

Das Projekt begann mit gesellschaftlichen Debatten über die Energiewende, bei denen die globalen und lokalen Auswirkungen des Abbaus von wichtigen Mineralien wie Lithium allzu oft ausser Acht gelassen werden. Der Abbau solcher Mineralien trägt erheblich zu den Treibhausgasemissionen und dem Verlust der biologischen Vielfalt bei. Darüber hinaus wird die steigende Nachfrage nach Mineralien wahrscheinlich bestehende Probleme in der Bergbauindustrie verschärfen, wie z. B. soziale Konflikte um Wasserrechte, Vertreibung, widersprüchliche Nachfrage nach Land und Menschenrechtsverletzungen im Zusammenhang mit informellen Bergbauaktivitäten. Das Ziel des Projekts war, ein Netzwerk aufzubauen und Grundlagenforschung im Rahmen eines SNF-Antrags zu betreiben. Dies involvierte schlussendlich Zusammenarbeiten mit der ETHZ Departemente für Architektur (D-ARCH) und ETHZ Departement für Entwicklungszusammenarbeit (NADEL), sowie das UZH Departement Geografie und das University of Cambridge Departement Geografie. Das Projekt wurde als gemeinsames Vorhaben der drei Universitäten konzipiert, bei dem vorhandene methodisch-logische und theoretische Expertise zusammengeführt werden sollte, um innovative empirische Forschung mit gemischten Methoden und auf mehreren Ebenen durchzuführen. Das Stipendium mit dem Titel *Global Capital "Hitting the Ground": Frontiers of Lithium Extraction and Peripheries of the Energy Transition* (Grenzen der Lithiumgewinnung und Peripherien der Energiewende) erhielt sehr positive Kritiken, wurde aber leider nicht zur Finanzierung ausgewählt. Es wird überarbeitet und 2024 erneut eingereicht werden. Der Zuschuss ermöglichte auch eine erste Feldforschung in "sacrifice areas" in Mitteleuropa, die dem Alpenrheintal am nächsten liegen, und die in die Lehre an der Uni Li integriert wurde. Es unterstützte auch die Teilnahme von Prof. Howe und Dr. Herburger an mehreren herausragenden internationalen Konferenzen als Vertreter der Fachgruppe "Urbanismus und Gesellschaft" und finanzierte gemeinsame Workshops für Doktoranden mit der ETHZ und der University of Cambridge, die auf diesen Ergebnissen und Beziehungen aufbauten.

Öffentlichkeitsarbeit:
 Howe, L.B. (2023). Periphery, Peripheral, Peripheralization. NSL Colloquium on Planetary Urbanisation: Agendas for Research and Action conference presenter, Zurich, 20 October 2023.
 Howe, L.B. (2023). Thinking the Urban Through People. UCT-Unibas Open Research Seminar public lecture, for Prof. Andrew Tucker, 18 August 2023.
 Howe, L.B. (2023). Producing, Living and Reframing "Peripheral Urbanization". Association of American Geographers Conference presenter, Denver, 23 March 2023.
 Howe, L.B. (2023). Processes of Peripheralization in the GCR. RC21 conference presenter, Athens, Greece, 25 August 2022.

Workshops:
 mit Maan Barua und Nitin Bathla, 26 und 27 Oktober 2023. Diskussion der Projektergebnissen und Doktorandenkolleg an dem clinicum alpinum in Triesenberg.

Publikationen:
 Howe, L.B. (2024). From Lively Spatial Configurations to Lively Theorizations. *Urban Geography* book review forum, forthcoming January 2024.
 Howe, L.B., Parker, A., Rubin, M., Charlton, S., Cani, A. and Suleman, M. (2024). Multiple Publics, Disjunctures, and Hybrid Systems: How Marginalized Groups Stake their Claims to Transport Infrastructure. In Coutard O and Florentin, D (eds) *Routledge Handbook on Cities and Infrastructure*, forthcoming April 2024.
 Howe, L.B., Nkomo, M and Proksik, J. (2024). Global Randlords, Sacrifice Areas. A New Articulation of Imperialism? In progress for submission to *Environment and Planning A* in Spring 2024.
 Howe, L.B. and Herburger, J. (2024). Comparing the Politics and Governance of Housing Densification in Johannesburg and Vorarlberg. In progress for *Urban Studies* special issue by D Kaufmann, G Debrunner and J Kadi in Fall 2024.



Global Capital "Hitting the Ground": Frontiers of Lithium Extraction and Peripheries of the Energy Transition

1. Summary of the research plan

The subject of this proposal is how lithium extraction is negotiated, and what implications its extraction has for the green energy transition. We will investigate this in three work packages, by looking what happens at sites of lithium extraction - or what we refer to as "frontiers" - from (1) its impacts on social groups locally, to (2) processes of urbanization and urban infrastructure expansion, to (3) the global value chains (GVC) and the governance that emerges from extraction. We investigate multi-scalar understandings of extraction processes and technologies found in urban studies, as well as critical geographic, political economy, and development studies. The project is conceived of as a joint undertaking between University of Liechtenstein (UNIL), ETH Zurich (ETHZ), and University of Zurich (UZH), where existing methodological and theoretical expertise will be brought together to conduct transnational research and analysis of the empirical world.

Questions on the reconfiguration of "green" capitalism and extractive relations are of great significance, because energy transitions depend on many critical minerals located in countries of the Global South. We are particularly interested in what leverage people and institutions have with regards to regulate frontiers, as well as how they contest the forms of peripheralization that can result from extraction relations, such as "sacrifice areas" (Baklanoff 2008). As such, we seek to understand how capital markets and behaviors as a "hit the ground" (El Murrat and Nelson 2018) - does it extract space and social relations locally, reconfigure geographical relationships, or reshape colonial legacies across the Global South?

The project focuses on two sites of lithium extraction in South America and Southern Africa. The first is the cross border region of Chile, Argentina, and Bolivia known as the "lithium triangle" (2018), where most of the world's lithium originates. The second is Zimbabwe (2018), the largest producer in Africa, with the most dynamic lithium mining sector. From large scale, mechanized projects to unregulated increases in artisanal scale mining, IIR and IIRM comprise approximately 70% of current lithium reserves. In addition to these global agglomerations, we follow the practice of "digging" (Baklanoff 2015), in which sites to study are selected partly by accident and partly by design. Sites of extraction may emerge from a combination of historical and processes of extraction (i.e. that leaves little to no mining in IIR, but face potentially similar challenges from extraction urbanization (i.e. political protest, urban policy and development, or the re-configuration of GVC).

We investigate our multi-scalar approach to explore, as well as to intervene for people and institutions connected to lithium extraction. We hypothesize mineral extraction acts as a "double edged sword", providing both opportunities and reinforcing multiple forms of peripheralization for people (i.e., workers, families living near the site, local brokers, IIRs). Consequently, we will investigate how people and institutions negotiate, contest, and cope with peripheralization (i.e., "digging") through production, resistance, and other forms of life. Sites of extraction may emerge from a combination of urban, political, social relations, and capital. This combination and built on from its existing research into resource frontiers, urbanization, and development impacts, and resource governance in the Global South (see 1.1.3, 1.2, and 1.3). We will contribute to a scientific audience through public talks, to students or an interested audience through teaching, and to experts at least through accessible outputs, such as a short film and articles in popular media (see 1.2.3 and 1.3.3).

2. Research plan

2.1 State of research in the field

The project's point of departure is prevailing societal debates about energy transitions, with two others overlaid: the international global and local implications of extracting minerals like lithium (Zuidwijk 2015). In this section, we discuss existing scholarly research into the politics and governance of extraction, and the state of research at our sites. We then open this to describe where further research is needed, which we frame in terms of "frontiers" and "peripheries" (Baklanoff 2015) to describe multiple spatial scales in the lithium triangle (2018) and Zimbabwe (2018).

2.1.3 Prevailing societal debates about sustainable energy transitions

To slow down global warming and mitigate some of the most severe risks associated with it, industrialized nations are gradually embracing the idea of a "green energy transition" to reduce fossil fuel consumption. However, despite growing acceptance of "sustainable" energy sources and projections about the energy transition, the "how and" (How 2012) remains unclear. Resource extraction has always been the basis of development, growing production and providing the infrastructure required for increasing quality of life in our subject's region to allow goals such as Agenda 2030 and the Paris Agreement. A rapid reduction in the use of fossil fuels, in search for renewable energy, and the identification of transport and agriculture as the demand for mining resources, lithium is a key mineral in this transition (Dostal et al. 2020; Weber et al. 2022; McKinley 2022) profiled as "emerging growth" for industries like lithium in battery production

Lithium Frontiers & Peripheries

Lithium Frontiers & Peripheries

driven by the green energy transition, noting that its value chain could "grow by over 30 percent annually from 2022 to 2030, driven by a world-wide value of more than \$400 billion."

Extracting such minerals significantly drives greenhouse gas (GHG) emissions (Baklanoff et al. 2022) and biodiversity loss (Baklanoff 2015). Particular concern (PM) related health impact of mining has also been studied over the past two decades (Baklanoff et al. 2015; Colwell et al. 2018) and mining is a key driver of water pollution globally (De Souza et al. 2022). Moreover, the increasing demand for minerals is likely to exacerbate existing problems in the mining industry, such as social conflicts over water allocation and pollution, health concerns of communities living around mines, displacement, conflict, demand for land, and various human rights abuses frequently associated with lithium, "artisanal" mining activities. These are the kinds of relations that we investigate how new actors and capital accumulation are "digging" (Baklanoff 2015) spaces, meaning how they are involved in forms of urbanization and different social groups' responses to these processes.

The issues of energy transitions, urbanization and infrastructure, and negotiating peripheralization (the double-edged sword) are central to this project and its scholarly audience. Existing research indicates that opportunities for the Global South to leverage energy transitions could be on the ways that global value chains on extraction, local processes, how urbanization processes unfold and urban infrastructure is made, and how we all engage together the politics and power relations of extractive mechanisms. In contrast (2015) to state-centric and sustainable approach to mining thought beyond the relationship between specific projects and local communities and address the quality of life the multiple places in which the production networks of extractive industries unfold. Research into the conceptualization of "frontiers" and "peripheries" across multiple scales is required, which the project will attempt to deliver as world theoretical concepts, in order to understand and conceptualize locally specific phenomena for broader theoretical implications (see 1.1.3).

2.1.4 Existing scholarly research into the politics and governance of extraction

Lithium extraction (Baklanoff 2015) is mineral extraction in part of the complex systems of reproduction, characterized by uneven geographies and uneven power relations (see 1.1.3). Dependency theory (for example, Chibonjo 1987; Cardoso and Faletto 1979), as well as Wallerstein's (1974) world systems theory provided a framing for this in the 1980s and 1990s, describing how countries in the Global South have historically been linked to "peripheral" relationships with the Global North (cf. Moran et al. 2015). The conditions resulting from extraction in Southern Africa and Latin America has historically ranged from Aboumatar (Morales and Brennan 2013; Schmitz 2003; Guterres-Vincent 2008) to the creation of vibrant urban centers (Dostal 2008; Baklanoff 2012; Leggett 2008). More recent research describes the relationship in terms of the "lithium triangle" as "the impact of extraction on the sub-national level" (Schwartz and Street 2018), along with how extraction leads to the spatialized exploitation and super-exploitation of labor through "peripheral urbanization" from a political economy lens (Baklanoff 2022). Similarly, the work by scholars, from Baklanoff (2015) to Aiken et al. (2014), Herburger et al. (2018), 2019 and Herburger et al. (2021) (Herburger 2019), highlights the importance of politics and social mobilization in the production of space related to extraction. While the concept of the "periphery" remains open to a theoretical perspective (as discussed in 1.1.3), Baklanoff (2007:251) describes it as a "relational sociological condition" for rethinking capital and extracting labor through what he terms "sacrifice areas."

Comparative analysis is a key starting approach to understanding the politics and governance of extraction. This project follows calls by scholars such as Robinson (2006, 2016) from urban studies, as well as Simmons and Rusk Smith (2022) in political science, to rethink comparison as a means of exposing the similarity faced challenges of extraction and exploitation, to compare shaped by distinct histories. Comparison on this level includes, even if the areas of study are organized according to different social, political, and economic systems. Robinson (2017:173) advances for this practice, which she refers to as "digging" because it allows the investigation of linkages, because of power, and questions of scale on horizontal, vertical, and transnational axes (for this notion, see Baklanoff and Moran 2017), and to see whether similar trade-offs and dilemmas arise in complex and changing contexts (Dostal and Baklanoff 2018:19). Thus we use just "digging" and "disentangling" relationships resulting from processes of extraction, rather, they "materially constitute one another" (Baklanoff 2021:187), allowing us to read global processes through specific sites where these processes operate. The interconnections of spatial and social processes, which link places and contexts through the global with the local, is also relevant to some of the locally situated theories in urban studies, such as in development studies (Baklanoff 2015; Brennan and Schwab 2012, 2015) and extended urbanization (Gutiérrez and Franco 2018; Moroz-Mor 2018; Schmid and Götting, forthcoming). The urban in the scale at which transnational, national, and local relationships materialize and come into conflict. The necessity of understanding urbanization across scales, in all its complexity, is in this particular context where thinking through context of Southern Africa and Latin America. Work into the development of impact of extraction regularly advances capital accumulation for "people inhabiting the spaces in which the mining production network emerged a strong influence" (Baklanoff 2022:7). Questions of these specific histories, the interaction between global capital and local agencies and the power arrangements that result thereof, as well as how their relationship links to urbanization, peripheralization, and the governance of global value chains are therefore central to our research questions and work packages (see 1.1.4).



Howe, Lindsay "Digging for lithium" as urbanization and peripheralization, by How, Lindsay "Lithium extraction project", of Urbanization 2022

