the global mining industry has transformed how companies behave, as evident in annual “sustainability reports” routinely published by large mining companies documenting their community investments. These materials highlight how those investments align with the UN Sustainable Development Goals (SDG), the UN Global Compact, and other international standards of good corporate conduct (see, e.g., Orocobre ND). Together, such activities could be interpreted as evidence that TMCs prefer negotiated extraction.

Still, TMCs are fundamentally profit-driven, and the imperative to maximize the value of the bottom line and shareholder earnings produces a strong and, we argue, overriding preference for uncontested instead of negotiated extraction. This can be

seen in the annual survey by the global consulting firm Ernst and Young of more than 130 TMC executives. In 2020, for the third year in a row, respondents identified social “license to operate,” which depends on negotiations with community and other host country stakeholders, as the biggest source of business risk for mining companies.⁸

Mining executives’ negative risk assessment of negotiating a social license is further evident in the rankings of Argentina’s mining provinces by the Policy Perception Index (PPI) published by Canada’s Fraser Institute. The PPI, which is based on an annual worldwide survey of executives and senior managers of mining companies, ranks countries, states, and provinces according to whether public policies encourage or discourage mining investment (Stedman et al. 2020, 2). Salta, where an absence of organized community stakeholders, together with the provincial government’s *laissez-faire* posture toward TMCs, made unnegotiated extraction feasible, earned the highest average score (72.6) of the ten Argentine provinces included in the PPI between 2015 and 2019. By contrast, Jujuy, where organized community resistance and an interventionist provincial government made negotiated extraction the only feasible option for lithium mining, ranked seventh, with an average PPI score (49.7) far below Salta’s. Overall, the survey evidence suggests that TMCs prefer unnegotiated extraction, followed, in turn, by asymmetrical, symmetrical, and aborted extraction.

The preferences of provincial governments among modes of extraction are determined by whether the government is *laissez-faire* or interventionist. The former claim that resource-rich regions in underdeveloped countries should specialize in their comparative economic advantages by exporting unprocessed primary materials to developed countries with industrial processing capacity. These governments are also highly supportive of foreign direct investment (FDI), which is expected to spur employment in mining.⁹ Interventionist provincial governments, by contrast, support robust state participation in mining, not only to regulate it and raise revenue but also to add value to primary goods by building industrial capacity to produce manufactured products, such as lithium batteries.¹⁰ Unlike national governments, which can potentially make credible threats to nationalize TMC assets, subnational interventionist governments typically lack this cudgel and may thus enjoy less bargaining power, a weakness that will be exacerbated if neighboring subnational jurisdictions with the same minerals are led by *laissez-faire* governments. The preferences of *laissez-faire* governments mirror those of TMCs, whereas the preferences of interventionist governments resemble those of community moderates, although interventionists may prefer unnegotiated over aborted extraction because the former promises at least some revenue.

Given these preferences of companies, communities, and governments, the resulting mode of extraction depends on their power and strategies. Communities may have organizational resources that can be deployed to defend their interests through mobilization and protest, sometimes with support from national and even transnational NGOs. *Laissez-faire* provincial governments can use police repression and the judiciary to deter and demobilize community organizing. Interventionist governments, by contrast, will be likely to use their legal power to try to compel

mining companies to negotiate. Mining companies, in turn, can offer jobs, infrastructure, and money to communities and other stakeholders, including politicians, in exchange for extraction. The ability of companies to influence the mode of extraction depends on the amount of their sunk costs and other fixed investments in relation to projected profits from the mine. *Ceteris paribus*, TMCs with low sunk costs and modest anticipated profits will have more leverage over the terms of extraction than companies with high sunk costs and large projected profits.¹¹

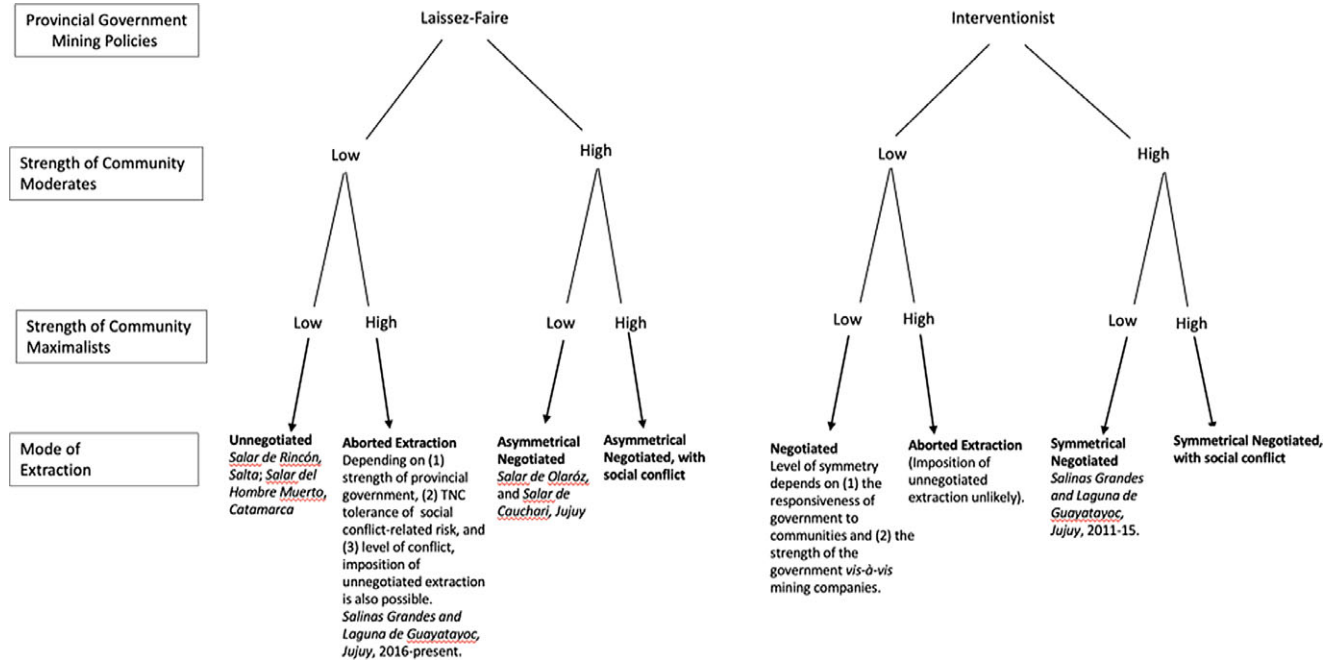
Figure 1 presents two logic trees showing the alternative modes of extraction hypothesized to result from variation in the power and preferences of provincial governments and communities. Unnegotiated extraction results when the government is laissez-faire and when moderates and maximalists are both weak, as is likely when communities are dispersed, geographically isolated, and disconnected from external civil society networks. Aborted extraction is predicted when communities are strongly organized and maximalists are the dominant force. Negotiated extraction is the predicted outcome when communities are strongly organized and moderates are the dominant force. Under these conditions, companies will face strong incentives to offer corporate social investments and take steps to mitigate environmental damage caused by mining. Negotiated extraction, in turn, will be more or less symmetrical, depending on the power of moderate community forces and also on whether the provincial government is laissez-faire or interventionist. Laissez-faire governments will promote asymmetrical bargains that favor TMCs over communities as a strategy to attract investment and generate jobs, whereas interventionist governments will push for more symmetrical agreements that regulate and tax mining to raise revenue, foster corporate social investments in communities, and protect the environment.

CASE SELECTION AND METHODS

This study examines five mining projects in three Argentine provinces: Fenix in Catamarca; Sales de Jujuy, Minera Exar, and Salinas Grandes in Jujuy; and ADY in Salta. The period of analysis begins in 1998 with the launching in Catamarca of the first lithium project, and focuses on the period of expansion into new investments across all three provinces running from 2010 to 2021.

Argentine provinces offer an excellent setting for exploring modes of extraction. The broad range of various extraction outcomes across lithium-mining projects, which includes uncontested and peacefully negotiated cases as well as conflictual ones, makes it easier to get beyond the one-sided focus on social conflict seen in much previous research on mining in South America (Orihuela et al. 2022; Walter and Wagner 2021). Argentine provincial governments are constitutionally mandated to administer mineral wealth and authorized to levy royalties, and they enjoy discretion both in regulating mining and using the revenues it generates. This discretion, which is evident in the strikingly different roles played by provincial government agencies in mining across provinces, provides an opportunity to

Figure 1. Provincial Government Mining Policies, Strength of Community Moderates and Maximalists, and Resulting Mode of Extraction



explore how subnational variation in state regulation and intervention affects modes of extraction.

Despite their spatial proximity, the three provinces differ in significant ways (appendix 2). For one, the relative size of the indigenous population is far smaller in Catamarca. And while the level of lithium production is similar in Catamarca and Jujuy, output in Salta is much smaller and, as of 2021, was still at the pilot project level. Moreover, the economic profiles of each province vary considerably. Catamarca's economy is heavily dependent on mining, especially copper and gold, whereas mining plays a far smaller role in the other two provinces. Jujuy and Salta both have more diversified economies than Catamarca, with services constituting the leading sector and with agriculture making a sizable contribution to Salta's GDP.

To help control for bias caused by these differences across provinces, as well as by omitted variables, we adopted a "one region, three subprovinces" research design that, as seen in appendix 1, takes advantage of the adjacent location of each province's lithium-producing area in the same region, the Argentine Puna. The Puna, which spans the western parts of Jujuy and Salta as well as northern Catamarca, is a high desert ecoregion with a frigid climate and scarce precipitation. The few inhabitants are mostly Kolla-Atacama indigenous people, who reside in small villages, surviving through subsistence herding of llamas, alpacas, and sheep. Because the Puna region consists of portions of the three lithium-producing provinces with similar demographic, ecological, and sociocultural characteristics, it provides a more powerful "most similar system" design (Przeworski and Teune 1970) than could be achieved with a province-level comparison.

Focusing on specific lithium-mining projects within this broadly similar region offers further methodological advantages. A focus on projects makes it possible to study mining ventures in close spatial proximity yet located on opposite sides of a provincial boundary. This, in turn, helps gauge the effect on modes of extraction of variation in provincial government policies. For example, the ADY project in Salta sits across the provincial border from the *Minera Exar* and *Sales de Jujuy* projects in Jujuy. A longitudinal perspective, looking at how subnational mining policies in a province changed over time (as occurred in Jujuy with the shift from an interventionist government to a *laissez-faire* one), provides additional leverage for estimating how changes in policy affect modes of extraction.

We analyzed the selected cases using primary data and official documents from provincial and national governments, together with firsthand observations in Jujuy, carried out before the onset of the COVID-19 pandemic in March 2020, which made it impossible to conduct further fieldwork in the region. We also drew on secondary sources, including reports, documents, videos, Twitter, and other social media posts by mining companies, local and transnational NGOs, community organizations, and specialized international institutions, as well as information from local and provincial newspapers. The richness of these digital sources, as illustrated in appendixes 3 and 4, highlights how remote ethnographic and mixed methods research provides a feasible way to carry out comparative research during a public health emergency, when conventional fieldwork is not possible.¹²

In addition, we conducted in-person and remote interviews with academic experts on lithium mining in Argentina.

LITHIUM MINING IN ARGENTINA: REGULATORY AND SOCIAL CONTEXTS

Extraction by TMCs does not occur in a vacuum. Contemporary mining is nested in a complex set of multilevel rules and regulations designed to protect the environment and local communities. At the international level, these rules include legal instruments codified in international treaties and regimes intended to protect indigenous peoples and the environment from negative externalities of mining; for example, Convention 169 of the International Labor Organization (1989), the United Nations (UN) Convention on Biological Diversity (1992), and the UN Declaration on the Rights of Indigenous Peoples (2007).

At the national level, governments, in addition to signing these international treaties and agreeing to abide by them, issue additional regulations, including setting tax and royalty rates on TMCs. In Argentina, the federal government deregulated mining in 1993 with a new law granting companies generous benefits for extracting and processing minerals, including “extensive tariff exemptions, tax relief schemes, 30 years of fiscal stability, and low provincial royalties” (Nacif 2014, quoted in Puente and Argento 2015, 122).¹³ This law eliminated all municipal taxes and stamp duties, setting royalties at 3 percent of the pithead price (Marchegiani et al. 2019a, 10). The federal government during the period under study played a minimal regulatory role in extractive industries, mostly limited to environmental protection and the participation of indigenous communities in managing natural resources located in their territories (Puente and Argento 2015, 123). As a result, Argentina has what Obaya et al. (2021, 2, 7) call a liberal federal regulatory framework for lithium mining.¹⁴

The Varied Roles of Provincial Governments

Because the federal government lacks a centralized strategy for lithium and ownership of minerals is reserved to the provinces, subnational governments and state agencies play important, if varied, roles across Argentina’s lithium-producing provinces. In Catamarca and Salta, the provincial governments have taken a *laissez-faire* approach, letting TMCs make investments and carry out mining activities with little oversight. In Jujuy, by contrast, the provincial state has played a more active and interventionist role, even becoming a minority shareholder in mining projects launched by private companies (Puente and Argento 2015, 123).

The first modern lithium venture, Project Fenix, was launched in 1998 in Catamarca, near the border with Salta. Today, the US firm Livent (previously FMC Lithium) and the Australian firm Galaxy Resources Limited own the two main projects in Catamarca, which are both in Salar del Hombre Muerto. The government of Catamarca created the state-owned company Catamarca Minera y

Energética Sociedad del Estado (CAMYEN S.E.) in 2012, and while CAMYEN has a monopoly over rhodochrosite, it plays no role in lithium (El Ancasti 2018).¹⁵

Lithium mining in Salta is also run by private companies. Although the provincial government created the state-owned enterprise Recursos Energéticos y Mineros Salta (REMSA), this company has mostly limited its role to attracting private investment in lithium (Slipak 2015, 98). Like Catamarca, Salta thus opted for a business-led *laissez-faire* approach dependent on private companies to explore, mine, and process lithium. The main production sites in Salta are Salar del Rincón, operated by the Australian firm Argosy Minerals Ltd. (ADY); Salar de Ratonés; and Salar Centerario, where the French company Eramet has invested.

In Jujuy, by contrast, the provincial state has played a far more active role in regulating lithium. In early 2011, the provincial government declared lithium a “strategic resource” and created a Committee of Experts in charge of overseeing lithium-mining projects (Informe Paralelo CDESC 2011, 4, quoted in Puente and Argento 2015, 123).¹⁶ Lithium extraction in Jujuy takes place mostly in the Salar de Olaroz-Cachauri in the department of Susques, at 4,500 meters above sea level and 60 km from the Jama pass to Chile. Sales de Jujuy and Minera Exar are the main projects. The Argentine subsidiary of the Australian mining company Orocobre Limited and the Japanese automaker Toyota Tsusho jointly operate Sales de Jujuy.¹⁷

The Chinese company Ganfeng and the Canadian company Lithium Americas Corporation run Minera Exar as a 50-50 joint venture (Marchegiani et al. 2019a, 21). After declaring lithium a strategic resource, the government of Jujuy created the state-owned enterprise Jujuy Energy and Mining State Society (*Jujuy Energía y Minería Sociedad del Estado*, JEMSE) in 2011.¹⁸ JEMSE received 8.5 percent of the shares of Sales de Jujuy, while the remaining 91.5 percent stayed in the hands of Orocobre (66.5 percent) and Toyota (25 percent).¹⁹ In a parallel arrangement, JEMSE also received 8.5 percent of the shares of Minera Exar (Marchegiani et al. 2019a, 22). A second important site for lithium mining in Jujuy is Salinas Grandes-Laguna Guayatayoc, where the Canadian firm A.I.S. Resources aborted its operations after facing sustained resistance from local indigenous communities.

These differences in provincial regulations and state involvement, while important, cannot by themselves explain the variation across the three provinces in modes of extraction. Within a single province, Jujuy, where the role of the provincial state does not vary, we see nonetheless sharply contrasting outcomes, with high levels of conflict resulting in aborted extraction in one area (Salinas Grandes and Laguna Guayatayoc), whereas in another area (Salar de Olaroz-Cachauri), low levels of conflict and negotiated extraction have led, in turn, to modest improvements in employment opportunities and local public services. While we might expect more conflict in Catamarca and Salta, where the provincial governments gave private mining companies free rein, lithium extraction proceeded without resistance in the former case for more than two decades and, as of 2021, continues to face no resistance in the latter. Furthermore, the recent emergence of protests against lithium mining in Catamarca, after more than

20 years of quiescence and without any notable change in the regulatory role of the provincial government, further highlights the inability of provincial government policies alone to explain variation in modes of extraction.

Community Stakeholders

In addition to nesting in a multilevel array of international, national, and provincial rules and regulations, extraction also occurs in a local context, defined by community stakeholders whose interests are affected directly by externalities, often harmful, of mining.²⁰ Community organization and mobilization helps explain the level of local conflict and the degree of redistribution of mineral wealth (Puente and Argento 2015; Argento and Zicari 2017).

Depending on their cohesion, organizational strength, and access to responsive state and government authorities and other key allies, communities vary in their ability to defend their interests, including by harnessing international, and perhaps national, rules and regulations designed to protect them. Moreover, communities may hold divided and evolving preferences about the desirability of mining. Especially in remote areas, mining may represent a welcome source of employment. Furthermore, under the rubrics of corporate social responsibility (CSR) and environmental, social, and governance (ESG) investing, mining may provide scarce public goods, such as schools and basic infrastructure, where the national and provincial state is unable or unwilling to deliver them (Amengual 2018). Communities may therefore face a difficult trade-off between negative health and environmental consequences, on the one hand, and positive economic and infrastructural benefits, on the other. This trade-off can give TMCs a strategic opportunity to offer selective incentives, such as jobs and targeted benefits, that produce support among some locals, undermining community solidarity and thus weakening the capacity to resist mining.

MODES OF LITHIUM EXTRACTION IN CATAMARCA, JUJUY, AND SALTA

We deploy our explanatory framework by focusing on lithium projects in *salares* (salt flats) across the three provinces. By studying projects with divergent extraction outcomes in the same province (i.e., Jujuy) and region (i.e., Puna), we exploit a “most similar systems” design that holds constant federal- and provincial-level factors, including the type of government and the provincial regulatory framework. In turn, by exploring cases with similar extraction outcomes across provinces, we draw on a “most different systems” design that illuminates how similar causal mechanisms—the strengths and strategies of communities, governments, and companies—determine modes of extraction across distinct institutional, political, and socioeconomic contexts.

Jujuy: Aborted Extraction in the East and Negotiated Extraction in the West

In Jujuy, modes of extraction featured aborted extraction in the east and negotiated extraction in the West. The lithium “white goldrush” began in 2010 with a wave of foreign investment aiming to mine brine deposits beneath the province’s *salares*. Sharply contrasting outcomes occurred on the eastern and western sides of the Puna Jujeña.²¹

In the eastern Puna Jujeña, a failed attempt at symmetrical extraction resulted in aborted extraction. In Salinas Grandes and Laguna de Guayatayoc, Orocobre and other TMCs faced strong resistance from indigenous communities, which mobilized successfully to halt their mining projects. Before the companies arrived, the sparsely populated and geographically dispersed Kolla and Atacama settlements were weakly interconnected. The companies’ entry in 2010 spawned a process of organizing that soon culminated in a confederation encompassing 33 indigenous communities across the region (33 Comunidades de la Cuenca de las Salinas Grandes y la Laguna de Guayatayoc).

While not unconditionally opposed to lithium mining, the 33 Communities demanded that it occur not only with their consent but also on their terms. With support from local environmental lawyers and a national environmental NGO, Fundación Ambiente y Recursos Naturales (FARN), which helped publicize their struggle, these indigenous communities drew effectively on international treaties and allies, forming a transnational action network (TAN) (Keck and Sikkink 1999). In 2010, the communities filed a legal injunction against the provincial governments of Jujuy and Salta demanding that companies respect their right to prior, free, and informed consultation about mining in accordance with International Labor Organization (ILO) Convention 169, which Argentina had ratified in 1992. Not only did the communities succeed in bringing their case before the Argentine Supreme Court, they also managed to get the Inter-American Court of Human Rights (CIDH) to review the case (Roth 2019). The communities also solicited successfully an endorsement and visit by the UN Special Rapporteur for Indigenous Rights, James Anaya.

The 33 Communities launched an intensive, multiyear deliberative process that resulted in a remarkable document, *Kachi Yupi* (Footsteps in the Salt, Comunidades Indígenas de las Salinas Grandes y Laguna de Guayatayoc 2015), which presented a community-approved protocol through which TMCs could gain their consent. The protocol, which provided a framework for symmetrical negotiated extraction, was submitted to the provincial government for ratification into law by executive decree. While the interventionist administration of the Partido Justicialista (PJ) governor, Eduardo Fellner (2011–15), would have probably supported this proposal, the newly elected probusiness and market-friendly government of Gerardo Morales (2015–present) delayed review of the community-generated protocol for three years, ultimately rejecting it in 2018. The government’s refusal

to approve the Kachi Yupi protocol and codify it into provincial law marked the failure of the initiative to achieve symmetrical negotiated extraction.

Soon after this rebuff of Kachi Yupi, a new mining company, the Canadian firm A.I.S., together with investors from Salta, moved, with the Jujuy government's approval, to end the eight-year moratorium on lithium mining in the Guayatayoc area by commencing exploratory drilling without community consent. This step toward unnegotiated extraction provoked protests and highway closings by the 33 Communities in February 2019. Having failed to achieve symmetrical negotiated extraction because of the lack of provincial government support, and facing efforts by TMCs to proceed without their consent, the 33 Communities shifted to a maximalist position favoring no extraction over unnegotiated extraction. The companies responded with a "divide and conquer" strategy, negotiating with individual communities that they believed could be persuaded to defect from the antiextraction position. Meanwhile, in a move signaling further disregard for the demands of indigenous communities, the government of Jujuy issued a tender for new lithium projects in the Salinas Grandes and Laguna de Guayatayoc regions in early 2019.

In sum, the bitter experience of the failed effort to achieve symmetrical negotiated extraction, combined with the government's unresponsiveness to their demands for prior consultation, drove the indigenous communities of the eastern Puna to pivot from moderate to unconditional opposition to mining, as signaled by their new protest slogan, *No al litio, si al agua y la vida* (No to lithium, yes to water and life). As a result, as of 2021, the Salinas Grandes and Laguna de Guayatayoc regions had yet to produce any lithium.

On the other side of the Puna Jujeña, a mere 50 miles to the west, the politics of extraction took a different course: asymmetrical negotiated extraction. In Olaroz, Sales de Jujuy, a consortium led by Orocobre initially faced resistance from a maximalist indigenous organization, La Apacheta, which opposed all mining. La Apacheta's resistance signaled to the company the need to build community support in Olaroz in order to neutralize pressures for symmetrical negotiated extraction or, even worse, aborted extraction, as occurred in Salinas Grandes-Guayatayoc. With the help of a local geologist and the provincial government, Orocobre soon reached case-by-case agreements with indigenous communities that guaranteed jobs, annual monetary payments, and modest public works, such as a new school and an internet access center. These negotiated concessions enabled Orocobre to start mining in 2015, making it the second company, after Fenix in Catamarca, to mine lithium in Argentina.

Following on the success of Sales de Jujuy, other international companies launched projects that transformed western Jujuy into a profitable lithium-mining district.²² One new entrant advertises its "low-risk" locational advantage in what the company's online promotional material tellingly describes as "a well-established, pro-mining business jurisdiction [that] minimizes the project's risk profile." Moreover, the project's location in the "prolific lithium-mining district" with a strong foundation of services and infrastructure is presented as an asset that

strengthens the company's "prospect of a fast-track to production" (Millennial Lithium 2018). Negotiated extraction thus opened the way for the Olaroz-Cauchari region to emerge as a dynamic hub for lithium mining.

In assessing the conditions that made negotiated extraction possible in western Puna Jujeña, it bears emphasizing that the maximalist organization La Apacheta was far weaker than its counterpart to the east, the 33 Communities. Not only did La Apacheta have a more circumscribed territorial reach, it also lacked the transnational ties and support from an internationally funded national NGO (i.e., FARN) enjoyed by the 33 Communities. If La Apacheta had posed a stronger threat, a more symmetrical negotiated outcome might have been possible.

The asymmetrical nature of negotiated extraction in western Puna was evident in the mounting frustration among community members with the increasingly visible harmful environmental and health effects of Sales de Jujuy's activities. According to a hydrogeologist from the University of Buenos Aires who toured the Olaroz plant in February 2019, the company's production methods involved an "environmental sacrifice." Local inhabitants were increasingly forced to move far away because of shortages of water suitable for human and animal consumption. Indeed, community members regretted having approved the Olaroz project (Roth 2019).

Salta: Unnegotiated Extraction

In stark contrast to Jujuy, no detectable resistance to lithium mining has emerged in Salta. The absence of resistance stems from three main factors. First, the mines are located in a sparsely populated area. Salar del Rincón, in addition to its high-altitude position 3,900 meters above sea level, is 150 kilometers from the nearest town (San Antonio de los Cobres) and has few roads connecting it with the provincial capital. The Department of La Poma, where Salar del Rincón is situated, is among the least densely populated in Salta, with a department capital of only 600 inhabitants that is more than 3.5 hours by car from the *salar*. Moreover, Salar del Rincón has few linkages to the socially mobilized Salinas Grandes Basin (Pueente and Argento 2015, 126).

Second, whereas in the eastern Puna of Jujuy indigenous salt cooperatives saw lithium mining as a direct threat to their livelihoods and culture (Argento and Zicari 2018, 13–14), in Salta lithium does not stand in conflict with local economic activities (Slipak 2015, 107). Third, the absence of resistance reflects the overall weakness of indigenous movements in Salta. The government of Salta has neither recognized indigenous communities near the *salar*s nor granted them land titles.²³ In addition to weakly organized community stakeholders, Salta's consistently market-friendly and probusiness provincial governments further explain the unnegotiated nature of extraction.

The perceptions of international mining executives confirm Salta's status as a mining-friendly province. According to a foreign executive of a large TMC with investments in Salta's Taca Taca copper mine, "On a relative basis to other parts

of the world the permitting process [in Salta] is transparent You hear about horror stories in various provinces of Argentina, yet here we have a mine [Mansfield's] that is going to be built as an open pit and it's going to use heap-leach and cyanide. Its EIA [Environmental Impact Analysis] was approved in a reasonable period of time" (Northern Miner 2011). Whereas some Argentine provinces, for example, Chubut and Río Negro, have banned the use of cyanide, in other provinces, notably San Juan and Santa Cruz, mining proceeds unhindered. "Salta is in that happy camp," the executive noted, "It's a pro-mining space . . . this is a great province to be in" (Northern Miner 2011). This view of Salta as a mining-friendly jurisdiction is widely shared among TMCs, as evidenced by the province earning the highest average score of the ten Argentine provinces ranked by mining executives in the Fraser Institute's Policy Perception Index (PPI) (appendix 5).

Still, Salta poses puzzles. According to a report published in 2017 by the Argentine Mining Geological Service (SEGEMAR), 31 of the country's 53 exploratory lithium projects were in Salta (Argento and Zicari 2018, 10). If mining conditions in Salta were so propitious because of the lack of community opposition coupled with a favorable regulatory climate, why, as of 2021, had none of the lithium projects actually started producing any lithium (beyond small-scale pilot production output), whereas Orocobre, despite operating in the social minefields of Jujuy, has been producing steadily since 2015? Salar del Rincón has the largest deposits of lithium in Argentina (Argento and Zicari 2018, 7), and while the project employed more than one hundred workers from nearby localities, with considerable investment by the company in constructing facilities, and carried out pumping tests and pilot production runs, it was still not in regular production as of 2021.

This delay probably has less to do with local factors than with global market conditions for lithium—the price fell in 2019 and 2020 before rebounding strongly in 2021—as well as the imperative to create an appearance of steady progress to satisfy company shareholders and raise additional investment capital. In the absence of community resistance, or even communities, companies may prefer to stand pat on lithium reserves, raising capital from investors based on anticipated future profits without actually mining anything. This speculative logic, in turn, may help explain the flurry of new and in-development lithium projects, more than 50 across northwestern Argentina, including many with sophisticated prospecting studies assessing the quality and size of deposits, yet with only a few (e.g., Sales de Jujuy; Fenix) actually producing significant lithium output as of 2021.

Catamarca: Contestation After Unnegotiated Extraction

In contrast to mining-friendly Salta, where weak indigenous movements and a laissez-faire government allowed mining to proceed unnegotiated, in neighboring Catamarca mining has, over the past two decades, met strong resistance from powerful grassroots movements, especially in Andalgalá and Tinogasta (Christel 2015). Despite the

contentious context for mining gold and copper in Catamarca, lithium has, until recently, faced no organized resistance. This allowed unnegotiated extraction to proceed for more than 20 years, since the Fenix project first began producing in 1998. Why, until late 2019, did lithium prove an exception to the contentious pattern for mining in Catamarca?

The remote location of Catamarca's lithium *salares*, near the border with quiescent Salta, partly explains the absence of contestation until recently. In both Salta and Catamarca, local communities are farther away from lithium extraction sites than in Jujuy. Moreover, unlike gold, silver, and copper mining, lithium mining from brine requires neither a large open pit nor dangerous pollutants, such as cyanide, which cause readily visible human and environmental harms (Haslam and Nasser 2016). Instead, lithium extraction in Argentina's *salares* produces a slow-moving and initially hidden, yet in an arid region like the Puna, ultimately devastating negative externality: depletion of freshwater aquifers.²⁴ Because the Fenix project in Catamarca was Argentina's first modern lithium mine, preceding the others by more than a decade, knowledge among local communities about the mine's pernicious hydraulic effects probably did not exist. The gradual drying up in recent years of the Trapiche River, the Fenix mine's main source of water for processing lithium brine, may very well have been the first visible indication to local residents of the mine's harmful impact.

The longstanding community quiescence that characterized Catamarca's lithium industry ended abruptly in October 2019, when members of an indigenous family were beaten by local police and arrested for opposing the removal of a livestock fence on what they claimed as ancestral property. The fence had been dismantled to open a road bypass for mining company vehicles involved in building a new, 30-kilometer-long aqueduct to carry fresh water from the Río Los Patos for lithium processing by the US firm Livent and two newly arrived companies. The provincial and municipal governments allied with the TMCs by declaring that the disputed land did not, in fact, belong to the indigenous family.

Meanwhile, local indigenous people who made up the Atacameños del Altiplano communities, together with antimining activists affiliated with the NGO Pucará: Pueblos Catamarqueños en Resistencia y Autodeterminación, based in the town of Antofagasta de la Sierra, mobilized against the new aqueduct. They accused the aqueduct project of violating ILO Convention 169 because it had not been subject to prior consultation and community approval for a social license. Local residents, who depend on the rivers to sustain their livestock husbandry in the Puna's harsh, arid climate, blamed the mining companies for causing the Trapiche River to dry up and were galvanized to prevent a similar fate for the Los Patos River.

Livent and the other companies showed no signs of wavering from the unnegotiated extraction enjoyed in Catamarca since 1998. Community mobilization against the mining companies was met with a level of repression not seen in Jujuy, with protestors beaten and arrested by provincial police.²⁵ Moreover, the mining companies provided vehicles to transport provincial police to protect the construction of the aqueduct (Aranda 2020). Provincial government officials,

notably the judge for mining (*juez electoral y de mina*) and the minister of mines, were unresponsive to petitions from indigenous communities to halt construction of the aqueduct. The judge reportedly stated that his court was “promining” (Pucara Pueblos Catamarqueños en Resistencia y Autodeterminación 2020).

Although both the current (Raúl Jalil, 2019–) and the previous governor (Lucía Corpacci, 2011–19) were affiliated with the Frente para la Victoria (FPV), the populist faction of the Justicialist Party (PJ), the provincial government and the police, together with the provincial judiciary, have been responsive not to the communities but to the mining companies. In mining, at least, Catamarca’s governments have behaved like *laissez-faire*, not interventionist ones. This promining inclination probably reflects the dominant role of mining in Catamarca’s economy as the basis of over 60 percent of the province’s GDP (appendix 2). While the communities near the lithium mines are supported by several new organizations, including Pucará and Antofagasta Resiste, they have yet to achieve the international, or even national, visibility of their counterparts in Jujuy. This low profile partly reflects the remote location of the mines in Catamarca, more than ten hours by car from the provincial capital.

Moreover, the communities in Catamarca faced a far more tenacious and formidable adversary. In contrast to the eastern Puna Jujeña, where the communities aimed to prevent mining companies from entering in the first place, in Catamarca the communities confronted a longstanding, entrenched company, Livent, with more than 20 years in operation. Not only did Livent have a large amount of fixed capital investments in the area, it had also forged strong ties with provincial and local government officials, as evidenced by the deployment of the provincial police as a private security force to protect the aqueduct and other company investments.

In further contrast with the eastern Puna Jujeña and with most of the more than 50 other lithium ventures in Argentina, the profitability of Livent’s operations depended not on the speculative promise of future production, as signaled by a concession for proven lithium deposits, but on its ongoing ability to produce lithium currently. To sustain profitable extraction, Livent was driven to expand the scope of its operations. Because Livent’s longstanding source of fresh water, the Trapiche River, was depleted, it needed a new water source. In the arid Puna, the Los Patos River offered one of the few such sources, and with the provincial government’s support, the company began building the aqueduct.

The communities in Catamarca took a maximalist stance, demanding cessation of lithium mining. Yet they were in a weak position. They lacked the national and international visibility and support enjoyed by their counterparts in the eastern Puna Jujeña. This was compounded by a geographically unfavorable location in a remote region with no major transportation arteries that would be vulnerable to a blockade by a small number of activists. In Jujuy, the proximity of the 33 Communities to a vital international highway linking northern Argentina and Chile empowered them to make credible threats to inflict heavy collateral economic damage on interests far beyond the lithium industry. The indigenous communities in Catamarca, by contrast, had no comparable sources of leverage.

In Salta, where lithium mining faced no resistance, unnegotiated extraction was feasible without repression. In Jujuy, neither the companies nor the government were willing to deploy the force that would have been necessary to impose unnegotiated extraction. In Catamarca, by contrast, where an actively producing, profitable, and locally entrenched mining project was involved, both the company and the provincial government, despite its populist affiliation, were willing to use repression to sustain unnegotiated extraction.

CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Lithium is a vital resource for making a successful global transition from fossil fuels to renewable energies like wind and solar power. The ongoing energy transition has therefore driven massive new investments in lithium mining in South America.²⁶ To provide a stronger understanding of this extractive underside of the green economy, this article has offered a new typology that distinguishes four modes of resource extraction—unnegotiated, symmetrical, asymmetrical, and aborted—with contrasting socioeconomic and environmental consequences. We have also proposed an integrated, multilevel framework for explaining modes of extraction that combines national and subnational political and regulatory institutions with the strengths and strategies of transnational mining companies, subnational governments, and local communities, actors that have often been studied separately in previous research.

Together, our typology and framework help explain the contrasting modes of lithium extraction across three Argentine provinces. In Salta and, until recently, in Catamarca, extraction was unnegotiated, with mining companies imposing conditions and making few, if any, concessions to local communities or provincial governments. In the western Puna Jujeña, by contrast, companies negotiated with and offered modest benefits to local indigenous communities and the provincial government. And in the eastern Puna Jujeña, extraction was aborted when the companies withdrew in the face of organized opposition.

Although federal and provincial political and regulatory institutions may have an impact on modes of extraction, they are far from decisive. The case of Jujuy, where we see sharply contrasting outcomes across subregions, is difficult to explain with a focus on such institutions because they do not vary inside provinces. Likewise, provincial-level institutions that did not change over time cannot explain the dramatic shift from quiescence to contention in Catamarca. Other, more dynamic subnational political factors seem to play a stronger role, including alternation between governors of different parties and distinct programs and coalitions of support.

For example, the shift in Jujuy from an interventionist PJ governor (Fellner), relatively responsive to grassroots pressures, to a *laissez-faire* and probusiness governor (Morales) made a negotiated outcome far less likely in the eastern Puna. Still, the partisan affiliations of governors are not a reliable predictor of modes of extraction: Catamarca, like Jujuy under Fellner, was governed by leaders affiliated

with an interventionist PJ faction, yet this resulted not in a negotiated outcome but in state-company collusion against indigenous communities and their allies, with the provincial police and judiciary acting in the service of the mining companies.

The surprisingly probusiness posture of Catamarca's interventionist governments probably reflects the province's heavy economic dependence on mining, whereas the governments of Jujuy and Salta operate in more diversified economies. Economic dependence on mining, in turn, made it difficult for Catamarca's government to implement the interventionist policies espoused by the national leadership of its partisan faction. A fruitful topic for future research might be how the level and nature of economic diversification affect not only the range of feasible policy options for subnational governments in mineral-rich jurisdictions but also the programmatic alignment between national interventionist elites and their provincial copartisans.

Local factors are crucial for explaining modes of extraction. These include the location of mines relative to population centers and major transportation routes, the capacity of communities to mobilize, and linkages among local, national, and international activist networks. Local conflicts are likely to emerge and escalate when mining threatens well-organized communities near vital transportation routes that can be easily occupied and blocked. The potential for escalation is amplified when communities are connected to national and international activist networks.²⁷ Under such conditions, companies will be more likely to negotiate and make concessions that improve the socioeconomic and environmental impacts of mining. On the other hand, if communities are weakly organized and disconnected from external civil society networks, mining companies will have few incentives to negotiate. Instead, as seen in Catamarca, companies may collude with local governments to repress resistance.

This study focuses on a federal system, where decentralized governance of natural resources have produced various modes of extraction both across and within subnational political units. We find little evidence that decentralized governance proves responsive to the interests of local communities that bear the brunt of the negative externalities that result from lucrative new mining ventures spurred by the transition to a green economy.²⁸ As seen in the unnegotiated outcomes in Salta and especially Catamarca, local law enforcement and government may be prone to capture by TMCs, tilting the balance of power in decentralized systems decisively against the communities negatively impacted by mining. The case of the eastern Puna Jujeña raises further questions about the responsiveness of decentralized resource governance to community stakeholders. The indigenous communities that launched the failed attempt at symmetrical negotiated extraction were well organized. They enjoyed not only the support of a robust transnational activist network but also a provincial government that was far less dependent on mining companies than in Catamarca and, at least under Fellner, relatively responsive to grassroots interests. Even under these favorable conditions, however, the preferred outcome of local stakeholders, symmetrical extraction, proved unobtainable, resulting in aborted extraction.

In contrast to Argentina, the two other countries that form South America's lithium triangle, Bolivia and Chile, are both unitary systems. An important question for future research therefore concerns the nature and distributional consequences of resource governance in more centralized political systems. In Chile, where the central state, through the *Corporación de Fomento de la Producción* (CORFO), owns the country's lithium reserves and closely regulates mining by domestic and foreign private companies, centralized governance seems to offer greater leverage, especially via environmental courts, for indigenous communities to tilt the terms of lithium extraction in a more symmetrically negotiated and favorable direction (Argento and Puente 2021, 140).

In Bolivia, where lithium mining is itself centralized under the control of a state-owned enterprise, *Yacimientos de Litios Bolivianos* (YLB), the terms of extraction have been contested forcefully, not by indigenous communities living near the remote, lithium-rich salt flats but by a powerful, mostly urban social movements led by the *Comité Cívico Potosinista* (Comcipo), based in the capital city of the department of Potosí. Ongoing center-periphery conflicts over the distribution of anticipated profits from lithium mining have stalled Bolivia's lithium production for decades.

Future comparative and multilevel research on distributional conflict among companies, governments, and communities concerning modes of lithium extraction will provide a far stronger understanding of how the urgently needed green energy transition can be achieved in ways that are not only economically profitable and politically sustainable, but also fair.

SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit <https://doi.org/10.1017/lap.2022.32>

NOTES

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1. Because of the high-charge density of lithium carbonate, rechargeable lithium ion batteries are increasingly used not only in consumer electronic devices, like mobile phones and laptops, but also in electric vehicles and for storing wind and solar energy.

2. Jujuy was responsible for about 12,000 tons, with the remaining output coming mostly from Catamarca and to a far smaller degree, Salta. The companies in the three provinces estimate that they can extract about 145,500 total tons by 2022 (Ministerio de Energía y Minería 2017). Although lithium mining projects exist in other provinces, such as San Luis and Córdoba, these mines were not yet in operation as of 2021.

3. Rentier states are countries that "receive on a regular basis substantial amounts of external rent" (Mahdavy 1970, 428; Beblawi and Luciani 1987).

4. On subnational and multilevel research as a fruitful way to study resource extraction and other key issues in comparative politics, see Giraudy et al. 2019.

5. See also Caselli and Michaels 2013; Postali and Slaibe 2009; Aragón and Rud 2009; and Arellano-Yanguas 2016.

6. The legal framework regulating the environmental license in mining activities in Argentina includes the National Constitution (Article 41), federal law 24,585 (Environmental Protection for Mining), and federal law 25,675 (General Environmental Law).

7. Pachamama, or “mother land” is an Andean goddess. Orocobre’s website offers attractive case studies of the company’s “community investment strategy,” anchored by the principle of “shared value” (appendix 4). See also *Conciencia Minera* 2019.

8. Forty-four percent of respondents ranked social license to operate as the top risk, above other factors, including the future of the workforce, rising costs, and cyber security. See Mitchell 2021; Dupont 2019.

9. López et al. 2018 call the leaders of such provincial governments “liberals.”

10. López et al. 2018 call the leaders of these governments “industrialists” or “developmentalists.”

11. Negotiations among TMCs, subnational governments, and communities occur in both formal and informal arenas. When a municipal or provincial government participates in negotiations, resulting agreements may become relatively institutionalized. Alternatively, direct bargaining among communities and TMCs can occur informally and can depend on ad hoc agreements between companies and community leaders.

12. On techniques for doing remote fieldwork during the COVID-19 pandemic, see Krause et al. 2021.

13. Código Minero, Law 24,196, adopted in 1993. The Constitutional Reform of 1994, in Article 124, states, “The provinces have the original domain of all natural resources in their territory,” which implies that provinces set their own rules in mining matters (Puente and Argeno 2015, 123).

14. The current president, Alberto Fernández, has taken steps to forge a national strategy in lithium, including launching a federal government lithium enterprise in July 2021.

15. The government of Catamarca created a longstanding state company, Yacimiento Mineros Agua de Dionisio (YMAD), in 1958. It formed a temporary joint venture with Minera Alumbrera Limited for copper, gold, and molybdenum. This company plays no role in lithium.

16. The committee included geologists and other experts from the National Scientific and Technical Research Council (CONICET) and the National University of Jujuy, who were nominated by the provincial legislature, the Environmental Management Agency, and the provincial mining department (Marchegiani et al. 2019a, 15). The committee was recently dissolved by the current governor through executive decree (Decree-Agreement No. 9194, July 17, 2019).

17. In 2021, Orocobre merged with fellow Australian lithium mining company Galaxy Resources to form Allkem Ltd.

18. Decree No. 7626 of the provincial executive, which created JEMSE, grants it broad authority in areas ranging from exploration to generation, commercialization, industrialization, and transportation of mineral wealth (Puente and Argeno 2015, 123).

19. Orocobre loaned JEMSE the money it needed to cover its share, and JEMSE agreed to pay it back by transferring to Orocobre 33.33 percent of its shareholder dividends (Slipak 2015, 97).

20. The varied nature, and visibility, of the “threat” posed by mining to communities also merits consideration, as discussed below.

21. See Pragier 2019 and Marchegiani et al. 2019b on the divergent outcomes across the Puna Jujeña.

22. The Exar joint venture of Ganfeng and the Lithium Americas Corporation in the Cauchari *salar*, adjacent to Olaroz, emulated successfully Sales de Jujuy’s strategy of asymmetrical negotiated extraction and was poised to become Argentina’s third lithium-producing company.

23. This lack of recognition of indigenous rights is evident in the provincial government’s refusal to send a delegate to the Supreme Court during the hearing of the case filed in 2010 by the 33 Communities of Salinas Grandes and Laguna de Guayatayoc, even though some of the communities involved in the case were located in Salta. To the degree that any organized indigenous mobilization exists in contemporary Salta, it occurs in the northern part of the state among the Wichí people and near the eastern border with Chaco and Formosa provinces. These areas have no lithium-mining activities (see Argento and Puente 2019, 195–97).

24. In addition to emerging slowly, these negative effects may be more difficult to verify scientifically, especially when the companies themselves are in charge of geological surveys and environmental impact assessments, as is often the case in the Argentine Puna.

25. The government of Catamarca had relied previously on police brutality to counter antimining protests, in both Tinogasta and Andalgalá in 2010. Lithium is not mined in either of these areas, however.

26. On recent moves by the US and the European Union to “onshore” lithium mining, see Riofrancos 2022. Such initiatives could have a significant impact on the politics of lithium extraction among producers in the Global South, for example, by driving down demand and prices.

27. Arellano-Yanguas (2011, 629) reached similar conclusions about mining in Peru.

28. See Ascher 2007 for an overview of research on decentralized governance of natural resources.

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