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For a Latin American Political Ecology of Climate (Im)mobilities

Para una Ecología Política de las (In)movilidades climáticas

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Abstract

Research on the climate change-human mobility nexus remains largely dominated by agendas shaped by the Global North, leading to power inequalities in practices, policies, and knowledge. Critical scholarship has identified political ecology as a valuable framework for addressing these problems. In this paper, we argue that Latin American Political Ecology (LAPE) provides unique insights for addressing this challenge.

Drawing on four case studies from the Andes and the Amazon, we explore how LAPE can inform a research agenda on climate (im)mobilities. We identify three areas in which this convergence could be particularly fruitful: the implications of climate (im)mobilities for food sovereignty; the *more-than-human* character of the communities affected by climate-related hazards; and the role of extractivism in shaping climate (im)mobility in rural areas. We also highlight the prevalence of coloniality of knowledge in climate (im)mobilities governance, reflecting on the positionality of the climate (im)mobilities researchers.

La investigación sobre cambio climático y movilidad humana ha adquirido creciente relevancia en los últimos años; sin embargo, este campo sigue estando dominado por agendas definidas desde el Norte Global, generando desigualdades de poder en prácticas, políticas públicas y producción de conocimiento. La literatura crítica alrededor del tema de la crítica ha identificado la ecología política como un enfoque valioso para abordar estas deficiencias. En este artículo, argumentamos que la Ecología Política Latinoamericana (EPL) ofrece perspectivas únicas para esta tarea.

A partir de cuatro estudios de caso de la región andina y la Amazonía, este artículo explora cómo la EPL puede fundamentar una agenda de investigación sobre las (in)movilidades climáticas. Identificamos tres áreas particularmente prometedoras: las implicaciones de las (in)movilidades climáticas para la soberanía alimentaria; el carácter más que humano *de las comunidades afectadas; y el papel del extractivismo en la configuración de las (in)movilidades climáticas. También destacamos la prevalencia de la colonialidad del saber en la gobernanza de las (in)movilidades climáticas, reflexionando en la posición de los investigadores en esta área.*

Movilidades climáticas; ecología política latinoamericana; extractivismo; colonialidad; comunidades indígenas y campesinas

Key words

Climate (im)mobilities; Latin American political ecology; extractivism; coloniality; indigenous and peasant communities

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1. Introduction

The nexus between climate change and human (im)mobilities is arguably one of the most promising topics in contemporary socio-ecological research. In recent years, it has been the center of a vibrant scientific debate, with publications increasing steadily (Hoffmann et al., 2023). There are several reasons for its increasing prominence. Firstly, there is a growing number of people displaced by climate-related disasters worldwide (Internal Displacement Monitoring Centre, 2024). Secondly, migration and refugee issues have become ever more politicized, emerging as a major concern for public opinion, especially—but not exclusively—in the Global North (Bettini, 2013). The possibility that climate change may lead to a higher number of migrants and refugees in developed countries has, as a result, become a major topic of discussion, often overshadowing other issues that should be prioritized within global climate action.

Furthermore, political pressure has led to xenophobic representations of the potential negative impact of the future climate refugees, particularly in the Global North (Baldwin, 2022). This prejudice has resulted in securitarian approaches that not only generate ineffective policies and interventions but also deepen climate injustice (Boas, 2015). At the same time, however, this debate has enabled the development of critical approaches that have increased awareness regarding the "climate migration myths" (Boas et al., 2019), which inspire misguided policy orientations concerning the problem.

Undoubtedly, several knowledge gaps persist regarding the human (im)mobilities-climate change nexus. Among other reasons, this is due to the geographical unequal development that characterizes the field: most existing research has been conducted by academics based in the Global North and the majority of the research has focused on a very specific set of countries—particularly the United States, Mexico, Brazil, Ethiopia, Burkina Faso, India, and China—leaving many world regions underrepresented (Hoffmann et al., 2023, p. 85).

Consequently, there is still insufficient scientific production on the nexus between climate change and human (im)mobilities from and about Latin America. This constitutes a problem as the region is particularly vulnerable to the effects of climate change. Socioeconomic characteristics of its population may exacerbate these impacts, leading to changes in the human mobility patterns that have characterized the region in recent decades (Castellanos et al., 2023, p. 1691). Furthermore, the scarcity of Latin American research in the field may hinder its analytical development, as the region has historically contributed to global knowledge through multiple intellectual traditions, providing valuable insights across several areas

of human knowledge. One area in which these contributions have been widely recognized is political ecology (PE hereafter). Although PE is a global research field enriched by contributions from around the world, Latin American political ecology (LAPE hereafter), as argued by Moreano et al. (2017), has its own distinctive "identity marks" that position it uniquely within global discussions of the field.

As argued by Vigil (2024), PE offers a valuable perspective for understanding topics considered fundamental for future research agendas, such as the role of economic and power inequalities in shaping these processes. However, the specific contributions of LAPE perspectives to this research field remain largely unexplored, with the exception, to our knowledge, of the works of Gini (2025) and Majdoub (2025).

Far from suggesting a disregard for the contributions of other regions to the development of a political ecology of climate (im)mobilities, we aim instead to highlight that such a project would greatly benefit from the "situated knowledges" (Haraway, 1988) produced in Latin America, grounded in the region's specific historical, social, and environmental contexts.

In this article, we examine how LAPE can contribute to this research agenda, drawing on an ongoing project that includes the development of four case studies conducted between 2024 and 2025 in the Andean region and the Peruvian Amazon. Rather than presenting the empirical findings of these case studies, our aim here is to use our recent research experience as a starting point for advancing a theoretical reflection on how the climate (im)mobilities research agenda can engage with core themes of LAPE. Accordingly, empirical insights from the case studies are used primarily to illustrate this potential convergence.

This article is organized around an argument presented some years ago by Moreano et al. (2017). According to these authors, LAPE has several "identity marks" that distinguish it from other PE bodies of work. After presenting some methodological details of our research, we will outline these "identity marks." The remaining four sections of the paper examine how the issue of climate (im)mobilities relates to some of the main topics of debate within LAPE, using our case studies as illustrations. These topics include land, water, and food sovereignty; more-than-human communities; extractivism; and coloniality. We also draw on our experience in the four case studies to propose some lines of reflection regarding the positionality of *climate (im)mobilities* researchers in the current context. The article concludes with some final remarks.

A final theoretical remark before moving to the next section. As will be seen, when referring to the human mobility-climate change nexus, we will use the category *climate (im)mobilities* throughout the following pages. In doing so, we align with key elements of the research agenda proposed by Wiegel et al. (2019) and Boas et al. (2019), which draw on important contributions from critical approaches to this topic:

1. Migration and other forms of human mobility have been common phenomena in human social organization throughout history (and even before).

2. There is no direct causality between climate change and human mobilities; rather, there are complex interactions between them, entangled with multiple sociohistorical processes.

3. There are different types of human mobilities associated with climate change that differ in temporality, scale, trajectory, destination, degree of voluntariness, planning, and other factors.

4. There are also multiple forms of immobilities associated with climate change—meaning remaining in contexts of high climate-related risk—which may be voluntary or involuntary.

2. Methods

The empirical material used in this article comes from four case studies conducted between October 2024 and June 2025 in Bolivia, Peru, and Ecuador, as part of the Climate Crisis and Mobilities Governance in the Andean Region project.[1] The case studies were carried out in partnership with local organizations that had established prior engagement with the participating communities, and under the theoretical and methodological guidance of the project's core research team.[2] The cases and partner organizations were selected through a semi-open call that required applicants to secure endorsement from the respective community. Cases and partners selection followed a purposive sampling strategy (Bonilla-Castro & Rodriguez, 2005), prioritizing: (a) the presence of observable interactions between (im)mobilities and climate-change impacts; (b) the prior work of local researchers with the community; and (c) the theoretical potential of each case. Although this selection strategy may entail limitations regarding representativeness, it was essential for ensuring sustained community involvement throughout the research process.

Data collection employed a qualitative approach involving three types of techniques: participatory mapping workshops, semi-structured interviews, and focus groups. Participants for the workshops were convened by the community itself, usually in the context of regular assemblies or other participatory spaces. After presenting the research objectives and receiving participants' feedback and collective consent, we proceeded with the workshop, which aimed to characterize what participants considered the main features of their territory, its key problems and conflicts, and the actors involved. The workshop design followed the guidelines of Risler & Ares (2013).

Semi-structured interviews (20 for each case) were conducted with three categories of actors: (a) non-community actors (typically Non Gubernamental Organization staff, local authorities, or similar stakeholders); (b) community leaders (recognized as such by other members); and (c) individuals or families with mobility experience. For each case we carried out two focus groups: one aimed at capturing the community's collective voice, with participants of diverse ages and genders, and another targeting a specific group identified as relevant by the local

1 See more at: https://flacso.edu.ec/movilidadesclimaticas/

2 La Merced community (Aija, Perú): Diana Santos (Eclosio), Eliana Antezana and Fresia Pérez (Young Professionals for Agricultural Development (YPARD) Perú). The Uru Murato people (Oruro, Bolivia): Alfonso Hinojosa y Marcelo Jurado (Instituto de Investigaciones Sociológicas Mauricio Lefebvre), Carol Rocha (Centro de Ecología y Pueblos Andinos). The Sacha Community (Cotopaxi, Ecuador): Céline Le Flour, Cristian Toscano and Iván Soria (Organización Mano Verde). Belén Bajo (Iquitos, Perú): Maritza Mayo (CONURB-PUCP) and Gabriela Vildosola (Acuerdo por Iquitos).

research team (e.g., women, youth or people with mobility experience). Both interviews and focus groups used purposive sampling, complemented by snowball sampling for participant identification.

The data collection instruments were developed through the operationalization of the main categories of a theoretical framework built after a series of internal discussions within the core team and two workshops held with the local teams. The information was subsequently processed through a coding procedure based on these initial categories, along with additional categories that emerged during fieldwork. Coding was conducted using qualitative data analysis software.

Security and ethics protocols were specifically designed for the project and were shared with the local teams. Verbal consent was obtained before the application of each instrument. Interview excerpts presented in this article were translated from Spanish by the author, with minor stylistic adaptations deemed necessary to preserve their intended meaning.

3. The Identity Marks of Latin American Political Ecology

In the Latin American context, political ecology emerged as a response to the proliferation of environmental conflicts resulting from the consolidation of the region as a commodity exporter in a global scenario marked by an exceptional increase in the demand for energy and materials (Forero, 2023). To understand the multiple dimensions of these conflicts, Latin American scholars drew upon several intellectual traditions, ranging from Brazilian critical geography to decolonial and dependency theory. In an important contribution to the field, Moreano et al. (2017) sought to characterize LAPE through what they described as its "identity marks:" the centrality of the category of territory, its decolonial approach, and the positioning of LAPE researchers.

To begin with, the centrality of the category of territory acquired increasing relevance in descriptions of the perseverance of Indigenous and Afro-descendant communities in their struggles against the expansion of extractive activities into their traditional spaces. As extensively documented by LAPE scholars, this strong attachment is grounded in a complex relationship in which not only the land but entire ecosystems—together with the people—form "more-than-human communities" (Escobar, 2015), held together by history, culture, and spiritual practices, as well as by biophysical interactions and, ultimately, existential interdependence.

A fundamental dimension of these interactions is food sovereignty. Agricultural activities, as well as fishing and hunting, constitute key components of the ways in which land and territory are linked to the livelihoods of Afro-descendant, Indigenous, and peasant communities. For this reason, LAPE has dedicated considerable effort to understanding the numerous transformations in agri-food systems in recent decades (Rossi, 2023).

The second identity mark of LAPE is the distinctive presence of a decolonial approach. By the mid-twentieth century, dependency theory scholars described the political and economic effects of the configuration of the world economy, in which peripheral economies were relegated to the extraction of raw materials. More recently, important contributions from ecological economics have underscored that this configuration also constitutes a form of unequal metabolic exchange, through which there is a net transfer of energy and materials from the South to the North (Martinez Alier & Walter, 2015). The deepening of this process is closely tied to the emergence of what is now referred to as extractivism (Forero, 2023).

Aníbal Quijano (2014) added an important layer to this analysis by arguing that the configuration of the world economy—and, therefore, of capitalism—entailed an additional axis of the division of labor, constructed through the category of race. Different forms of labor exploitation were imposed on populations according to the racial classification system established by the colonial order. Despite the formal end of colonial rule, coloniality persisted through multiple mechanisms of exploitation and discrimination grounded in the same classificatory logic.

A related topic derived from this identity mark is the ideological role of concepts such as development and progress. Quijano (2014) also showed how coloniality operated through dichotomies such as traditional/modern, magical/scientific, and primitive/civilized, shaping what he termed the coloniality of knowledge.

Finally, the third LAPE identity mark identified by Moreano et al. is the *positionality* of LAPE researchers. This notion has a twofold meaning. On the one hand, it emphasizes that LAPE scholars maintain a deep awareness of the *situated* character of their intellectual production (Moreano et al., 2017). On the other hand, their understanding of how knowledge production operates within political struggles has led them to take explicit positions in favor of the exploited and oppressed. This stance has given their academic work exceptional vitality and has allowed them to exert a decisive influence on recent Latin American popular struggles.

In the following sections, and drawing on our four case studies, we explore how LAPE's identity marks can contribute to regional and global discussions on the interplay between climate change and human (im)mobilities.

4. Climate (im)mobilities and Food Sovereignty in the Andes

The colonial order established in Latin America at the dawn of capitalism was based on the expropriation of land from its ancestral inhabitants. Formal independence did not resolve this problem; in fact, it often exacerbated it, as local white elites took control of the emerging nation-states and subsequently used state power to expand their properties at the expense of the small parcels of land previously reserved for Indigenous communities by the colonial empires (Quijano, 2014, pp. 816-823).

The result was the consolidation of deep inequality in the region's rural areas, where different forms of semi-serfdom persist even today (Pástor Pazmiño, 2019). Although some land reforms were implemented and, in most countries, Indigenous territories were formally recognized by the state, land inequality has remained one of Latin America's defining features. Today, 1% of productive units in the region control more than half of all productive land. By contrast, although they represent 80% of productive units, small farms—predominantly owned by racialized populations—control barely 13% (Guereña, 2016). Similar inequalities are evident in access to key resources such as water, technology, infrastructure, and technical assistance. As a result of this structural inequality, Altieri and Nicholls have noted that "most climate change models predict that the damage will be disproportionately shared by small farmers in the developing world, and particularly by farmers who depend on unpredictable rainfall patterns" (Altieri & Nicholls, 2009, p. 5[3]).

3 All the verbatims have been translated by the author.

This trend appears to be confirmed by a growing body of literature showing how the hardships caused by the impacts of climate change are reshaping mobility patterns that have historically characterized rural Latin America. A 2021 International Organization for Migration (IOM) report compiling evidence from 228 sources on various types of climate-related mobility found that small farmers are among the groups most affected by climate-related disasters and that the resulting deterioration of their livelihoods often triggers mobility processes (Yamamoto et al., 2021). Another report, produced jointly by the same organization, documented similar dynamics in Chile, Bolivia, and Peru (Escribano Miralles & Piñeiro, 2022). As several scholars have argued, factors such as the unequal distribution of land and the absence of policies aimed at addressing preexisting vulnerabilities influence how biophysical factors affect people and communities in rural Latin America (Rivera et al., 2023; Radel et al., 2018; Flores-Palacios et al., 2023).

Consider Sacha, located in Cotopaxi (Ecuador), at more than 3,000 meters above sea level, as an illustrative example. Sacha is an Indigenous community whose territory overlaps with Llanganates National Park, a protected area whose hydrological resources are crucial for the country's water security. Rural life in Cotopaxi is marked by the inequalities described above. After the abolition of the huasipungo—a system of serfdom imposed on Indigenous communities during colonial times—in 1964, a land reform distributed small plots to Indigenous and peasant populations. Nevertheless, the amount of redistributed land was insufficient, and many Indigenous communities remained in poverty, with some members seeking employment in the agro-export activities of former haciendas (Martinez, 2015). Inequality extended beyond land distribution and has also been replicated in access to water, threatening the continuity of small-scale agricultural production in the context of climate change. As one community member explained to us:

> Irrigation water is distributed in this way: 60% for the hacendados, and 40% for the 3,000 inhabitants of the area. This is a big disadvantage for us: they have water reservoirs; they have those access rights to water granted by the institution in charge [...]. We instead have a small amount of water that we are trying to distribute, but it is not enough... (Sacha community leader, personal communication, 28/11/24)

Thus, water scarcity is a serious problem for the Sacha community members and has become an important reason for migrating abroad. Although the community has a longstanding tradition of international migration, these mobility dynamics have tended to increase during periods of economic hardship and then decline when local conditions improve (Le Flour et al., 2025). In recent years, and especially since the pandemic, there has been a new peak in the number of people migrating:

> Well, among the main reasons for them to migrate were the economic conditions, their poverty. We are not starving here, but they look for stability. What they find abroad, in other countries, is stability. We don't have it here. Look, I am cultivating potatoes; if I don't water them, they will be lost, and how much money do you think is invested here? [...] With all this problem of rainfall scarcity, at one moment or another, there will be a terrible hailstorm. And if this crop is lost, we will be economically beaten. (Sacha community member, personal communication, 10/11/2024)

A similar dynamic is occurring more than 1,500 km away, in the community of La Merced in Ancash, Peru. Although the Peruvian agrarian reform of 1969 initiated a long process of land

expropriation and redistribution, this process was reversed over the following decades, turning the country into yet another example of extreme inequality: despite representing 79.3% of productive units, smallholdings controlled only 5.9% of the total arable land in 2016, with an average size of 1.3 ha (Guereña, 2016, p. 26). In Ancash, most productive units are smaller than 5 ha. Properties of this size are insufficient to support a family and usually do not receive credit or technical assistance for key components of agricultural production, such as irrigation. In this challenging context, Ancash has witnessed a substantial decline in its rural population over the past decade (Sánchez Aguilar, 2015, p. 52).

At the same time, the region has experienced disasters attributable to climate change, from sudden-onset events such as the floods and landslides triggered by Cyclone Yaku in 2023, to slow-onset events related to alterations in rainfall cycles, including a significant decrease in precipitation (Aliaga Guerreros, 2024). These factors have made agricultural activity increasingly precarious. This uncertainty, combined with the low social value attributed to agricultural work, has intensified the exodus to cities. As one farmer told us, describing the growing water stress he has witnessed over his lifetime:

> Nowadays our small *puquiales*[4] are getting dry, so we have to go to other places to bring this element to supply our population requirements [...]. This is the main concern, the issue of water. When I was a child, even 50 years ago, there was always water. When I was a child there was always enough. Decade by decade its availability has been decreasing. (Peasant from La Merced, personal communication, 10/11/2025)

These shifts in water availability have become one of the key reasons why the inhabitants of La Merced—particularly younger generations—are relocating to the cities: "Suddenly they move to Huaraz or Huarmey because of the drought; people say, 'we'd better leave because there is no more water'" (Community leader from La Merced, personal communication, 10/11/2024). As a result, the community's social reproduction is now seriously at risk:

> I believe that things can get worse, because it is not possible to understand the weather anymore. For example, look, it is very cloudy, but we don't know when the rain is going to be back again. This month it may rain, but what about the next one? I believe we will end up with no people here. (Peasant of La Merced, personal communication, 09/12/2024)

As mentioned above, the colonial past of Latin America produced extreme inequalities in land rights that have shaped contemporary rural life. These inequalities have also been reflected in access to water, technological assistance, and other key inputs for agricultural production (Altieri & Nicholls, 2009). The transition to neoliberalism further aggravated the material conditions of the region's peasants, who responded with new forms of political organization. At the turn of the century, vibrant Indigenous and peasant social movements converged in what later became La Vía Campesina, a coalition that opposed the expansion of agribusiness and advanced the notion of food sovereignty. This concept challenged neoliberal approaches to food production and distribution based on trade, promoting instead national and local

4 Wellsprings in Quechua.

production as well as the sustainable preservation of rural life, economies, and environments (Martínez-Torres & Rosset, 2010).

In a context where transition to sustainability appears as a key component of climate action, the project of La Via Campesina seems more pertinent than ever. Today, however, the struggle for food sovereignty in the region must confront not only agribusiness but also the many challenges imposed by climate change and the associated depopulation of rural areas.

The cases of La Merced and Sacha seem to suggest that water availability and distribution are among the most pressing issues in this context. There is an important body of literature addressing conflicts related to this vital resource in the region from a "political ecology of water" perspective (Alba et al., 2025; Boelens et al., 2023). Therefore, an analysis of the reconfiguration of (im)mobilities in rural areas in the context of the climate crisis would greatly benefit from an engagement with the existing literature on the political ecology of both food and water.

5. Displaced by Territory Loss: The Uru Murato and the Poopó Lake

As extensively discussed by LAPE authors, the cultures of Indigenous and Afro-descendant communities in Latin America are often rooted in "relational ontologies," where humans and non-human beings inhabiting a given territory are constituted through their interactions and therefore do not have an existence that precedes or stands apart from these relationships (Escobar, 2015, p. 30). In these ontologies, "when they speak of a mountain or a lake or a river as an ancestor or as a living entity, they are referencing a social relationship, not a subject–object relationship" (Escobar, 2015, p. 33). Through these interactions, they thus form "more-than-human communities."

This is an important issue for LAPE, especially since biodiversity loss constitutes one of the most critical dimensions of the current environmental crisis (Almond et al., 2022). As several scholars have argued, these community bonds are crucial for understanding people's struggles against the drivers of environmental destruction (De la Cadena, 2010). Despite its importance, this issue has been scarcely explored in the literature on climate change and human (im)mobilities, with the work of Gini (2025) being an important exception. In what follows, we explore this connection using the case of the Uru Murato as an example.

The Uru Murato people are an Indigenous community that for centuries has occupied Lake Poopó and its surroundings. This waterbody is the second-largest saltwater lake in Bolivia, after Lake Titicaca. Titicaca and Poopó are connected through the Desaguadero River, forming a watershed shared with Peru. This hydrological system is particularly fragile, as two of its waterbodies—Lakes Uru Uru and Poopó—are very shallow and depend heavily on precipitation (Ministerio de Medio Ambiente y Aguas, 2015).

The Uru Murato are one of the oldest Indigenous communities in Bolivia, with a history that can be traced back at least 2,000 years. Although their territory has changed substantially over time, Lake Poopó has always been an important component. For a long period, the Uru Muratos lived on the lake's waters, on islands woven from Totora. This significance increased in the second half of the 20th century, when the expansion of the Aymara—the largest Indigenous community in modern Bolivia—forced the Uru Murato to concentrate around the lake.

Since then, Lake Poopó became their almost exclusive source of livelihood, reinforcing their identity as *people of the water*. For decades, hunting and fishing have been their main economic activities, especially because the Aymara monopolized the arable land around the lake (Hinojosa et al., 2025).

Tragically, between 2014 and 2015, Lake Poopó practically disappeared, in an event described by the Uru Muratos as something that happened from one day to the next. The effects of climate change have played a fundamental role, especially due to an increase in evapotranspiration (Abarca-Del-Rio et al., 2012). Other anthropogenic factors—especially polymetallic mining (Andreucci & Gruberg, 2015) and the overexploitation of the Desaguadero River for intensive agriculture, particularly quinoa crops oriented towards international markets (Satgé et al., 2017)—also contributed to its disappearance.

As a result, the Uru Muratos lost their livelihoods, becoming unable to hunt or fish. This drastic transformation forced them to seek ways of surviving in the precarious labor markets of nearby cities, with men often working in construction and women in domestic labor. Some men had to seek employment in the mining sector, where they face multiple physical hazards, from mine collapses to silicosis. In a few cases, some Uru Muratos have found work in the agricultural activities of their Aymara neighbors, where they are underpaid and frequently humiliated (Hinojosa et al., 2025). Consequently, the Uru Murato settlements have lost most of their inhabitants, especially those of working age.

This case illustrates that climate (im)mobilities may, in some instances, relate to the practical destruction of people's territories. The geographical space remains, but the "web of life" (Moore, 2015) that constituted it has faded away. The Uru Murato, Lake Poopó, and the multiple beings that formed its ecosystem were tied by an existential interdependence. The consequences of the lake's disappearance were clearly expressed by one of our interviewees: "For us, the end of the world has come, because for us, the world was that: hunting and fishing" (Uru Murato leader, personal communication, 30/11/2024). It is not difficult to understand how limited the category of livelihoods is for representing what they lost:

> Before, there were wild birds here, and there were our experiences too. I used to eat araquesha; there was jola as well [...]. There was medicine, churro, and titi; now there are no more. Only a few animals are left... (Uru Murato community member, personal communication, 28/11/2024)

The notion of "more-than-human communities" proposed by LAPE is particularly relevant for understanding their mourning, as expressed by another community member: "As hunters and fishers, we said that we would never forget our lake, because the lake was our mother and father" (Uru Murato community leader, personal communication, 30/11/2024).

This recognition of the lake as a community elder is embedded in their cosmovision, in which she is called *Mama Quta* (Mother Lake). Together with the *Jalsuris* and *Juturis*—entities of the lake—she constituted the center of the Uru Murato spiritual world (Hinojosa et al., 2025).

The territorial loss experienced by the Uru Muratos exemplifies how climate injustice operates by linking local and global dynamics. The effects of global capital accumulation—from greenhouse gas emissions to mining and the expansion of intensive agriculture for international markets—intertwine in a process of environmental destruction that is simultaneously cultural and communal, forcing them to relocate to urban areas in search of precarious em-

ployment to survive. They have lost not only the ecosystem and their livelihoods, but also a crucial part of their community. Because their collective being as Uru Muratos was shaped through interactions with the lake, the fish, and other beings now gone, they have also lost a significant part of their identity and self-esteem. Any assessment of loss and damage associated with the displacement of the Uru Muratos must take this into account.

6. Extractivism and Climate (im)mobilities

As mentioned before, extractivism has been one of the most important topics in LAPE scholarship. Although there is no single definition of the term, it can be broadly described as a substantial increase in the extraction of energy and materials at the end of the century, driven by the dynamics of global capital accumulation (Forero, 2023). Because extractive activities tend to occur in the territories of Indigenous, Afro-descendant, and peasant communities, they have become a source of social conflict and environmental hazard. In the case studies mentioned earlier, extractivism appears to be an aggravating factor of the impacts of climate change on rural communities. More importantly, the extractive sector emerges as a potential beneficiary of the (im)mobility processes generated by these same effects.

Let us begin by examining its role as an aggravating factor of climate change impacts. In the case of the disappearance of Lake Poopó, mining activities were pivotal. A study published in 2012 calculated that, by that time, the lake was receiving 3.3 million tons of debris per day from mining activities in the basin, which substantially contributed to the reduction of its depth (Navarro et al., 2012). Mining has also been a major source of water contamination, affecting both biodiversity and the surrounding communities (Andreucci & Gruberg, 2015).

We also found that mining acted as an aggravating factor of climate change effects in Aija. As some local peasants affirmed, mining activities in the area are reducing both water quality and availability:

> Also in Machay, there is water contamination from mining activities. The same occurs in Ullucurán, Rurimarac, and Llactún. I think the mining company has paid them, which is why they remain silent about it, but the water is contaminated. In this watershed, there are neither trout nor frogs; all have disappeared because of this pollution. (La Merced community member, Participatory mapping workshop, 03/11/2024)

This was confirmed by a community leader:

> We are all affected because there is no water. Now it is worse due to mining pollution, especially from informal miners in the mountains [...] Mining is a hazard as well; illegal mining is affecting us, and they are polluting the water. (La Merced community leader, personal communication, 09/11/2024)

This pollution is threatening agricultural activities, according to a local environment specialist:

> If you look at the Pescado River, which runs across the urban area of Belén, you can still see a few bioindicators of water quality, like algae or frogs in some parts of the river. But when you compare it with the other rivers in Aija, you won't see that. The water quality there is quite degraded, and it is insufficient for the proper development of agriculture.

> (Local government specialist in environmental management, personal communication, 13/11/2024)

Paradoxically, as water availability decreases and agricultural activities become less viable, mining emerges as an alternative source of income—particularly for the younger population. As we were told in Aija: "the younger people realize that the Huinac mine is nearby. Once they finish school, they see that there is money there, so they move, because they can find employment there" (La Merced community leader, personal communication, 10/11/2024).

Older community members, however, are reluctant to follow this path, as they are more aware of the potential health impacts associated with mining:

> Some older people don't want to go to the mine because they are more prone to intoxication; their lungs get affected and all of that, and this is due to contamination. Some go anyway, because they have to, because of their needs—that's what they do... (La Merced community member, personal communication, 12/11/2024)

In Bolivia, the Uru Murato are also aware of the dangers associated with mining activity, yet they seek employment there because it has become almost their only option now that fishing and hunting are no longer possible:

> Men have changed their activities because they used to be fishers. For example, you say that mining is hard—yes, that's true; of all the occupations men have, mining is the most difficult. It's hard work, and sometimes they die when the mine collapses. Working in the mine comes with a cost... (Uru Murato community member, personal communication, 29/11/2024)

Those examples illustrate the complex interactions between extractivism and climate change at the local level. Climate change effects increasingly threaten the livelihoods of Indigenous and peasant communities, particularly through the water stress caused by changes in rainfall patterns. At the same time, the expansion of extractivism—especially mining—contributes to this same problem through increased sedimentation of waterbodies, resource overexploitation, and pollution. These growing pressures stimulate the exodus of segments of the local population toward urban areas, weakening community resistance to extractivist expansion. Meanwhile, extractive activities become one of the few remaining economic opportunities for those who stay, forcing them to engage in the very same activities that have destroyed their territories and traditional livelihoods.

There is no doubt that interactions between climate change and extractivism will intensify in the coming decades, particularly in the Global South. For example, Klepp and Fröhlich (2020) highlight the need to consider, within the climate (im)mobilities research agenda, the *second-order effects* of climate policies, referring to potential displacements associated with extractive activities aimed at supplying strategic minerals. This is particularly relevant in the case of lithium, rare earths, nickel, and copper.

In recent years, several contributions to the climate (im)mobilities debate have sought theoretical approaches capable of connecting the different dimensions of the global environmental crisis, of which extractivism is one. For instance, Lustrum and Bose (2022) have proposed the category of "displacements in the Anthropocene," while Boas et al. (2023) refer to the

"environmental change and human mobility nexus." These perspectives enable a theoretical connection between two phenomena that are deeply intertwined in the everyday experiences of Global South communities.

Furthermore, as suggested by Whyte (2017), both climate change and extractivism should be understood as dimensions of colonialism. Given the extensive literature on extractivism produced by LAPE, fostering dialogue between these two research fields will be highly fruitful for the analysis of climate (im)mobilities in Latin America and beyond.

7. Coloniality and Climate (im)mobilities

As mentioned before, the notion of the "coloniality of knowledge" (Quijano, 2014) refers to a system that classifies forms of knowledge based on dichotomies such as traditional/modern, magical/scientific, or primitive/civilized, thereby delegitimizing the knowledge, perspectives, and practices of Indigenous, Afro-descendant, rural, and poor communities. This is not only unjust but also constitutes a major obstacle to climate action, as these knowledge systems and practices are recognized as crucial for addressing the challenges posed by climate change (Intergovernmental Panel on Climate Change, 2022). We observed the effects of the "coloniality of knowledge" in all the contexts where we conducted research. In this section, we briefly describe how it is manifested in two of our case studies.

Let's start with Sacha. As mentioned earlier, the territory of this Indigenous community overlaps with Llanganates National Park. Ecuadorian law recognizes Indigenous territories and grants communities the right to carry out activities according to their traditions, culture, and identity (República del Ecuador, 2008). Nevertheless, with the declaration of the park as a protected area in 1996, it became part of the National System of Protected Areas under the administration of the national environmental authority. The Sacha community, however, does not recognize this as legitimate. As one of its members explained:

> For political reasons, they decided not to expropriate but to "share," declaring the national park as a reserve. But this violates the community's rights. It is basically a way for the state to expropriate land that historically belonged to the communities. (Sacha community member, personal communication, 9/11/2024)

In practice, this meant excluding the community from managing the park, disregarding their historic role as stewards of the territory:

> Now, with the arrival of the Ministry of Environment, things have become complicated. Before, we ourselves took care of the páramo. We observed it and monitored it without any problems. Now, to build an irrigation ditch for our own use, we have to request authorization from the Ministry. (Sacha community member, personal communication, 9/11/2024)

This practical nullification of the community's territorial rights, and the resulting lack of trust, has hindered the development of an effective and just approach to the environmental challenges faced by the national park. Two practices illustrate this tension: cattle farming and agricultural burning, both considered traditional by the communities.

Cattle farming has become an increasingly common form of "maladaptation" (Barnett & O'Neill, 2010) in Andean páramos. As agricultural activities have become more challenging due to changing rainfall patterns, cattle raising has offered a less labor-intensive alternative for investing remittances sent by community migrants. It has provided a relatively secure source of income through milk and meat production. As described by a community member: "Around 2006 or 2007, when agriculture became less profitable, we shifted to cattle raising, especially milk production, which became our main activity. We stopped sowing, and all the areas we used to cultivate turned into pasture" (Sacha community member, personal communication, 10/11/2024).

Agricultural burning, in contrast, is a response to land scarcity. As agribusiness expands and pushes communities into higher-altitude areas, burning becomes a mechanism for extending the agricultural frontier. This practice has been passed down through generations and is regarded as part of the community's traditional agricultural methods: "Before, the *páramo* was cared for through burning. By burning the wasteland, new sprouts appeared, creating pasture for animals. Now, however, everything is dying. Animals are dying, and there is scarcity, unlike before" (Sacha community member, focus group, 30/11/2024).

Although these practices are implemented as strategies to cope with increasingly harsh climatic conditions, they are considered a threat to the ecosystem. As suggested by Le Flour et al. (2025), this should be understood as a case of "maladaptation" (Barnett & O'Neill, 2010). Yet state measures aimed at environmental protection overlook the needs of the community, depriving them of livelihoods and limiting their right to remain. As one member explained:

> Before, there was cattle in the *páramos* People lived there. Now, with the national park, the authorities forbid animals, claiming they destroy the environment. As a result, there are neither people nor animals; there is no rain, and the páramos are drying. We are alone, abandoned. (Sacha community member, personal communication, 10/11/2024)

Thus, the Sacha community faces a dual challenge: water stress due to climate change and increasing land-use restrictions justified by conservation. This combination limits their options for surviving in their ancestral territories, making migration one of the few viable alternatives.

Another example of the coloniality embedded in climate-mobility governance is the Nueva Belén relocation project in Iquitos, implemented by the Peruvian central government since 2018. Iquitos, the capital of the Loreto province, is surrounded by floodplains along the Itaya, Nanay, and Amazonas rivers. One of its most populated neighborhoods, Belén, hosts around 90,000 inhabitants in Belén Alto and Belén Bajo. Belén Bajo lies in the Itaya floodplain near the port and markets. Its residents are mostly of Indigenous and riverside origin.

Belén Bajo's settlement emerged around the 1940s, with homes either floating or built on stilts, allowing inhabitants to cope with seasonal river fluctuations. The inhabitants were primarily fishers and hunters, accustomed to the seasonal dynamics of the Amazonian rivers. Following the region's architectural traditions, their homes were either floating—constructed on logs—or built on stilts. This type of architecture enabled them to adapt to the landscape changes caused by the regular flooding and recession of the Itaya River. Owing to this distinctive feature, Belén Bajo has often been described as an "amphibious community," highly adaptable to river fluctuations (Vildósola et al., 2022, p. 3). Gradually, wood was replaced by concrete, but houses remain on stilts, with improvised bridges and boat-based mobility. Despite these adaptations, challenges persist, especially regarding sanitation. Floodwaters carry

waste into homes, creating unsanitary conditions: "There is a lot of waste that comes with the water... and the government doesn't help to remove it. Rats and other animals spread disease. Several people have died from leptospirosis and similar illnesses." (Belén Bajo inhabitant, personal communication, 14/11/2024).

The situation worsened with two major floods in 2012 and 2015, which affected thousands of homes and forced temporary relocations. In response, the government launched a relocation project, moving 2,600 families to Nuevo Belén, located 21 km from the city center in an area known locally as Varillalito (Lavell et al., 2015). After seven years, however, only 397 families had relocated, and many regretted doing so.

One major cause of this failure is the divergent perception of risk: whereas state officials view floods as a threat and an obstacle to development, residents regard them as part of life and even as a resource, for example, for fishing or soil fertility (Gorenstein, 2018). As one neighborhood leader told us: "We know both flooding and dry seasons. I don't see any problem. I even had a boat before..." (Belén Bajo leader, personal communication, 27/10/2024).

Distance from the market also undermined the relocation effort: the port is central to residents' livelihoods, connecting Belén Bajo with surrounding communities and with the city. As a local leader explained:

> The port of Belén is the center of all activity here. It's the entry point for fish, plantains, yucca, and charcoal. So, no matter how they describe Varillalito, it just won't be the same. It can't be compared to a port that connects us to the Itaya, the Amazon, or the Nanay rivers—we are surrounded by them here... (Belén Bajo leader, personal communication, 27/10/2024)

Residents value their way of life and consider their traditional knowledge—ranging from the use of bioindicators of flooding to architectural adaptations—as effective tools for coping with environmental variability. The government's disregard for these perceptions and practices resulted in an intervention that was both costly and ineffective. Risk management and adaptation efforts in Belén must therefore begin by acknowledging residents' ties to the river and the market, as well as the potential contributions of their amphibious way of life to the sustainable adaptation of floodplain communities in Iquitos.

The cases of Belén and Sacha illustrate the importance of incorporating Indigenous, Afro-descendant, and local knowledges and perspectives into adaptation and resilience strategies. As Whyte (2017) argues, communities possess the capacity to envision futures and devise strategies in response to climate change, and these processes can strengthen their self-determination and agency. Moreover, such recognition and participation are *sine qua non* conditions for the emergence of transformative resilience and adaptation strategies (Garcia et al., 2022).

8. On the Positioning of the Climate (im)mobilities Researcher from a LAPE Perspective

As we have seen, the socio-environmental dynamics arising from the interaction between climate change and human (im)mobilities clearly constitute an issue of climate (in)justice. This raises an important ethical question regarding the role of the researcher, particularly when

examined through a Latin American Political Ecology (LAPE) lens. Here, we briefly reflect on three points inspired by the LAPE framework for researcher positionality.

The first point concerns the geopolitics of the research field. As several scholars have noted —and as introduced at the outset of this article— much of the global interest in climate (im)mobilities stems from the politicization of migration and refugee issues in the Global North. This dynamic often reproduces, within research funding agendas, the "climate migration myths" (Boas et al., 2019) that critical scholarship has problematized in recent years. As a result, policy debates tend to focus narrowly on resilience, adaptation, and loss-and-damage compensation, while neglecting other essential dimensions such as mitigation, climate and environmental justice, just transitions, and the human rights both to move and to stay. The first challenge for researchers, therefore, is to ensure that funding priorities do not restrict or dilute critical perspectives, while maximizing the room for maneuver available to design and conduct research agendas grounded in the intersection of climate justice and mobilities justice (Sheller, 2020; Martínez et al., 2024).

The second point relates to the imperative of strengthening the dialogue with LAPE. This requires foregrounding the relationships between climate (im)mobilities and processes of coloniality, extractivism, and food sovereignty. Climate change cannot be analytically separated from fossil fuel extraction, and fossil extraction consistently produces biodiversity loss, territorial dispossession, and displacement effects disproportionately borne by racialized and marginalized populations. The same is true for energy transition processes when they reproduce forms of green colonialism (Lang et al., 2024). It is therefore essential to deepen our understanding of how extractivism shapes climate (im)mobilities, situating human displacement within broader socio-environmental power structures.

Finally, a LAPE-informed approach calls for adopting participatory action research methodologies, one of the most significant contributions of Latin American scholarship to the social sciences (Fals Borda, 1987). This approach links knowledge production with community organization and mobilization, enhances climate awareness within civil society, and actively engages in climate action to foster transformative change. In practice, it requires researchers not only to analyze the social and environmental dimensions of climate (im)mobilities but also to contribute to processes that empower affected communities and promote justice-centered solutions.

9. Conclusions

This article has sought to explore how Latin American Political Ecology (LAPE) can contribute to a better understanding of climate (im)mobilities. Evidence from case studies in the Andean region, the Bolivian Altiplano, and the Peruvian Amazon illustrates that climate (im)mobilities cannot be understood in isolation from the structural conditions of inequality, extractivism, and coloniality that shape communities' access to land, water, and other critical resources. Indigenous, Afro-descendant, and peasant populations are disproportionately affected by the impacts of climate change, while their knowledge, practices, and territorial claims are frequently delegitimized under prevailing governance frameworks.

Our cases indicate the need to examine the interactions between climate (im)mobilities and agrifood systems. A growing body of literature describes how rural communities in Latin America resort to mobility strategies as a means of coping with increasing climate-related risks

(Gray, 2009; Milan & Ho, 2014; Radel et al., 2018; Flores-Palacios et al., 2023). These dynamics have significant consequences for food sovereignty in the region, given that small-scale production led by peasant, Indigenous, and Afro-descendant farmers has played a fundamental role in local and national food supply. Such agrifood systems have been essential for the preservation of biodiversity, traditional knowledge, and sustainable practices (Toledo & Barrera-Bassols, 2008). Increasing mobility from rural areas to urban centers poses risks to the conservation and flourishing of this heritage—precisely when it is needed most—thereby threatening the resilience and adaptive capacity of the region.

We also highlight the need to explore the intersection between climate (im)mobilities and extractivism, one of the main topics in LAPE (Forero, 2023). In three of our case studies, we observed that extractivism and climate change converge in ways that threaten community livelihoods, increasing the likelihood of migration to urban areas. Given that extractivism is a pressing issue in Latin American rural territories (Svampa, 2012), this is unsurprising. In those places, extractivist activities benefit from the climate-related crises affecting small-scale farming, as they increase the available labor force. In a context of rising demand for strategic minerals, which is expected to further expand extractivist activities in the region, the depopulation of rural areas may reduce the capacity of communities to resist such pressures.

The displacement of the Uru Muratos, resulting from the near disappearance of the Poopó Lake, highlights the importance of understanding the connection between forced (im)mobilities and territorial loss through the lens of "relational ontologies" (Escobar, 2015). Considering the "more-than-human" character of many communities in Latin America and beyond may be fundamental for assessing the full scale of loss and damage generated by these processes. This approach is also essential, as suggested by Gini (2025), when designing adaptation and resilience strategies for communities facing high levels of climate-related risk.

Finally, identifying how the coloniality of knowledge influences climate action in specific contexts—leading to the disregard of traditional and local knowledge—encourages us to draw inspiration, in research on climate (im)mobilities, from the *positioning* that has characterized LAPE researchers for decades. This entails not only the effort to develop situated knowledge and the use of participatory research approaches, such as Research-Action-Participation (Fals Borda, 1987), but also direct involvement in community struggles to defend their territories and resist colonialism.

Data Access Statement

The data used in this research can be requested directly from the corresponding author, provided that the request is reasonable and properly justified.

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