

**Using the Social Construction of Technology to Study the Effect of Political Strife in Bolivia  
on their Domestic Production and Export of Lithium**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this  
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## ***Introduction:***

The residue of fossil fuels is more and more visible as climate change exacerbates, leading to increased support for a renewable energy transition. Lithium-ion batteries are a probable renewable energy storage source, making lithium a highly coveted metal (Hancock & Ali, 2017). Lithium is often found through establishing evaporative ponds and mining salt flats. The prime area for lithium extraction from salt flats is “The Lithium Triangle”, or Argentina, Bolivia, and Chile (Lunde Seefeldt, 2020). Bolivia holds more lithium reserves in the Salar de Uyuni salt flat than any other location in the world. However, their rich reserves are contradicted by their minimal lithium exports. Bolivia accounted for less than 0.1% of total lithium production worldwide in 2021 whereas Argentina and Chile were responsible for 6% and 25% of total lithium production in the same year, respectively (weforum.org, 2023). The fact that Bolivia has not already transformed the lithium in the Salar de Uyuni into profit, even with foreign support, is somewhat peculiar.

Lithium extraction is technologically challenging enough without the potential addition of sociotechnical obstacles. Behind every human-based decision or project are people, who have emotions, backgrounds, and experiences that add both positive dimension and challenges to progression in any group endeavor. Bolivia is composed of several kinds of individuals, and therefore social groups, with varying viewpoints on lithium extraction in their country. The blend of opinions and histories among those social groups and their foreign relationships are likely behind how decisions regarding the lithium industry in Bolivia are handled. In order to hypothesize why Bolivia isn't profiting from lithium at the rate that may be expected from their concentrated reserve, the sociotechnical question posed in this study is “How have political differences and strife in varying social groups within and related to Bolivia affected their lithium

production, export success, and foreign relationships in the 20-21st century?”. The generational trauma relating to resources and quality of life in several Bolivian social groups is inevitably correlated with their minimal lithium production and exports. Resource nationalism, permanent revolution, and social injustice are three of the most relevant themes when comparing the relationships between Bolivian social groups and foreign relations over the 20th-21st century and prior.

***Background and Significance/Motivation:***

In spite of lithium’s personified support for the renewable energy transition, several industrial scale mineral extraction methods are supported by unsustainable social-technical practices. Lithium extraction done in salt flats or evaporative ponds typically lands on the shoulders of underprivileged and neglected workers, such as those in Bolivia. Indigenous Bolivians and working class members have paid the price in order for foreign nations to acquire their resources at inexpensive costs (Young, 2017). Reviewing the history of Bolivia in relation to resource extraction through the experiences of different social groups may shed light on why lithium extraction and production has been achieved at a slow pace in a country with such a large supply.

Bolivia, previously known as part of the Inca Empire, was colonized by the Spanish in the 1500s for their coveted resources. The Spanish enslaved native Inca members to harvest silver in Potosi, resulting in 80 million deaths of the indigenous Inca population over the first two years after the initial colonization (Firm, 2012). Since the 1500s, the area now known as Bolivia has been found to contain several other large reserves of desired resources including tin, natural gas, oil, and lithium (Sandor, 2009 & Kunasz, 2023). This has led and continues to lead

foreign entities to further abuse Bolivia's land and people in the interest of finding such goods. For example, tin mining in Potosi began in the 1500s as a result of Spanish colonialism (Kunasz, 2023). Britain and the U.S. received all of Bolivia's tin exports in the 1940s, and within the past decade countries including China and Germany as well as foreign private companies have expressed their interest in capitalizing on Bolivia's lithium supply (Young, 2017 & Kunanz, 2023). Regardless of the intentions behind these characters external to Bolivia, their desire for resources has led to themes of resource nationalism, permanent revolution, and social injustice throughout Bolivia since the 1500s.

From the 16th century until now, social groups have formed different political stances in response to their relationships with resources and foreign entities. Indigenous communities and the working class are usually at odds with Bolivian leadership and foreign entities. Within these social groups, resource nationalism, permanent revolution, and social injustice are some of the main recurring topics of concern. The research question in this study, "How have political differences and strife in varying social groups within and related to Bolivia affected their lithium production, export success, and foreign relationships in the 20-21st century?", focuses on the experiences and stances that each of the previously mentioned social groups carries on those topics and how they ultimately affect lithium production in the Salar de Uyuni today.

The following analysis discusses how leadership and foreign relations throughout Bolivia's history has affected indigenous communities' and the working class' political viewpoints, especially resource nationalism. Behind every economic, social, or political issue is a web of previous problems that propagates another. Therefore, reviewing Bolivia over time through historical analysis allows for a discussion as to why Bolivia has the current relationship that it does with lithium and the lithium industry. The relationships between these select social

groups before and during the 20th-21st centuries are thought to affect lithium extraction and production in the Salar de Uyuni region today. Ideally, the experiences of Bolivian social groups will reveal potential reasons for the lack of lithium production and exports in their country and offer a way to minimize the problems mentioned above related to the task of lithium extraction. Lithium is seen as an opportunity for electrification and profit by some, but it is a reminder of resource exploitation and abused power for many Bolivians.

***Methodology:***

The research question is studied using the Social Construction of Technology, or SCOT, theory. SCOT theory analyzes data with the assumption that humans drive change and such change is assisted with a tool known as technology (Giotta, 2018). It doesn't view technology as the main innovator for improvement, but it acknowledges that it exists in the realm of forward thought and progression. In this study, SCOT theory helps analyze how social groups in Bolivia interact with one another when in the presence of a certain "technology", or lithium and its extraction process. Some groups in Bolivia may perceive their lithium reserves as an advancement opportunity while others disagree. SCOT theory can help compare the viewpoints regarding lithium extraction and exportation, highlighting the role of human beliefs, background, and emotion while giving credit to the technology sparking such conversation in the first place, lithium.

Data was gathered from articles, books, and documentaries in order to conduct a historical analysis. The information from these sources is mostly secondary, but a few interviews with quotes from indigenous Bolivians were available and are considered as primary sources.

Historical analysis in combination with SCOT theory are the main tools used in the literature review and discussion below.

### ***Literature Review and Discussion/Results:***

#### *Research Question and Results Overview*

Historical analysis of the question, “How have political differences and strife between varying social groups within and related to Bolivia affected their lithium production, export success, and foreign relationships in the 20-21st century?”, led to several conclusions. The first of such is that indigenous communities and the working class appear to be mostly wary of lithium extraction in their country because of how past leaders and foreign nations have treated them to obtain their resources. For those in this social group who do support lithium production in Bolivia, they are adamant that it should be controlled and maintained by the state of Bolivia rather than private and/or foreign entities (Sandor, 2009, Young, 2017, & Paige, 2020). Past foreign nations have formed questionable deals with Bolivia to capitalize on their resource supply. They seemed like partnerships from an external viewpoint, but it often involved a wealthier foreign nation, such as Britain or the US, controlling Bolivia and its people in exchange for their resources at a cheap price (Young, 2017). Lithium extraction requires a lot of money and technical equipment that Bolivia will need to possibly outsource from foreign nations. Therefore, the second conclusion stemming from these observations is that recent Bolivian leaders have supported lithium extraction in the name of economic improvement and independence in Bolivia, but are hesitant to accept help from private companies and/or foreign nations for fear of repeating history (Young, 2017).

From the conclusions above, it's apparent that resource nationalism is a strong theme within indigenous communities, the working class, and even some leadership reigns in Bolivia. In other words, most Bolivians believe they should profit the most from their own resources or no one ought to at all. Such an observation is sensible after reflecting on how foreign nations have acted in supposed partnership with Bolivia in the past. Using the SCOT framework, the following review discusses the political ideologies that arose and tactics that were employed in the previously mentioned social groups as a result of resource nationalism. Studying the history of each social group relating to resource nationalism is important to further understand how lithium, a precious resource and technology, is perceived in this country.

#### *Indigenous Bolivian Communities versus Leadership and Foreign Entities*

Since the 1500s, indigenous communities, such as the Aymara and Quechua, have experienced discrimination, enslavement, and poor quality of life due to Spanish colonialism and resource exploitation (Firm, 2012 & Paige, 2020). Generational trauma among indigenous Bolivians is a result of the social injustice forced upon them over roughly the past 600 years by foreign nations and Bolivian leaders who take advantage of their labor and profit. In response to the repression they undergo, these communities work to maintain their native culture, language, and "...to live well rather than live better," (Goodale, 2019) through a variety of political tactics. Their relationship with resources since colonialism shapes the range of viewpoints on lithium in this community and whether it will help them live well. Inevitably, their willingness to either support or discourage lithium extraction in the Salar de Uyuni ultimately impacts the progress of the lithium industry in Bolivia.

The phrase “*suma q'amaña*”, or living well, is a motto for the quality of life that many indigenous Bolivians strive to achieve. Aside from resource nationalism, it is one of the most prevalent ideologies in indigenous communities. In an interview conducted with Cesar Navarro, an indigenous Bolivian and socialist, he reported that he once heard a fellow native comrade say, “*If we live better, others live worse. To live well means that we can all have what we need to live,*” (Paige, 2020, pg. 39). There is a difference in opinion among indigenous members regarding whether lithium extraction and production in the Salar de Uyuni will promote living well. It could further exacerbate resource exploitation, which has directly affected the quality of life of indigenous communities since the 1500s.

Since the 16th century and the start of Spanish colonialism, indigenous communities have been targets of racism and classism and felt that their lives are used to mine resources that benefit others while they continue to wallow in poverty (Sandor, 2009 & Kunasz, 2023). As recently as 2022, the World Bank reported that 15.6% of Bolivians still live below poverty level, and many of those individuals are likely indigenous members according to the latter statement (World Bank, 2023). When news of the potential economic benefit from lithium became relevant, some Bolivians were optimistic. Reports from the State of the World's Minorities and Indigenous Peoples 2012 – Bolivia noted that a portion of Potosi citizens supported lithium extraction and production in the Salar de Uyuni region until they realized their area received just 5% of royalties as a result of 2011 exports (MRGI, 2012). This same document details that of the 650 mining cooperatives in Bolivia with a total of 75,000 members, a majority of them are indigenous and presume most of their efforts support foreign entities (MRGI, 2012). Therefore, although indigenous members account for much of the work done for the improvement of Bolivia and its economy, they are continually left with little compensation.



The social injustice and poor quality of life they have been subjected to since colonialism have led to the creation of political groups and ideas that promote indigenous rights and revolution. Arguably the most influential revolutionary in indigenous Bolivian history is Tupac Katari. Motivated by the malpractices against his Aymaran community, Katari carried out a revolution in La Paz in the 1700s before his death at the hands of the Spanish (Lackowski, 2021). Katari fought against colonialism, resource exploitation, and indigenous abuse in Aymara. Many indigenous Bolivians from Katari's lifetime up to the modern day have felt that they battle for the same cause. Paige, author of *Indigenous Revolution in Ecuador and Bolivia, 1990-2005*, interviewed indigenous Bolivians who have had significant involvement in politics as a result of their passion for indigenous revolution. Two such interviewees include Felipe Quispe and Antonio Peredo. Katari was inspirational to their revolutionary leadership styles. For example, Quispe was a militant revolutionary popular in the 1990s and 2000s, quoted saying, "*But what brought inequality? Colonialism did,*" and is known for employing Katarist methods during protests (Paige, 2020). Katarist methods are revolutionary strategies inspired by the previously described Tupac Katari, including initiating battles and forceful protests. Antonio Peredo, a previous member of the Communist Youth League and Movimiento al Socialismo (MAS), promoted decolonization, but only supported war as a last resort for the indigenous revolutionary cause (Paige, 2020). The revolutionary lifestyles and values of characters such as Katari, Quispe, and Peredo inevitably affect the development of viewpoints on resource nationalism and consequently lithium in indigenous Bolivians.

There are two main viewpoints regarding lithium production and extraction in Bolivian indigenous communities: it's a possibility for Bolivia to improve its economic state and encourage resource nationalism or it's a chance for natives to become further repressed by the

state and foreign entities. For example, ex-President Evo Morales planned to build a battery factory in Bolivia that sourced local lithium (Firm, 2012). The Lithium Revolution, a documentary discussing the lithium industry in Bolivia in 2012, highlighted the opinion of one native Bolivian worker's opinion regarding the plant:

*“Up to now, we really haven't had the good fortune of having any commodities or amenities in this region due to extreme poverty. But we are convinced and believe that our project will free us from poverty. That motivates us and makes us proud to be here. We apply ourselves and struggle towards progress as we know we will one day live better than we have done up to now,”* (Firm, 2012).

However, other indigenous members don't agree with the opinion above. Another documentary, Salero, focuses on the life of Moises Chambi Yucra, a native Bolivian who worked on the Salar de Uyuni as a salero (salt miner). The film compares the experiences and viewpoints of Moises, an individual wary of lithium extraction in the Salar, versus Marcelo Castro, a project manager working to recruit workers in Moises' hometown for lithium development projects. Moises values the familial tradition behind his work and believes that lithium extraction in the Salar *“...can also create greed,”* (Plunkett, 2015). Marcelo, on the other hand, expresses an opposite outlook:

*“I think that we've entered an era of opportunities for everyone. Wherever we plant our seeds, we are watching them grow. We haven't even begun to scratch the surface of what we will eventually develop...so much wealth. Our lithium. And we have this entire area to work. I think*

*we'll be here for the next 500 years...This country has been backwards, dependent, underdeveloped. What we need to do is step on the accelerator because this is the first time that our country has the opportunity to use a natural resource for its own benefit. So this project is history, symbolic. And we can do it on our own. This isn't just about lithium. It's about this country saying good-bye to the past," (Plunkett, 2015).*

From the quotes above, it's visible that there is a difference of opinion among indigenous communities regarding lithium extraction and production in Bolivia. To many members in this social group, lithium is merely silver, tin, or natural gas peeking from behind a sustainable facade and looking to promote growth for anyone but native Bolivians. However, their insistence to live well is agreed upon by all. Since the 1500s, Bolivian indigenous communities have resorted to revolutionary lifestyles inspired by those such as Katari in order to minimize the effect of colonization and manipulative leadership in their lives and create a world where their descendants can live well.

### *The Working Class versus Leadership and Foreign Entities*

The Bolivian working class has inspired and influenced many political movements as a result of their employment experiences. Research details that workers continuously battle the effects of colonialism, and therefore their responses often mimic those of the revolutionaries Marx, Lenin, and Trotsky. Marx, Lenin, and Trotsky are historically known communists and revolutionary political figures from the 19th and 20th centuries (Larry, 2020). Resource nationalism, social injustice, and "permanent revolution", quoted from Trotsky, are the biggest themes behind Bolivian working-class culture (Sandor, 2009). Due to their strong ties to a

“permanent revolution”, they have influenced the development of arguably the most prevalent political parties in Bolivia over the 20-21st century, the Movimiento Nacionalista Revolucionario (MNR) and Movimiento al Socialismo (MAS). The MNR and MAS were shaped by the opinions and priorities of the working class, and consequently have claimed in different ways that they advocate for resource nationalism. Bolivian workers’ experiences have led them to exist in a “permanent revolution”, which inevitably affects their viewpoint on lithium extraction and production in the Salar de Uyuni.

The treatment of the Bolivian working class mirrors the initial enslavement of indigenous communities as the Spanish began to harvest silver mines in Potosi. Historically, the working class has protested unfair working conditions and formed political groups to implement change. The political preferences of the working class are largely communist and socialist due to the previously mentioned revolutionary influences, but the degree of support for communism versus socialism in this social group changed through the 20th century (Sandor, 2009, Young, 2017, & Paige, 2020).

In the 1920s, miners publicly supported Marxist-Leninist communism to oppose capitalism in Bolivia (Sandor, 2009). By the 1930s, Trotskyism was recognized as the pathway to a nation without social class and fair living and working conditions for all (Sandor, 2009). As the 1940s-50s arose, miners’ working conditions gained attention because they were mistreated by the organization that they inspired, the MNR, and foreign investors. Luis Penaloza Cordero, a economist who previously worked for the MNR, noted that when the MNR was leading in the 1940s, they were responsible for “...*paying truly starvation wages to the Bolivian mineworkers, transferred massive profits abroad,*” (Young, 2017, pg. 30-31). In the 1940s, Potosi miners were reportedly abused and underpaid, leading to inevitable depletion in their health and premature

deaths (Sandor, 2009). Another source reports that mining “...wages and working conditions in 1960 remained abysmal. ...real wages actually fell from 1950 to 1955. The rate of accidents increased over the same period in some of the major mines. In the mid-1950s the government itself estimated that perhaps half of all (...) miners suffered from silicosis and other lung and cardiovascular illnesses. According to a 1956 report by the US firm Ford, Bacon & Davis, the average life expectancy of a Bolivian tin miner who worked below ground was twenty-seven years; those miners who worked above ground averaged thirty-three years. A typical miner lasted between six and eight years on the job, a figure comparable to the longevity of the typical field slave in Brazil or the Caribbean during the most brutal periods of plantation slavery,” (Young, 2017, pg. 79).

As detailed in the quotes above, state leadership and foreign influences have used the Bolivian working class to obtain resources in a cheap manner without care for the people behind the process. Further examples of such include Spanish colonialism for silver and tin, as described previously, and British and US infiltration for oil and natural gas. The 1932-1935 Chaco War between Bolivia and Paraguay is one of the earliest 20th century examples of how working class miners were negatively affected by foreign British influence. While Bolivia and Paraguay were the active opponents of the Chaco War on paper, the two warring companies behind the conflict were British establishments known as Standard Oil and Royal Dutch Shell, both who wanted control over the oil and gas reserves in these areas (Young, 2017). After Bolivia lost the Chaco War and therefore failed to obtain more oil and gas reserves, workers across the country created unions and protests to promote socialism in hopes to prevent a foreign entity from initiating conflict among their land in the future (Sandor, 2009 & Young, 2017). Bolivian miners felt they sacrificed their lives to fight for land that would never benefit themselves or their descendants,

leading them to lose trust in the oligarchy at the time and further support resource nationalism (Young, 2017).

Minimal pay, mistreatment, and poor quality of life pushed the Bolivian working class to overthrow the government in La Paz in April 1952 and encourage the MNR to seize leadership (Young, 2017). The MNR initially supported resource nationalism and revolution as a primarily military socialist party, but became swayed by the opportunities for profit from capitalism and foreign entities. They lost the trust of the working class within 10 years after the start of the 1952 Bolivian revolution (Sandor, 2009 & Young, 2017). It's likely that many Bolivian miners felt as Alfonso Cordero, a worker who helped initiate the 1952 revolution, explains in the following quote:

*“We who made the revolution are being betrayed by it,”* (Young, 2017, pg. 114).

The lack of support provided to the working class from the Bolivian leaders has likely affected their outlook on any mining opportunities. As detailed in the previous examples, they have been granted numerous reasons as to why their leadership is untrustworthy. To compensate for a lack of reliable authority, they have turned to the three previously mentioned historical icons (Marx, Lenin, and Trotsky), carried out protests, and inspired the development of new political movements and parties with the hope that they will be different from the entity that previously betrayed them.

*Leadership versus Foreign Entities*

Considering both political figures and parties as modes of leadership, the most significant Bolivian leaders from the 20th-21st century are the Movimiento Nacionalista Revolucionario (MNR), Movimiento al Socialismo (MAS), and select Bolivian presidents during this time. These political parties and presidents have profound impacts on resource nationalism and social injustice within indigenous communities and the working class, as well as significant contacts with foreign entities. They are also majorly influenced by the lifestyle within the working class and are responsible for most decisions regarding the progress of the lithium industry in Bolivia and how involved it has been with foreign pursuers.

Before the MNR, Bolivia primarily operated under the lingering remnants of colonial rule. The MNR grew from the discontent that Bolivian workers felt after losing the Chaco War and the unreliable leaders that succeeded the battle (Sandor, 2009 & Young, 2017). The 1932-35 Chaco War was amongst two British oil companies for gas reserves in Bolivia and Paraguay, but the responsibility to fight was placed onto Bolivians who were not supportive of the war cause (Young, 2017). In 1936, President Toro, a former soldier, led for a brief time and encouraged minimum wage pay, labor codes, and discouraged big business by starting a state socialist party (Sandor, 2009). However, he was overthrown in 1937 as a result of disagreements between the degree of leftist versus rightist ideals that the government should operate at (Klein, 1965). Another former revolutionary soldier, Busch, succeeded Toro as president. Despite previously working for Toro under a socialist agenda, he turned to a dictatorship leadership style and committed suicide after ruling from 1937-1939 (Sandor, 2009). In between Busch's death and the revolution, working class miners poured their political efforts into parties such as the MNR rather than those technically in power (Sandor, 2009). Both the Chaco War and the tumultuous leadership afterwards inspired the Bolivian working class to create political parties in the

interests of resource nationalism and social justice. Out of all the political groups created in protest of the foreign intervention for resources that encouraged the war, the MNR won the most support in the working class and therefore succeeded in replacing the government that was overthrown in the 1952 Bolivian Revolution (Paige, 2020).

The core values of the MNR were resource nationalism and support for all social classes under one leadership (Young, 2017). However, they weren't attentive or supportive to indigenous people. The MNR spoke of equal treatment to all social classes, but didn't support rural indigenous communities until the 1940s (Young, 2017). They were also easily swayed by the opportunity for profit with foreign entities. Throughout the MNR's reign, it was criticized for encouraging and accepting foreign capitalist aid and relations rather than promoting the cause behind its initial platform – resource nationalism and social justice for Bolivians (Young, 2017).

Prominent examples of why working class miners and indigenous Bolivians lost trust in the MNR were “...a 1955 oil privatization decree, a 1956 monetary stabilization and austerity plan, and the Triangular Plan to overhaul the mining industry in the 1960s,” a series of policies that diverted funding away from the mining industry and discouraged resource nationalism (Young, 2017, pg. 59). The Triangular Plan enacted mass layoffs in the Bolivian state mining company, COMIBOL, in an effort to support private enterprise and was unsurprisingly put into practice by the Inter-American Development Bank, the US, and West Germany (Young, 2017). The US specifically hoped that the plan would help them spread the following ideologies throughout Bolivia:

*“...To foment among Bolivians the conviction that their best interests will be served by alignment with the United States and the democratic civilization for which it stands, and recognition of the*



*free world leadership...To show that American aid to Bolivia is materially benefitting the Bolivian people and has as its sole aim the democratic economic development of the country...To combat actively growing Communist influence and the tendency to accept Marxist dogma in Bolivia,”* (Young, 2017, pg. 98).

Spanish colonization, the Triangular Plan, and the previously discussed Chaco War have multiple parallels. In all three cases, powerful and wealthy foreign nations sought out Bolivian resources without concern for the indigenous community and the working class. They also attempted to force these individuals to become subservient to their governmental and political efforts in hopes for power and profit. The working class and indigenous community ultimately could not trust them to protect either their resources or intentions to live well. The ideologies behind the original intentions of the MNR, including resource nationalism and social justice, have lived on in Bolivia to the modern day.

By the 1980s, the MNR lost most of its influence to MAS as a result of both improperly handling internal inflation issues and their actions described previously (Paige, 2020). From the 1980s to the present day, MAS has commanded more authority than most other parties in Bolivia. MAS originated as a socialist party that valued “...*resource nationalization, economic development, greater equity, and more effective democratic institutions,*”, as well as indigenous communities (Sandor, 2009 & Young, 2017, pg. 180). At one time, MAS appeared like the new and improved version of the MNR. Support for this party seemingly grew at an increasing rate over time until Evo Morales’ presidency. Evo Morales is one of the most influential members of MAS and is the most recent ex-president of Bolivia. As the first indigenous president of Bolivia,

he gathered a lot of support using a platform focused on Katarism and promotion of indigenous cultures and communities (Firm, 2012 & Paige, 2020).

Before Morales, there were a series of presidents that operated under leftist principles at varying degrees. As MAS continued to gain experience as a political party, other leftist parties remained in leadership. During this time, Bolivia experienced quick leadership turnover and formed deals with foreign entities that ultimately hurt the working class and indigenous communities. Arguably some of the most detrimental events carried out in Bolivia were at the hands of President Gonzalo Sanchez de Lozada, or Goni. He was infamous for attempting to export gas to foreign countries at reduced prices to benefit private profit while a significant portion of the working class and indigenous community lived in poverty (Sandor, 2009). When an indigenous community attempted to take a stand against such, Goni ordered the military to massacre them (Sandor, 2009). Therefore, Goni likely impacted how the working class and indigenous social groups view the industries looking to profit from their resources.

From 2003-2005, Carlos Mesa, a left leaning political figure in Bolivia, briefly acted as president with Morales help and support. However, Mesa was removed as a result of citizens' continued protest about gas policies similar to those supported by Goni (Young, 2017). Morales became the following president under MAS with massive support from the indigenous community. Morales acknowledged the mistakes of past foreign relations, saying "We don't want bosses; we want partners," in response to being prompted to discuss the issues with gas resource nationalization seen before his presidency (Paige, 2020).

Shortly after starting his presidency, Morales voiced his support to nationalize their gas supply and construct a lithium production pilot plant financed by the Bolivian state (Firm, 2012). Morales' mention of a pilot plant was one of the first serious efforts to extract, produce, and

export lithium from Bolivia. Bolivia's previous experiences with resource extraction and exportation, including the Chaco War, the Triangular Plan, and the Gas Wars, affected the perception of lithium projects in the working class and indigenous communities. Lithium could improve the economic, political, and social operations in Bolivia, or become the next tin, silver, or natural gas for a manipulative foreign nation.

Morales hoped to use the potential profits of the lithium industry to improve long-term issues in Bolivia's economy and social structure. He planned to construct an airport in Uyuni and a state-based battery factory for the electric vehicle industry (Plunkett, 2015). These plans would theoretically increase jobs for the working class and indigenous communities while boosting Bolivia's economy. Morales' presidential efforts and decisions were based on socialist ideals that supported Bolivia as the leader of their own operations, especially in the development of lithium extraction and production processes (Kunasz, 2023). One source reported that Morales supported resource nationalism so highly that he refused to produce lithium from the Salar de Uyuni if there wasn't a guarantee that it would be used for Bolivia's own battery and electric vehicle industry (Kunasz, 2023). Another source reported that Morales was adamant about economic improvements in Bolivia in the following manner:

*“The Morales government has repeatedly stressed the need to increase value added and has taken some steps toward industrializing the minerals sector, such as by advancing smelter operations in Potosi and Oruro. It has spelled out an ambitious vision for processing hydrocarbons and lithium that promises domestic production of polyethylene, fertilizer, and other petroleum derivatives in the near future and – perhaps a few more years down the road – the production of lithium cathodes, batteries, and even electric cars,”* (Young, 2017, pg. 181).

His success in prioritizing gas nationalization and providing economic support for citizens resulted in the reality that “...*the Morales government has made substantial strides in reducing poverty and inequality, partly due to the 2006 reform...the MAS has been able to maintain considerable credibility among its base,*” (Young, 2017, pg. 182).

Bolivia began seriously exporting lithium in 2017 when Morales was president. They exported 13, 241, and 413 metric tons of lithium carbonate in 2017, 2018, and 2019, respectively (Kunasz, 2023). By 2020, lithium carbonate production halted due to investor issues in 2019 (Kunasz, 2023). One hypothesis as to why investor issues arose in 2019 is that Bolivia was hesitant to begin working under the control of foreign investors given their past history with such, including the Chaco War and US relations.

Bolivia will likely have to outsource funding for the equipment and machinery necessary to conduct extraction operations. Another source reported that there isn't a reliable supply of electricity and gas to power the processes to extract lithium in the salt mines (Firm, 2012). Therefore, although many Bolivians support resource nationalism, it's hard to obtain and profit from their resources without employing help from outside technological entities. This may lead citizens to prefer no lithium extraction development in their area rather than risk the manipulation experienced when in relation with a foreign country that desires a resource local to their homeland.

In summary, Bolivian leadership over the 20th-21st centuries has entailed a variety of political preferences and approaches. The generational effects caused by Spanish colonist leaders combined with the rule during 20th-21st century Bolivia has inevitably affected their social groups' opinions relating to lithium extraction, production, and exportation.

## *Conclusion*

The choices made by leadership and foreign entities are largely partial to the behaviors and viewpoints of the working class and indigenous communities. Leadership and foreign entities have wealth and power, and therefore ability to make decisions without complete approval or support from the indigenous community and working class.

To summarize the themes, colonialism promoted social injustice in Bolivia while spurring resource nationalism in indigenous communities and the working class. “Permanent revolution” throughout Bolivian history hints at why the lithium industry is undeveloped, if present at all, in comparison to their rich “white gold” supply. In conclusion, the working class and indigenous community are stuck living by way of “permanent revolution” as a form of defense against Bolivian leaders and foreign entities. While the search for lithium may be newer than that for silver, tin, and natural gas, the lengths to which foreign nations will reach to obtain such is possibly the reason as to why indigenous Bolivians, workers, and even nationalistic leaders are hesitant to pursue lithium extraction in return for the technological aid that they need.

Lithium extraction and the humanity behind such should be studied to ensure that social issues are eliminated from production endeavors. As the renewable energy transition is still in effect, researching how the lithium industry is monitored and changes over time in Bolivia is highly recommended. This analysis can be done in the eyes of the social groups chosen above using SCOT, or with another framework that still prioritizes the opinion and experiences of those behind the research. The idea of studying nations as sets of social groups that battle external factors may also be beneficial when searching for solutions to other humanitarian issues.

## *References*

Bhutada, G. (2023, Jan. 5). *This chart shows which countries produce the most lithium*. We Forum.

<https://www.weforum.org/agenda/2023/01/chart-countries-produce-lithium-world/>

Ceplair, L., University Press Scholarship Online e-Books - VIVA, & Ebook Central - Academic Complete (2020). *Revolutionary Pairs: Marx and Engels, Lenin and Trotsky, Gandhi and Nehru, Mao and Zhou, Castro and Guevara*. Lexington, Kentucky: The University Press of Kentucky.

Hancock, L., Ralph, N., & Ali, S. H. (29 Dec. 2017). *Bolivia's lithium frontier: Can public private partnerships deliver a minerals boom for sustainable development?* *Journal of Cleaner Production*, 178. <https://doi.org/10.1016/j.jclepro.2017.12.264>

Kunasz, I. (2023). *The Lithium Legacy*. Jenny Stanford Publishing.

Films for the Humanities & Sciences (Firm), Infobase, & New Docs (2012). *The Lithium Revolution*. New York, N.Y.: Infobase.

*GDP growth (annual %) – Bolivia*. World Bank.

<https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=BO>

Gina Giotta (2018) *Teaching technological determinism and social construction of technology using everyday objects*, *Communication Teacher*, 32:3, 136-140, DOI: 10.1080/17404622.2017.1372589

Goodale, M., & e-Duke All Books (2019). *A Revolution in Fragments: Traversing Scales of Justice, Ideology, and Practice in Bolivia*. Durham: Duke University Press.

Herbert S. Klein; David Toro and the Establishment of “Military Socialism” in Bolivia. *Hispanic*

*American Historical Review* 1 February 1965; 45 (1): 25–52. doi:

<https://doi.org/10.1215/00182168-45.1.25>

Lunde Seefeldt, J. (2020). Lessons from the Lithium Triangle: Considering Policy Explanations

for the Variation in Lithium Industry Development in the “Lithium Triangle” Countries of

Chile, Argentina, and Bolivia. *Politics & Policy*, 48(4), 727–765.

<https://doi.org/10.1111/polp.12365>

Mike Plunkett, & Plunkett, M. (2015). *Salero*. New York, NY: Cinema Guild.

Minority Rights Group International, *State of the World's Minorities and Indigenous Peoples*

2012 - Bolivia, 28 June 2012, available at:

<https://www.refworld.org/docid/4fedb407c.html>

Lackowski, P. (2021, Feb. 28). *Bolivia's Five-Hundred-Year Rebellion*. Toward Freedom.

<https://towardfreedom.org/americas-2/bolivias-five-hundred-year-rebellion/>

Paige, J. M. (2020). *Indigenous Revolution in Ecuador and Bolivia, 1990-2005*. University of

Arizona Press.

Sandor, J. S. (2009). *Bolivia's Radical Tradition*. University of Arizona Press.

Young, K. A. (2017). *Blood of the Earth: Resource Nationalism, Revolution, and Empire in*

*Bolivia*. University of Texas Press.