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Complicating the tale of 'first climate migrants': Resource-dependent livelihoods, drought and labour mobilities in semi-arid Chile

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ABSTRACT

While stories of 'climate migrants' regularly make the news, local perspectives often paint a different picture of migration motivations. Based on the case of 'Chile's first climate migrants' from Monte Patria, an increasingly drought-affected rural municipality characterised by its agricultural economy, this article argues that mobilities under climate change need to be understood through a power-sensitive approach analysing both local perceptions of environmental changes and power relations extending beyond the case-study level. Through the combination of the environmental mobilities approach with a political ecology of climate change, this article studies how (a) precipitation deficits are translated into locally perceivable effects through the Chilean water distribution system, (b) how these effects impact different socio-economic groups differentially, and (c) what options – including (labour) mobilities – locals perceive to have for responding. Ethnographic fieldwork in Monte Patria, including 39 semi-structured interviews and 11 follow-alongs, has shown that uneven resource access, limited political bargaining power and the perceived impossibility to earn a sufficient income in the agricultural economy are locally considered as more important reasons for engaging in mobilities than considerations about climate change (adaptation). As prolonged droughts aggravate the existing structural economic insecurity of local livelihoods, creating a situation under which staying is considered increasingly difficult, the participation in pre-established labour mobility patterns directed outside of the municipality is considered as normal and potentially positive household-level response. The article concludes that these insights can serve to guide climate change adaptation policy-making that is attuned to existing mobility patterns and the importance of resource redistribution.

1. Introduction

As the latest IPCC report (2021) once again emphasises the rapidly progressing change in global climate, and the news are full of ever-new records on extreme heat, storms, wildfires, droughts and floods affecting all continents, the tremendous effects of climate change on our societies are becoming ever clearer. In this context, 'climate migration' is consistently highlighted in media, NGO and policy arenas as one of the most dramatic societal consequences of climate change, despite long-standing academic critiques on such storylines (Baldwin, Fröhlich, & Rothe, 2019; Bettini, 2013; Boas et al., 2019). The rising attention to this topic is reflected in news reports from around the world heralding the 'first climate migrants' or 'first climate refugees' from countries as different as Kiribati (McDonald, 2015), the USA (van Houten, 2016), Wales (Wall, 2019) or Greece (van der Ploeg, 2021).

Another example is the rural municipality of Monte Patria, located in central-northern semi-arid Chile, which has been labelled by the national media as the origin of 'Chile's first climate migrants' (Olivares, 2018). This label is based on an IOM report (2017), claiming that severe droughts of recent years have led up to 6000 'climate migrants' – 15 % of the local population – to move away from Monte Patria between 2000 and 2016 to find work outside of the agricultural economy characterising this area. However, while both drought and migration are indeed omnipresent issues in the area, the present study found this 'climate migration' framing has only little resonance locally.

Addressing this discrepancy, this paper provides an alternative reading of the case of 'Chile's first climate migrants', inspired both by the environmental mobilities approach (Boas, Kloppenburg, van Leeuwen, & Lamers, 2018; Sheller & Urry, 2016; Urry, 2007; Wiegel, Boas & Warner, 2019) and by a political ecology perspective to climate change (Eriksen, Nightingale, & Eakin, 2015; Klepp & Chavez-Rodriguez, 2018; Marino & Ribot, 2012; Taylor, 2014). Through this combined lens, the agricultural economy of Monte Patria, with its uneven resource distribution and unstable labour conditions, becomes visible as the factor

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shaping a) local vulnerabilities to climate change, b) the uneven distribution of climate change effects among different socio-economic groups, and c) the options for adapting to the challenges faced by smallholders and agricultural labourers in Monte Patria, which often involve labour mobilities along pre-established patterns. Rather than creating new migration pressures, this paper finds that increasing droughts aggravate existing problems which, in the perception of the local population, render labour mobilities to non-agricultural sector as necessary and potentially positive means for 'living a good life'.

This paper is structured as follows: The next section outlines the theoretical lens of a 'political ecology of environmental mobilities' applied in this study. This is followed by the case description and research methodology. The analysis starts with a focus on local drought perceptions and the effects the Chilean water distribution system under conditions of drought has on different rural livelihoods. Then, the growing importance of non-agricultural livelihoods, why these often necessitate labour mobilities directed outside of the municipality and how they take shape are studied. The paper ends with a discussion of the lessons learned from this analysis for future research and policy making on the climate change-mobility nexus, particularly in rural agricultural settings.

2. Towards a political ecology of environmental mobilities

2.1. From climate migration to environmental mobilities

The debates on the relationship between climate change and migration have evolved substantially over the past two decades, ranging from (rather apocalyptic) 'climate refugee' discourses to a more nuanced and multicausal understanding of migration (for a detailed chronology of the debate, see Klepp, 2017; McLeman & Gemenne, 2018; Piguet, 2013). Recent years have seen a more critical and diverse academic engagement with the climate change-migration nexus. Through different empirical and theoretical foci, these perspectives highlight the context-dependency and multi-scalar workings of power shaping migration in the context of a changing climate, as well as the fragmentation of movements and the significance of non-migration in this context (Adams, 2016; Bettini, 2017; Farbotko & McMichael, 2019; Klepp & Herbeck, 2016; Parsons, 2019; Zickgraf, 2018a). Grounded ethnographic research with a focus on everyday experiences and local perceptions of environmental changes becomes increasingly important (Arnall & Kothari, 2015; Kothari & Arnall, 2019; Parsons & Chann, 2019; Wiegel, Warner, Boas & Lamers, 2021), moving the debate "towards a focus on how the climate is experienced, guides action and creates meaning in doing so" (Parsons, 2019, p. 15).

One theoretical perspective of growing relevance for examining the complicated and multi-layered relationship between climate change and migration is the mobilities approach (Baldwin et al., 2019; Blondin, 2021a; Boas et al., 2018; Gill, Caletrío, & Mason, 2011; Parsons, 2019; Schapendonk & Steel, 2014). Rooted in human geography, sociology and science and technology studies, the mobilities approach is based on the premise that social relations are shaped by the mobilities of people, goods, risks, knowledge and technologies, particularly in our globalised age (Hannam, Sheller, & Urry, 2006; Sheller, 2018; Sheller & Urry, 2016; Urry, 2007). This inspired the 'environmental mobilities' approach to the climate change-migration nexus, which provides a lens for understanding how local effects of climate change relate not only to long-distance migrations, but also to the various small- to medium-scale mobilities people already engage in (Boas et al., 2019; Cundill et al., 2021; Wiegel et al., 2019). Furthermore, this approach emphasises how mobilities and immobilities are interrelated on various scales, from the household to the global level, and intersect with the mobilities of e.g. information, environmental risks and weather events themselves (Blondin, 2021b; Boas, 2020; Parsons & Chann, 2019; Zickgraf, 2018b).

A critical take on mobilities studies focuses not only on the physical movement itself, but also on its representation and practice, or "when, how, and under what circumstances" mobilities take place (Sheller, 2018, p. 51; see also Cresswell, 2010; Parsons, 2017). This allows to analyse and address the uneven distribution of mobility potentials (or 'motility') across populations, which leave some groups with significantly less decision-making power about their im/mobilities than others (Blondin, 2020; Kaufmann, Bergman, & Joye, 2004). By attending to how, according to Cresswell's 'politics of mobilities' (2010), mobilities are simultaneously produced by and productive of the unequal distribution of opportunities and oppression, this perspective has contributed to the development of a power-sensitive research trend on the climate change-migration nexus as called for by authors such as Bettini, Nash, & Gioli (2017), Klepp & Herbeck (2016), Nicholson (2014), and Parsons (2019).

2.2. The political ecology of climate change in a rural context

While we have significantly moved forward in our understanding of the mobility aspect of the climate change-mobility nexus, what often remains undertheorised in this context are the ways in which climate change is translated into locally perceivable effects that guide actions, including mobilities (cf. Elmhirst, Middleton, & Resurrección, 2018; Greiner & Sakdapolrak, 2016; Parsons, 2019). One way to remedy that, this paper argues, is to take inspiration from the scholarship on the political ecology of climate change, which has long emphasised that the societal effects of climate change are far from neutral or straightforward. Political ecology is a highly diverse perspective that as its central tenet holds that human-environment interactions, including crises and conflicts, are products of unequal power relations embedded in specific historical and geographical contexts (Coe, 2021; Eriksen et al., 2015; Greiner & Sakdapolrak, 2016; Taylor, 2014). With regard to climate change, this perspective emphasises that it.

> "must be understood as *both* a disparate set of changing ecological conditions *and* as a set of outcomes filtered through social and political economic circumstances on the ground. Climatic changes take on meaning only as they are integrated into the discursive formations rooted in power relations, competing knowledge systems, and a contentious distribution of wealth and resources." (Marino & Ribot, 2012, p. 325, own emphasis).

From a political ecology perspective, not only do the social and political economic configurations create uneven degrees of contextual and relational vulnerability to climate change, so that its perceived effects often vary across the micro-geographies of access to land or water, social or economic capital (Coe, 2021; Elmhirst et al., 2018; Eriksen et al., 2015; Marino & Ribot, 2012; Greiner & Sakdapolrak 2016; Parsons and Chann 2019; Taylor 2013); they also shape – and limit – the options for adaptation. People's range of possible responses to the adverse effects of climate change are thus "socially embedded and constructed, dependent upon inadequate and unequal societies, or structural failings in economies and politics" (Adey, 2016, p. 41; see also Wrathall et al., 2014).

This perspective to climate change is particularly relevant for rural areas, such as Chilean Monte Patria, due to their livelihood dependency on natural resources. Rural areas are often characterised by "deep-rooted inequalities in control over key productive resources such as land, water, labour and credit" (Taylor, 2013, p. 321) which are further aggravated by climate change. As access and control over key resources are "embedded into a set of power relations, practices, and institutions" (Wrathall et al., 2014, p. 294), the available options for *in situ* adaptation are often limited due to restricted access to the necessary capital.

A number of authors have insightfully applied this political ecology perspective to rural–urban or rural-rural labour migration under conditions of climate change (e.g. Carr, 2005; Greiner & Sakdapolrak, 2016; Mikulewicz, 2021; Radel, Schmook, Carte, & Mardero, 2018; Wrathall et al., 2014). These emphasise "the role of the political economy, and of natural resource access and rights, in explanations for migration, [… thereby adding] an analysis of structure to an otherwise unbalanced

focus on smallholder agency (or lack thereof, with climate instead as deterministic)" (Radel et al., 2018, p. 264). From this perspective, we can see that rural labour migration and remittances are not separate from, but in many cases deeply intertwined with local smallholder agricultural activities in translocal livelihood approaches (see also Taylor [2011] on how these relationships are relevant in transnational migration). Such mobilities have the potential to – but in practice often fail to – alleviate the marginalised position many of these rural households find themselves in (Natarajan, Brickell, & Parsons, 2019; Porst & Sakdapolrak, 2018; Radel et al., 2018). In a similar vein, Elmhirst, Middleton and Resurrección (2018) have developed a 'mobile political ecology' to study how floods and migration are interlinked beyond the 'displacement by floods' narrative in Southeast Asia. Their approach emphasises how vulnerability, resilience and capacities of individuals and households are "nested and teleconnected" (p. 11) in the context of migration, and impacted by a variety of different ecological and economic systems.

2.3. *Bringing together environmental mobilities and the political ecology of climate change*

Adding the insights from political ecology of climate change to the environmental mobilities approach – a *political ecology of environmental mobilities*, so to say – allows to position labour mobilities under climate change in a context *already shaped* in many respects by the mobilities of people and remittances, of environmental risk, knowledge and imaginaries of rural and urban lifestyles (Greiner & Sakdapolrak, 2016; Kelley, Shattuck, & Thomas, 2021; Natarajan & Parsons, 2021). Such an integrated approach puts at a centre stage the uneven multi-scalar power relations that shape both the susceptibility to the effects of climate change, and the options people have for responding (including mobilities). It thereby provides tools for analysing the underlying structural factors shaping the translation of climate change into locally perceivable effects and, as a consequence, environmental mobilities, which has been recognised as very important in this line of research (Boas et al., 2019; Cundill et al., 2021; Wiegel et al., 2019). Simultaneously, this combined approach also leaves room to attend to the subjective dimension of climate change and mobilities, to understanding individual perceptions of climate change and mobility options, which tend to not figure prominently in the more structural analyses of migration provided by political ecologists (see e.g. Elmhirst et al., 2018; Mikulewicz, 2021; Wrathall et al., 2014). In combining these two approaches for analysing "individual perspectives in relation to structures of power and wealth – from the global to the local" (Parsons, 2019, p. 676), the multi-layered effects of environmental changes on human im/mobilities come into focus.

Similarly to the 'progressive contextualisation' proposed by Elmhirst et al. (2018) in their mobile political ecology framework, methodologically and analytically such an approach requires attention to both the materiality of climate change effects and their relation to mobility patterns, their historical contextualisation and current governance, as well as a wider understanding of the origins of people's vulnerability to the event. Additionally, this should be combined with explicit attention to people's sense-making of climate change effects and their relationship to mobilities, as well as the role of existing mobility patterns to local livelihoods in terms of both their practice and attached meanings (cf. Cresswell, 2010). As reflected in the empirical sections of this paper, such multifaceted research approach can provide important insights into how both elements of the climate change-mobility nexus are inherently linked and contextually embedded.

3. Case description and methodology

3.1. *Case study description*

Stretching over 4300 km from north to south, Chile comprises a large variety of climatic zones. The *Norte Chico* (in English usually 'Near North') is a natural region extending from south of the Atacama desert to just north of the capital Santiago. This is a semi-arid region, forming a transition zone between the desert in the north and Mediterranean central Chile, characterised by fertile transversal valleys (Livenais & Aranda, 2003). The municipality of Monte Patria, located 300 km north of Santiago in the Region of Coquimbo (see Fig. 1), is characteristic for the *Norte Chico*. It had a total population of 30,751 in 2017, of whom around 6000 live in the namesake town and municipal centre, the others in the five main valleys of the municipality (see Fig. 2) (Municipalidad Monte Patria, 2018). The total surface of the municipality is 4,366.9 km^2, bordering in the east with Argentina. Statistically, ca. 30 % of the population are considered as poor, which is twice the national average (*ibid.*).

Monte Patria, just like much of the *Norte Chico*, is characterised by a predominantly agricultural economy. Although many households also gain an income outside of the municipality, particularly from the mining sector in the north of Chile, locally the most important economic sectors are large-scale[1] agricultural production for export (typically table grapes, increasingly also avocados and citrus), small- to medium-scale agriculture (fruits and vegetables for export and the Chilean market), as well as goat husbandry for cheese production (involving seasonal transhumance to the Andes mountains). In total, 82 % of the municipality's population depend on agriculture for their livelihood (Municipalidad Monte Patria, 2018). There are various small mines in the Andean mountains within the municipality; however, these were reported to be only exploited sporadically nowadays, depending on the changing world market prices for minerals.

Also historically, this region has been defined mainly by agricultural production and mining. First colonised by the Spanish settlers in the 18th century to exploit the mineral-rich ground, displacing the different indigenous people home to the area, later this region was transformed into one of agricultural production at the service of the more profitable mining sector in Chile's north. Until the 20th century, this was mostly

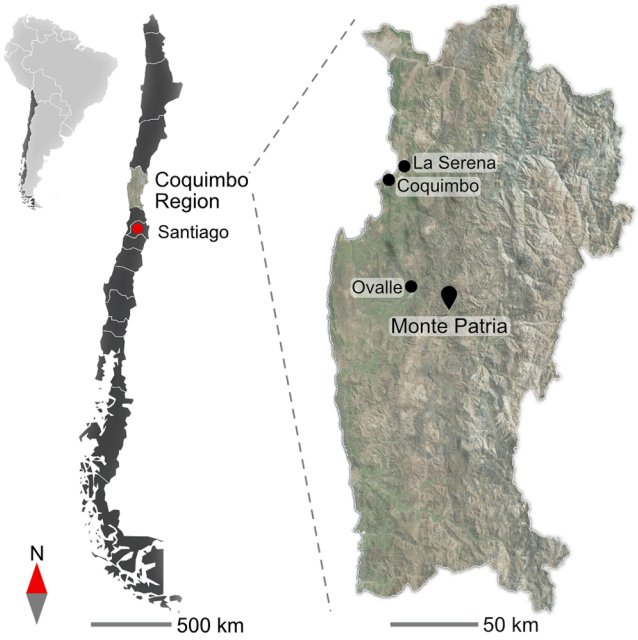

Fig. 1. Coquimbo Region, Chile. Depicted are the main regional urban centres and the research location. (Own elaboration based on Microsoft Maps.)

[1] In this paper, small-scale denotes agricultural landholdings of under 2ha, medium-scale 2-20ha, and large-scale above 20ha.

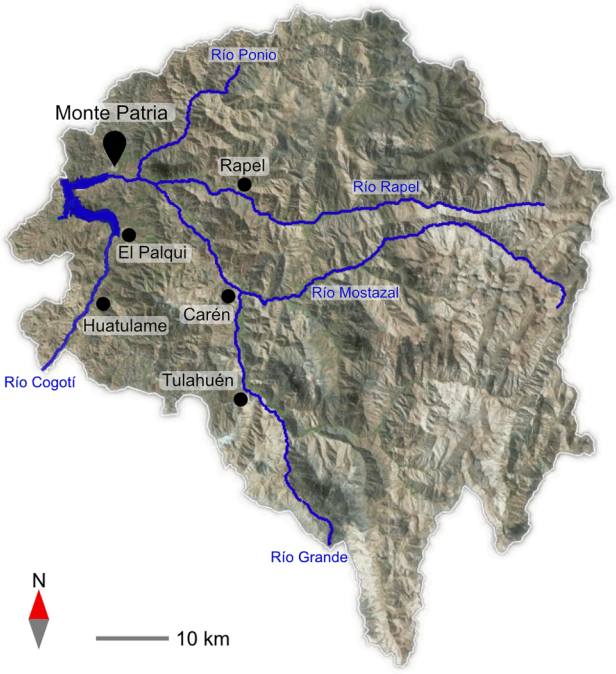

Fig. 2. The municipality of Monte Patria. Depicted are the main town Monte Patria, five larger villages as well as the five main rivers/valleys of the municipality. (Own elaboration based on Microsoft Maps.)

organised through the hacienda/latifundia system then common in the whole of Chile, characterised by exploitative labour practices (Heran, 2015; Livenais & Aranda, 2003; Pizarro Vega, 2013). To change this, 60 % of Chilean land was redistributed during the Chilean land reform between 1962 and the *coup d'état* of 1973, after which the re-reform by the military dictatorship expropriated roughly a third of the redistributed land from their new owners (Heran, 2015). Faced with difficult access to resources necessary for agricultural investments, many smaller landowners sold their land after the reforms, eventually leading to a higher concentration of land in the hands of a few than before the land reform was initiated. Together with the liberalisation and marketisation of land and water rights, this has contributed to the establishment of a neoliberal agricultural production system that defines the area until today (Budds, 2013; Heran, 2015; Livenais & Aranda, 2003).

In this semi-arid region, drought is one of today's defining challenges (Roco, Poblete, Meza, & Kerrigan, 2016). Meteorological droughts, defined in climatological studies as the negative deviation from average precipitation patterns for a significant length of time,[2] are common in this area and have been recorded as long as hundred years ago (Álvarez, 2018). However, in recent decades these have occurred with increased frequency, duration and intensity, which has been partially ascribed to climate change (Boisier, Rondanelli, Garreaud, & Muñoz, 2016; Lillo-Ortega, Aldunce, Adler, Vidal, & Rojas, 2019; Roco, Engler, Bravo-Ureta, & Jara-Rojas, 2015). Since the start of the current meteorological drought in 2007, the area has on average experienced precipitation deficits of around 30 % (in 2019 over 80 %) below the 30-year average (Oficina de Cambio Climático, 2021), and the current drought is referred to as a 'megadrought' in both Chilean media, government communications and academia.

3.2. Research methodology

This article draws on ethnographic fieldwork conducted in the municipality of Monte Patria between October and December 2019. This includes 39 semi-structured in-depth interviews with local government and municipality staff, water experts, farmers with land of different sizes, goat breeders and agricultural workers. This was complemented with numerous informal conversations varying from short encounters to evening-long exchanges, with a range of Monte Patrians of different age groups and professions (my position as a researcher was always made clear in these conversations). In recruiting interlocutors, particular emphasis was placed on gaining insights from different valleys and professions, in order to understand how drought and mobility figure differently per area and livelihood.[3] Furthermore, 11 follow-alongs (cf. Boas, Schapendonk, Blondin, & Pas, 2020; Büscher & Urry, 2009) with municipality staff, goat breeders, academics, irrigation administrators and environmentalists during their work in the municipality, each lasting half or full days, allowed to gain a deeper understanding into their work and to better grasp the differences of drought effects between and within the different valleys of the municipality. Additional data was collected through participant observations in various official events, public courses (mostly on water or biodiversity conservation) and citizen meetings held in the municipality during the research stay. Interviews were recorded by voice recording or note-taking. Informal conversations, insights from follow-alongs and events were recorded in fieldwork logs (as voice recordings) on a daily basis. All recordings were transcribed, and the data was subsequently coded inductively. The research was conducted in Spanish. As a foreigner and fluent if non-native Spanish speaker, I have aimed to corroborate factual information and findings on historical developments by triangulation.

In the first month of the fieldwork period (October 2019), an unexpected and unprecedented wave of social protests started in Santiago and quickly spread throughout the whole country, denouncing amongst others the high levels of inequality and privatisation in Chile (Navarrete & Tricot, 2021). While protests in Monte Patria town and its surrounding villages were mostly limited to smaller demonstrations, several respondents did express their discontent with the national *status quo* during the conversations and interviews in the weeks after the start of the protests, which is reflected in the empirical data. The fieldwork was conducted before the Covid-19 pandemic; its effects on the municipality and local economy are therefore not discussed in this article.

To understand local mobilities as embedded in the political ecology of the agrarian context increasingly affected by droughts, in the following sections I analyse how climate change is locally translated into perceivable effects (cf. Parsons & Chann, 2019), how and why different groups of the local population are vulnerable to these effects (cf. Ribot, 2011), and which options – including mobility – they have to adapt and respond.

[2] Climatological studies further distinguish these types of drought: Meteorological drought may cause a hydrological drought (decreasing water availability in rivers, reservoirs and aquifers), leading to agricultural drought (affecting crop production) and eventually socio-economic drought (when there are shortages of agricultural products and demand exceeds supply) – however, these latter three types of droughts are also strongly influenced by the management of the available water resources. Water scarcity, resulting from unsustainable use of the available water, creates a high vulnerability to meteorological drought, making the area susceptible to the other types of droughts (Schmidt & Benítez-Sanz, 2013; van Loon & van Lanen, 2013).

[3] The interviewees and interlocutors were distributed as follows (repeated or very brief conversations not counted here), by profession: Staff of municipality/administration/education (n=12), water administration (n=4), goat breeders (n=14), farmers (n=20), agricultural workers (n=9), other (n=5) and expert interviews (water scientists, anthropologists, journalists) (n=5). By location: Ovalle (n=5), Monte Patria town (n=14), Huatulame valley (n=7), Río Grande valley (n=16), Río Mostazal valley (n=3), Río Ponio valley (n=12) and Río Rapel valley (n=12).

4. Local sense-making of drought

In Monte Patria, and Chile's *Norte Chico* in general, the seriousness of rainfall deficits cannot be denied. They constitute the most pressing environmental problem, strongly affecting both the agricultural economy and the emotional wellbeing of the local population. Many interlocutors emphasised how it pained them to see the riverbeds they used to bathe in dry out, to see goats starve to death, or the bare fields of many small-scale farmers. Strikingly, however, few local respondents explained the worsening droughts as consequence of systemic and anthropogenic climate change, although this explanation is increasingly used by the local government. Instead, many turned to religion and explained the lack of rain and dry riverbeds as 'God's will' and beyond human influence. Some also referred to their experiences of previous severe droughts (such as 1968–72) when it had already – in hindsight, erroneously – been announced that "it would never rain again" (elderly villager, male, from Rapel valley, conversation 11/11/2019), to explain the current drought as a natural variation in climate that might be over in a few years.

The majority of interlocutors, however, emphasised that the drought and its effects were strongly linked to the agricultural economy and its water distribution system. This latter view was most succinctly expressed by a young woman hitchhiking with me one day from one of the villages in Río Grande valley to the town of Monte Patria. When our small talk turned to the topic of drought, she said straight away: "Oh, this is no drought. All the water is taken by the plantations. That's why there is no water" (conversation 11/07/2019). This sentiment was echoed in wall graffiti in a village along Huatulame valley, which concentrates the majority of the municipality's large-scale plantations: "*No es sequía, es saqueo*" – "This is no drought, it is [water] theft".[4] Similar notions were shared by many respondents of diverse backgrounds and locations in the municipality, who concluded that it was not only the lack of rain, but rather the unequal distribution and unsustainable use of the available water in a situation of structural water shortage, which was the most pressing problem in the area. In climatological terms, respondents thus argued that the underlying issue in Monte Patria was not just the precipitation deficit (i.e. meteorological drought), but a structural water scarcity (cf. Schmidt & Benítez-Sanz, 2013; van Loon & van Lanen, 2013).

5. Drought and the Chilean water distribution system

Unequal water distribution in Monte Patria, and in Chile in general, is a legal and economic issue. The Chilean Water Code, in its basis unchanged since its implementation in 1981 under the military dictatorship,[5] separates land from water (for more details, historical developments and comparative analysis of this system, see e.g. Álvarez, 2018; Budds, 2004, 2013; Urquiza, 2014; Warner et al., 2009). Under this system, the water flows in rivers and canals are divided into water rights that can be acquired individually (as indefinite lease), each right entitling its holder to using a defined amount per defined time period from the specific river or canal. In this system with exact calculations of water amounts conceded to each shareholder based on the 1981 water levels, much of today's available water is over-planned in relation to current irrigation needs, making the agricultural sector vulnerable to even small variations in water availability (cf. Álvarez, 2018; Urquiza, 2014). While there is a system in place to adapt the distribution to temporarily lower water levels, it is not designed to adapt to permanent changes in water availability (interview water scientist in Monte Patria town, 10/28/2019).

As water rights can be acquired independently of land rights according to Chile's free market logic, this has led to a concentration of water rights in the hands of the highest bidders, mostly large investors and plantation owners. These can compensate for the decreasing water availability by buying more shares of water, which allows them to continue agricultural production during meteorological drought, or even change to more water-intensive (but more profitable) products such as citrus and avocados, as can currently be observed in Monte Patria (Municipalidad Monte Patria, 2018). To ensure getting their lawful shares of water, which are necessary for maintaining agricultural production (and thus employment and tax revenue for the municipality), many plantations have also been permitted by water committees to drill deep wells to tap into subterranean water bodies, further depleting the available resources.

6. Drought effects on vulnerable rural livelihoods

The free-market logic of water distribution described above spatially and temporarily differentiates the effects of decreasing precipitation levels (meteorological drought) across different socio-economic groups. While some areas and groups of farmers within the municipality of Monte Patria might already experience decreased agricultural production, others (often larger upstream plantations) might still be able to engage in agricultural production at largely unchanged levels. The effects of climate change-related decreases in precipitation levels and frequency (Boisier et al., 2016) are thus not homogenous within the area, but are mediated by the specific geographic and socio-economic situation of water shareholders (*regantes*) within the municipality (cf. Marino & Ribot, 2012; Parsons & Chann, 2019).

For this reason, the various livelihoods among the 82 % of the local working population depending on agriculture are impacted by the drought at different times and through different mechanisms. The next sections provide insights specifically into how smallholders and agricultural workers are affected, taking into account how the drought interacts and enhances the already vulnerable position many households find themselves in.

6.1. Smallholders and their limited options for in situ adaptation

Small-scale agriculture in Monte Patria includes both horticulture (typically either fruit or vegetables for the Chilean market, as opposed to the export-oriented fruit production of the agroindustry), and pastoral goat farming for cheese production. Over the past decades, these professions have become characterised by high economic instability due to price volatility, dependency on (reportedly often exploitative) intermediaries for selling their produce, difficulties in accessing credit and growing costs of necessary agricultural investments (e.g. for pesticides). It is in this structurally disadvantaged position that they are increasingly confronted with the additional pressures of meteorological droughts.

The effects of decreasing precipitation levels are first experienced by goat breeders and subsistence farmers without water rights. The lack of rain results in decreased to no plant growth, leading to a growing economic burden of buying food for both human and animal consumption. Particularly the prices for animal fodder have increased significantly during the past years of drought, making it highly uneconomic for goat breeders to maintain their animals in the valley. During agricultural emergencies, goat breeders have access to financial and in-kind support by the government, but also this was reported by many as insufficient to maintain their animals. The consequences, as interviews and follow-alongs showed, are serious animal malnourishment and high animal mortality rates, rendering goat cheese production – the economic objective of goat herding – impossible for many breeders.

Water right-owning small- to medium-scale farmers that produce fruit or vegetables are affected by the changing precipitation levels when the rivers and canals start to carry less water, since they are effectively disadvantaged by the free market distribution of water rights.

[4] Much used as a wider slogan nowadays, and even a hashtag #noessequiaessaqueo.

[5] Though at the moment of writing, there were intentions to develop a new Water Code.

As rainfall decreases, canal or river water for irrigation becomes even more important to maintain production, yet many of these farmers lack the means for *in situ* adaption that could include acquiring more of the increasingly expensive water shares,[6] constructing water tanks, drilling wells, changing produce or installing more water-efficient irrigation methods, despite subsidies by state-funded drought adaptation programs. In this context, even those farmers with formerly sufficiently water rights now often do not receive enough water to maintain their fruit or vegetable plantations, which is an important factor increasing the economic instability of small-scale farming.

6.2. Agricultural workers under increasing competition

In Monte Patria, the agricultural industry (including both plantations and packing stations) is the most important employer. Therefore, the decreasing precipitation levels also affect agricultural workers – although differently and often later than smallholders. Large-scale plantations typically have a higher resilience than small- to medium-scale farmers against fluctuations in water availability due to their easier access to the economic resources necessary for *in situ* adaptation such as acquiring more water rights and investing in more efficient irrigation systems, larger water tanks or deeper wells. However, after more than 10 consecutive years of precipitation deficits in Monte Patria, also large-scale plantations have had to adapt beyond technical improvements, for example by reducing the planted surface or by progressively changing from table grapes to more water-intensive, yet more profitable produce such as avocado and citrus.

These changes affect agricultural workers both in the plantations and packing stations. By the nature of the sector, the available work is mostly reduced to seasonal manual labour. However, new products such as citrus or avocado need even less manual labour, particularly in the years of conversion. Likewise, smaller plantations require less workers. With the decreasing water availability, the harvest seasons become shorter and more concentrated, and some agricultural companies were reported to compensate the increased irrigation costs with a decrease in hired manual work during the harvest season. All these developments contribute to increased competition for fewer available jobs.

These dynamics enhance the already vulnerable position of the workers in the Monte Patrian agroindustry with its dependence on occasionally volatile international sales markets[7] and the international competition with other South American producers such as Peru, which pushes Chilean producers to keep production prices (including workers' wages) at a minimum. Furthermore, the now dominant intermediary contractor system aggravates the competition: While traditionally workers would be directly employed by the plantation owner for the season or even several years, nowadays the search for workers, their renumeration and their daily transport to the plantations has mostly been outsourced to brokers acting as intermediaries. These tend to pay workers by performance rather than working hours, and while it is possible for the most fit and experienced workers to gain a good income, this work is physically taxing, and many workers do not earn more than the national minimum wage. In the intermediary system, workers tend to have only weekly contracts and limited labour rights, which has generally increased work insecurity (cf. Heran, 2015). Many respondents commented that work in the agricultural sector is generally considered 'bad work', but that workers in this sector often do not dare to speak up against the lack of workers' rights, due to fear of losing their jobs and becoming permanently unemployable.

Overall, then, both smallholders and agricultural workers find themselves in a position of growing vulnerability to the decreasing precipitation, though through different mechanisms and at different phases of drought (smallholders during meteorological or hydrological drought, depending on whether they have water rights; agricultural workers during agricultural drought, cf. Schmidt & Benítez-Sanz, 2013; Van Loon & Van Lanen, 2013). Long-established structural difficulties in both professions, such as the overreliance on intermediaries in neoliberal markets, the lack of workers' rights or political bargaining power, and restricted access to necessary economic resources (including credit) significantly limit the perceived options for *in situ* adaptation to the additional pressure of prolonged droughts, which further aggravates their situation. In this context, mobile or *ex situ* responses become increasingly important.

7. Non-agricultural income strategies in the already mobile rural context

Contrary to what the 'climate migration' narrative suggests, the meteorological droughts play out in what is an *already mobile* agrarian context. The structural problems of typical rural livelihoods in Monte Patria described above have over time led to a high reliance on multi-professional, translocal and transgenerational household income strategies for meeting increasingly expensive everyday needs. This means that different professions are often closely connected within the family circle, and many rural households already depend on two or more professions for their income. For example, several respondents engaged in small-scale agricultural production, while their adult children work shifts in the mining sector, as agricultural labourers on the plantations or in other professions outside of Monte Patria, contributing with their income to the regular living costs or necessary agricultural investments of their parents. Far from being novel or exceptional, in Monte Patria today mobilities are thus central to social and economic relations; they have come to characterise both household income strategies as well as family life (cf. Urquiza, 2014).

As the progressing drought and unequal water distribution aggravate the structural economic insecurities of many smallholders and agricultural workers, and the options for local adaptation within these professions are limited, income strategies directed outside of the agricultural sector are considered as increasingly important by the local population. This is reflected in the census data of past years (Municipalidad Monte Patria, 2018), and in comments made by several elderly goat breeders and small-scale farmers from different parts of the municipality: When asked if the next generations would take over their land or animals, they laughed at the idea, stating firmly that neither they themselves nor their children would want that. They perceived their work, though of local historical and cultural importance, as nowadays too unrewarding, physically taxing and economically unstable to provide for their children and their families, and wished for them to have "easier lives" (conversation with elderly goat breeder in remote sector of Río Ponio valley, 11/14/2019). This concurs with the locally widespread views on traditional livelihoods as 'unmodern' and 'without a future'. The commonly held opinion was that to overcome household poverty in this rural context and to 'improve one's life', the best way was to find stable work outside the agricultural sector.

However, such employment opportunities are scarce in Monte Patria, and even more so in the rural parts of the municipality. With only 18 % of the local population gaining an income outside of the agricultural sector, most importantly in commerce and services, the municipal administration and the education sector (Municipalidad Monte Patria,

[6] As of November 2019, these cost up to 50 million Chilean pesos per water right in some canals of the municipality, according to staff from a local water committee in Huatulame valley (interview 11/29/2019).

[7] In recent years, changes in buyer preferences in North American or European markets had devastating impacts on the local economy and employment opportunities. For example, when the US market stopped importing the grape variety 'Flame' in 2016, which at that time was the most common variety in Monte Patria, the economic consequences on the local economy were severe, leading to the bankruptcy of many small-, medium- and large-scale producers and the (temporary) loss of 2000 jobs in plantations and packing stations. Locally, this event is widely considered as having had a stronger economic impact than the extremely dry season of 2013/2014.

2018), there are not sufficient non-agricultural work opportunities locally available. For many, particularly the younger generations, this means searching for work outside of the municipality. Although several middle-aged and elderly respondents reported that many of the younger generation actually had a preference for urban lifestyles which they associated with 'modernity' and 'progress', many younger interlocutors argued that even if they wanted to, they did not see many options for themselves to build lives and support their families in the rural context given the limited economic opportunities. This renders an analytical distinction between 'voluntary' and 'involuntary' mobilities large impossible (cf. Carling & Schewel, 2018; de Haas, 2014; Radel et al., 2018; Wiegel et al., 2019; Wrathall et al., 2014). As one young woman working as an administrator in a rural water committee in Huatulame valley drily commented when we talked about that most of her peers had left the village: "I'm here only because I have a job" (conversation 11/26/2019) – without this stable income from administrative work, she is certain she would have had to search for work elsewhere, too, despite her personal preference to remain in Monte Patria.

8. Labour mobility patterns directed outside of the municipality

As this dynamic of gaining an income outside of the municipality for the lack of local non-agricultural employment opportunities has become well-established during the past decades, and is now further accelerated by the intensifying droughts affecting the agricultural sector, there are well-known pathways of (circular) labour mobility directed outside the municipality. This implies that these labour mobilities have become established mobility practices (cf. Cresswell, 2010): they are normalised and widely accepted, and people can fall back on the experiences and contacts of others to engage in these mobilities. These are important factors making them a relatively easily-accessible option even for people with limited means. For example, work in the construction sector has long been an option for men to temporarily earn an additional income, without needing to give up their rural livelihood. The more permanent outmigration of young adults, both male and female, is also common for obtaining higher education after graduating from the local high schools (where this can be afforded in the costly Chilean education system) and professional opportunities, as well as to find work in urban service sectors (such as gastronomy, cleaning or guard services etc.). Typical destinations are the provincial capital, Ovalle, the regional urban centres of La Serena and Coquimbo, as well as Santiago de Chile (see Fig. 1).

Another well-established labour mobility pattern, which has a long tradition in the region dating back to the 19th Century, is to gain an income in the mining sector in Chile's northern regions (Heran, 2015; Municipalidad Monte Patria, 2018). Employment in this sector provides a stable, year-round income much above the average wages of agricultural work, and has according to the research participants in recent years become an important source of household income in Monte Patria. While historically men from the Coquimbo region permanently moved to the North to work in the mining sector, sometimes with their families, today's shift work and transportation systems[8] allows them to maintain their main residence in other regions while working in Chile's most important economic sector. Though mining is traditionally a male-dominated sector, one respondent related that after the extremely dry summer season of 2013/2014, more young women started to engage in this labour mobility pattern, working mostly in mining-related service sectors (food services, administration, etc.).

Overall, a generational shift can be observed in professional choices and, relatedly, in the levels of engagement in (labour) mobility patterns. While it is mostly the elderly that continue to engage in traditional sectors, such as cattle breeding and small-scale agriculture, younger generations increasingly earn their income outside of the municipality, such as in the mining sector or by moving to urban areas. This shift is accompanied by a dynamic of 'periphery-to-centre' mobility within the municipality, in which residents of the more remote valleys move to the urban areas or bigger villages in the central valleys with access to labour in the agroindustry, to complement the income from traditional goat breeding or small-scale agriculture. Simultaneously, it is mostly the residents of these central valleys that engage in rural–urban migration or circular labour mobility to the northern mining sector. This dynamic is reflected in the permanent closing of 15 rural schools in the more remote sectors of the area over the past ten years, as well as the overall aging of the population and the relative decrease of rural population within the municipality in the period between the national censuses of 2002 and 2017 (Municipalidad Monte Patria, 2018, 2020).

Also the stories of 'return migrants' in Monte Patria support the widely-held perception that in order to build a 'better life' locally, capital earned outside the agricultural sector and (almost by implication) outside the municipality is a necessary prerequisite. This group of five interlocutors grew up in the area, or had at least close family ties which meant they used to visit frequently, but worked outside of the municipality for different lengths of time before returning to live there, emphasising their strong place-attachment in our conversations. Some had earned their income as professionals in bigger cities, others by working several years in the mining sector in Chile's north. Each returned to the area with the necessary capital (and in several cases the stable income of a professional's pension) to make local investments in the tourism sector or to build more efficient, drought-resilient agricultural businesses, which they considered would have been impossible had they never left the rural context in the first place.

In this context, where labour mobilities across professions and often directed outside of the municipality, are long considered as a necessary and potentially positive means of managing the structural vulnerabilities attached to agriculture-dependent livelihoods in Monte Patria, the 'climate migration' narrative has found only little resonance locally. For the local population, engaging in these labour mobilities is not an exceptional and direct response to the severe precipitation deficits of recent years, but rather a normal fact of everyday social life in this rural semi-arid area, rooted in the combined effects of the precarious system of agricultural labour, the water distribution disadvantaging small-scale producers vis-à-vis the agricultural industry, and the widely shared view that traditional agricultural livelihoods have no future. As precipitation deficits increase, more people (temporarily) fall back on pre-established pathways of labour mobilities directed outside of the municipality, but this is not considered as an adaptation to climate change, but rather to the limited options they see locally for living a dignified life.

9. Complicating the tale of 'first climate migrants' through a political ecology of environmental mobilities

The case of Monte Patria has illustrated how the study of environmental mobilities can profit from a more critical engagement with political ecology, particularly in the context of rural, agriculture-dependent areas. Research of recent years on the environmental mobilities approach has already emphasised the contextual embeddedness of im/mobilities under climate change, as well as the differential distribution of mobility potentials rooted in uneven "social, political, economic, and cultural relations spanning different scales" (Wiegel et al., 2019, p. 6; see also Blondin, 2020; Boas et al., 2019; Suliman et al., 2019; Zickgraf, 2019) based on Cresswell's 'politics of mobilities' (2010). While environmental migration scholars have increasingly called for more critical focus on how these impact people's im/mobilities in everyday life (Blondin, 2021a; Kothari & Arnall, 2019; Parsons, 2019), the environmental mobilities approach itself provides only limited tools for analysing the effects of climate change. Political ecology literature, on the other hand, has extensively engaged with climate change (adaptation) (see e.g. Eriksen et al., 2015; Marino & Ribot, 2012;

[8] Shifts typically last 7, 10, 14 or even 21 days with at least one free week in between during which workers return home using the tight network of long-distance overnight bus connections or frequent flight connections.

Taylor, 2014) and also, to a lesser extent, with (labour) migration under climate change (see Elmhirst et al., 2018; Natarajan et al., 2019; Natarajan & Parsons, 2021; Parsons & Natarajan, 2021; Porst & Sakdapolrak, 2018).

Integrating both approaches into a *political ecology of environmental mobilities*, as set out in this paper, can potentially provide for a more power-sensitive understanding of environmental mobilities. Through this lens, not only mobility potentials themselves, but also the translation of climate change into locally perceivable effects (cf. Parsons & Chann, 2019; Parsons & Nielsen, 2021) and the options for adaptation to these effects (cf. Eriksen et al., 2015; Ribot, 2011) become visible as mediated through pre-existing uneven socio-political and economic relations. Despite their distinct theoretical origins, a combination of both approaches can provide a framework for bringing the contextual analysis of multi-scale human-environment interactions into environmental mobilities research (cf. Greiner & Sakdapolrak, 2016; Parsons, 2019). This is based on a fluid and agentic understanding of mobilities in a politicised environment, starting with the premise that mobilities are already central to today's social, political and economic relations, also in rural contexts (cf. Boas et al., 2019; Kelley et al., 2022; Radel et al., 2018).

Through this combined analytical lens, unequal access to water and capital as well as the limited options to earning a good income in Monte Patria can be regarded as more important reasons for circular or longer-term mobilities directed outside of the municipality than considerations of climate change (adaptation). In line with the findings of Radel and colleagues from north-western Nicaragua, the case of Monte Patria shows that rural labour mobility typically "neither facilitates adaptation to climate change nor reflects a failure to adapt, but rather *reflects the weak position of smallholders in interlocking relations of power* and the relative land [or in this case, water] scarcity experienced by many" (2018, p. 263, emphasis added; see also Wrathall et al., 2014). Climate change and related meteorological droughts, rather than constituting a novel or disconnected threat, act thus as a 'risk modifier', increasing existing inequalities.

This study has shown that in such cases, it can be *staying* rather than *moving* that is considered increasingly difficult. Perceived structural obstacles to locally living a 'good life', especially in terms of economic security, inevitably impact people's aspirations about moving or staying, which makes it very difficult to distinguish between 'voluntary' and 'involuntary' mobilities (cf. Carling & Schewel, 2018; de Haas, 2014; Radel et al., 2018; Wiegel et al., 2019; Wrathall et al., 2014). The widely perceived necessity for engaging in migration and circular labour mobilities, largely independent from personal preferences for rural or urban lifestyles, turns on its head the sedentarist logic of mainstream migration studies that typically considers moving away as the exception from geographically stable lives (Dahinden, 2016; Schapendonk, Bolay, & Dahinden, 2021). Mobilities then tend to take place along established pathways that have been formed over time by the multi-fragment livelihood strategies are already common in many rural contexts, allowing for easy access through long-established networks (Kelley et al., 2022; Porst & Sakdapolrak, 2018; Rockenbauch, Sakdapolrak, & Sterly, 2019). This underlines the interlinkage of practices and representations of mobilities (cf. Cresswell, 2010): even if many consider staying in Monte Patria as increasingly difficult, moving along the 'well-trodden path' towards e.g. work in the Northern mining sector generally has positive connotations among the local population. This stands in stark contrast to the 'climate migration' narrative reproduced in national media, with its associations of novelty, desolation and choicelessness. The latter narrative is therefore, unsurprisingly, not considered by the population as representing local realities.

Applying the framework of a 'political ecology of environmental mobilities' may help to counter the continued prevalence of such 'climate migration' narratives that tend to exceptionalise mobilities and reduce them to the motive of climate change (see e.g. Arnall, 2014; Bettini, 2013; Bettini & Gioli, 2016; Wiegel et al., 2019). While often employed to create an urgency that can serve for drawing attention in the media, these storylines can have severe consequences for policy making. Specifically, this is the case if proposed policies fail to address the underlying reasons for the target population's vulnerability to climate change as well as their limited options for response (Eriksen et al., 2015; Marino & Ribot, 2012; Taylor, 2014). Such mal-adaptative policy-making is illustrated in the case of the Santa River watershed, Peru (Wrathall et al., 2014): This agricultural area, like Monte Patria characterised by highly uneven resource access, is affected by a decrease in available water resources. Wrathall and colleagues show how the government's adaptation policies resulted in more laws and restrictions regarding water usage, thereby further limiting rather than improving smallholders' options for *in situ* adaptation. Consequently, labour migration increased as the local population considered it to be one of the few remaining options for securing their livelihoods. This example underlines how climate change adaptation policies, if neglecting to address uneven resource distribution, power relations and existing mobilities, can in the long run lead to rural depopulation and increase the concentration of land and water in the hands of the resource-rich agro-industry – thereby reinforcing instead of redistributing uneven resource control (cf. Mikulewicz, 2021).

10. Conclusion

This article has explored why the 'climate migration' narrative, ascribed by the national media to the population of Monte Patria in semi-arid Chile, has found little resonance locally. Through the combined lens of the environmental mobilities approach and the political ecology of climate change, this article has shown that uneven resource access, limited political bargaining power and the perceived impossibility to locally earn a sufficient income are more important factors shaping mobilities than climate change itself. It is this set of factors that conditions both how precipitation deficits are translated into locally perceivable effects through the water distribution system, how these effects impact different socio-economic groups differentially, and what options – including mobilities along pre-established mobility patterns – locals perceive to have for responding. In Monte Patria, the prolonged meteorological droughts of the past years have created strong pressures on the uneven water distribution system and the existing structural economic insecurity of smallholders and agricultural workers. This increased the need for transgenerational, non-agricultural income strategies and has led to growing participation in existing dynamics of labour mobilities directed outside of the municipality, most importantly to the mining sector in Chile's North. Research applying a political ecology of environmental mobilities perspective can thus provide a power-sensitive perspective on the climate change-mobilities nexus, incorporating both local perceptions and power relations extending beyond the case-study level.

A starting point for future research applying the political ecology of environmental mobilities is to link local sense-making of environmental changes and mobility patterns to structural factors extending far beyond the case study level, such as the incorporation into national resource management strategies, international export logics or historically-shaped representations of agricultural livelihoods. Such an approach can help to overcome the 'epistemological disjuncture' between the objective and subjective dimensions of climate change and their relation to im/mobilities, as pointed out by Parsons (2019) and Parsons & Chann (2019). Future research could better attune to how these dimensions are intimately interlinked in the experiences of everyday life under climate change, in the struggles to sustain resource-dependent livelihoods that, for a multitude of reasons, are often already marginalised. This could be combined with more historical analysis of the origins of such marginalisation, as well as of established mobility patterns. These insights can serve to guide climate change adaptation policy-making that is attuned to existing mobility patterns and the importance of resource redistribution, a starting point for avoiding maladaptive interventions.

CRediT authorship contribution statement

Hanne Wiegel: Conceptualization, Investigation, Methodology, Writing – original draft, Writing – review & editing.

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.

Data availability

The data that has been used is confidential.

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