





Original research article

# Advancing recognition justice in telecoupled critical mineral supply chains: The promise of social media


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Received 10 February 2023, Revised 16 August 2023, Accepted 23 August 2023, Available online 31 August 2023, Version of Record 31 August 2023.

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<https://doi.org/10.1016/j.erss.2023.103264> 

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## Highlights

- Green energy transition increases demand for critical minerals such as lithium.
- Mining activities of critical minerals cause inequalities to affected local communities.

- Social media can amplify local concerns across the critical mineral supply chain.
- Recognition justice due to mining impacts is addressed from a telecoupling lens.

## Abstract

Electric vehicles and other low-carbon technologies are increasingly scrutinized for the injustices they impose on critical-mineral mining communities. Injustices arise because local communities that are disproportionately affected by mining are materially and cognitively distant to those who hold influence over supply chain practices, policies, and institutions. The outcome is that these communities lack recognition by producers and consumers who benefit from critical mineral extractions. We focus on the promise of social media as a means to assist distant local communities gain recognition as important stakeholders and as a vehicle for informing mineral-consuming public. Using a case study of the impacts of lithium extraction in Chile, we analyze social media (Twitter) to establish evidence of the telecoupled information flows for communicating the nature of impacts of lithium extraction and the potential for advancing recognition justice. Our findings offer initial evidence of the potential role of social media as a mechanism to: (1) improve the flow of information and knowledge from mineral mining sites into social networks, (2) give voice to local stakeholders who otherwise are not heard, (3) enhance recognition justice for these distal communities.

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## Introduction

The increased production of low-carbon technologies to address climate change has led to greater demand for critical minerals because they are essential to the production of electric vehicles (EVs), storage batteries, wind turbines, fuel cells, and solar photovoltaic panels [1,2]. However, the rising demand for these minerals has also brought concerns about their social and environmental impacts related to child labor [3], degradation of freshwater and marine ecosystems [4], and destruction to indigenous cultural heritage [5]. Addressing such externalities of energy transition requires improved public engagement and governance [6]. Industry efforts to address these harms have been criticized as being public-relation exercises rather than serious efforts to improve governance [7]. Because the local communities that are affected by critical mineral mining activities are typically distant geographically from where the final products are consumed, community voices are not heard, and the negative ecological impacts of mining and their effects on populations and places may be ignored. Social media is one relatively unexplored pathway that holds promise to amplify these voices and concerns.

Social media has the ability to enhance the flow of information across geographies, potentially serving to elevate justice concerns associated with these distal communities, thus motivating more sustainable governance [8]. We assess this potential through the lens of “telecoupling,” which argues that social-ecological interactions in distal locations can be “coupled” through material and non-material flows [[9], [10], [11]]. A telecoupling lens can bring focus to the role of information in connecting distal sites of production and consumption.

Previous telecoupling research has identified online news media (more generally) as one potential vehicle of knowledge flows in telecoupled systems [12,13]. Other research shows that in socially and environmentally sensitive industries, such as mining, web-based platforms can be used effectively to communicate sustainability impacts by enabling timely engagement with stakeholders to complement accounting and reporting of impacts [14].

However, to our knowledge, no prior studies have assessed how social media may enhance information flows across telecoupled systems by conveying and amplifying knowledge about the impacts of mineral extractions. In this way, social media can address the challenge of asymmetrical information among local communities most affected by critical mineral mining, producers, and consumers, and among the diversity of stakeholders across distal supply chain activities. Supply chains are embedded in power relations, structured by institutional arrangements, finance and capital, and power over discourse and narrative [15]. Critically, social media attention can serve to spotlight otherwise neglected or overlooked implications of consumption, providing opportunities to enhance recognition justice, or justice principles associated with the understanding and acknowledgment of social difference by those actors and organizations in positions of influence and power, and by society at large [16].

This research assesses the promise of social media as a vehicle to deliver information about environmental and social harms, thus acting as a tool to advance recognition justice for the populations and places subject to these harms. More specifically, we ask: *how does social media discuss the impacts of mining activities, which actors are involved in this social media communication about mining impacts, and how are these actors interconnected geographically? How do these results inform our understanding about the role of social media as a means to telecouple distal local communities by delivering information about environmental and social harms?* We explore these issues by focusing on how social media was used to disseminate information about lithium extractions in Chile, which supplies about 38% of worldwide lithium production. We assess Twitter communication specifically related to the very water-intensive mining activities in Salar de Atacama, which is one of the driest places on earth [17]. We also evaluate communications related to environmental quality degradation in the area and how it is affecting the livelihoods of local communities and the ecosystems on which they depend [[18], [19], [20]].

Our results show that social media provides a vehicle for influential local actors to communicate information about the negative sustainability impacts of mining, thus creating opportunities to reduce misrecognition. Additionally, these actors are embedded in networks that can potentially

amplify messages across geographical boundaries. Combined, our findings suggest that social media may serve as an important tool to facilitate the flow of valuable information associated with harms across telecoupled systems, giving voice to distal communities, thus enhancing opportunities for recognition justice in critical mineral supply chains.

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## Section snippets

### Environmental justice, telecoupling, and social media

Telecoupling refers to ways in which distal social-ecological-technical systems are connected in complex causal networks of influence and feedbacks, ultimately affecting the prospects of governance of the entire system of drivers and outcomes for sustainability [8,9,11] (see Fig. 1). These distal connections are often triggered by shifts in consumer demand or policy change in a “sending system.” In the case of critical minerals, consumer demand is located in the Global North, where the demand ...

### Case study

The Salar de Atacama has been a source of lithium mining since the late 1990s. Before lithium mining began, the region was mostly uninhabited and used for agricultural purposes by indigenous communities. The vast salt flats were also a source of sodium and potassium for local mining operations. Water resources in the Salar de Atacama, Chile can be considered non-renewable because of the limited precipitation that falls directly on the salt flat (approximately 10mm/yr) and the rapid rate of ...

### Timeline of Twitter chatter

We pursued two strategies with the same search string: a focus on local tweets and the global Twitter feed over the same time period. We see two contrasting temporal dynamics. Georeferenced tweets (“Local”) were much less abundant than non-georeferenced (“Global”) tweets and generally increased towards 2019–2020. This period coincides with significant political activism in critique of public policy in Chile, in which environmental concerns were also featured. In the “Global” Twitter feed, we ...

## Discussion

This research assesses the promise of social media as a means to telecouple distal local communities and deliver information about environmental and social harms, thus acting as a tool to advance recognition justice. Drawing on a case study of lithium extractions in Chile, we assess how social media (Twitter) discusses the impacts of mining activities, which actors are involved in this social media communication about mining impacts, and how these actors are interconnected geographically. ...

## Concluding remarks

Decarbonizing energy and transportation systems requires low-carbon technologies such as electric vehicles and renewable energy. Such efforts have led to increased demand for critical minerals such as lithium and international mineral trades between the Global South (where most of minerals are extracted) and Global North (where most of the technology products are consumed). Within this context, there has been a growing acknowledgement that the local impacts of mineral extractions on the ...

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. ...

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...Discriminatory epistemic injustice is reflected mostly in the Indigenous groups, or marginalised communities affected by the CM extraction. Indigenous groups possess important knowledge and experiences that not only reflect the social and cultural values of the nearby communities and local ecosystems (Agusdinata et al., 2023a) but which are also crucial to develop sustainable regulatory and adaptation plans for the mining companies and local authorities (Byskov and Hyams, 2022). However, similar to other mining industries, such as fossil fuels (Birch, 2016), the voices of Indigenous groups have been dismissed in discussions on the CM industry due to their undervalued credibility (Agusdinata et al., 2018)...

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