Pluralising the climate change-migration nexus

Explorations of environmental im/mobilities, perceptions and politics

Hanne Wiegel

Propositions

1. To balance nuance and urgency in addressing 'environmental im/mobilities' is difficult, but very necessary.
   (this thesis)

2. Research and governance of 'environmental im/mobilities' require moving beyond a focus on movements and climate change.
   (this thesis)

3. Most discussions in sociology eventually turn into a debate on structure/agency.

4. Migration experience highlights inadequacies and absurdities in migration research.

5. A social sciences perspective is essential to prevent climate reductionism in climate change governance.

6. Limited working hours boost prioritisation skills and intentionality, but not creativity.

Propositions belonging to the thesis, entitled

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Table of Contents

List of figures

List of tables

List of abbreviations

EU	European Union
IOM	International Organisation of Migration
IPCC	Intergovernmental Panel on Climate Change
NGO	Non-governmental organisation
OHCHR	Office of the United Nations High Commissioner for Human Rights
ONEMI	*Oficina Nacional de Emergencia del Ministerio del Interior* | National Office of Emergency of the Interior Ministry (Chile)
REDD+	United Nations Framework for 'Reducing emissions from deforestation and forest degradation in developing countries'
SERNAGEOMIN	*Servicio Nacional de Geología y Minería de Chile* | National Geology and Mining Service (Chile)
UK	United Kingdom
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USA	United States of America

Chapter 1

Introduction

1. Introduction

The figure of the 'climate migrant' has become emblematic of the severe societal consequences of climate change. In many media, policy and academic arenas, it is assumed that increasing sea-level rise, droughts or heat waves will cause a significant number of people to leave their homes (Nature Climate Change Editorial, 2019). Managing these projected population movements, both within and across national borders, and finding new homes for people whose habitual places of residence possibly become uninhabitable – so the story goes – will be one of the major challenges of the future.

What is conspicuous about these rather dramatic narratives, however, is that the voices of those most affected by climate change today tend to be silent, if not altogether missing. We rarely hear about their views on the changes they observe in their daily lives, what they would consider suitable adaptation responses, and what role considerations about migration and relocation play in this context. This silence is problematic, as recent empirical studies from around the globe show that local perspectives on the problems posed by climate change, and possible ways to address them, tend to differ significantly from such 'climate migration' narratives (see e.g. Arnall & Kothari, 2015; Farbotko, 2018; Parsons & Chann, 2019).

Let me illustrate this with two images from the Chilean context:

Figure 1. Chilean news article

English (translation): "The country's first climate migrants. 15% of the population of Monte Patria have left the town due to climatic reasons, the first migrants of that type registered in Chile [...]" (Olivares, 2018)

Figure 2. Wall graffiti in the municipality of Monte Patria, Chile

English (translation): "It's not drought, it's [water] theft" Author's photo.

These two images each show a very different interpretation of climate change and its societal consequences. The first is a Chilean 2018 news excerpt heralding 'the country's first climate migrants' having to leave their hometown Monte Patria due to climate change (Olivares, 2018). The second photo, taken in 2019 in that same municipality, claims that the local lack of water is not caused by drought, but by water theft – a slogan widely used for protesting the high water consumption of the agricultural industry in that area (Rojas Vilches, 2021).

Taken together, these images underline the tensions between widely publicised interpretations of climate change and its potential consequences, including migration, and how those affected perceive what the problem is, who should be held accountable, and who should be responsible for finding solutions. While the news excerpt in the first figure makes a linear assumption about cause (climate change) and effect (outmigration), the second image points to problems resulting from unevenly distributed resources, without reference to climate change, and also to the relative lack of power of the author of this graffiti, who resorted to writing their political message on a village wall.

This thesis is about such tensions, and particularly about how they are at play when the dynamics of climate change and migration intersect. As the conflicting interpretations in the pictures above suggest, people's relationship with, and motivation for migration in the context of a changing climate is much more complex than is assumed in much of the debates on the topic (see Boas et al., 2019; Cundill et al., 2021). Here and in the following chapters, I will seek to open up simplistic explanations of how climate change and migration interconnect, to broaden our understanding of how these are nested in existing relations of power and, most importantly, to bring local interpretations of the relationship between climate change and migration into the conversation.

1.1. Evolving debates around the relationship between climate change and migration

Academic and policy debates about the relation between climate change and human migration are usually dated back to 1985. Although the environment figured as a potential push and/or pull factor in the earliest migration theories by e.g. Ratzel, Ravenstein or Huntington (see Piguet, 2013), it essentially disappeared from migration studies around the mid-20th century – until the concept of 'environmental refugees' was coined in a report by El-Hinnawi (1985) for the United Nations Environment Programme (UNEP). This and two other high-level policy reports published between 1985 and 1990 are typically credited with (re-)initiating the debates about the links between global warming, climate change, displacement and migration (Piguet, 2013). In academia, this was picked up quickly particularly by environmental scientists. Academic discussions around 'environmental refugees' and later 'climate refugees' sought to highlight the gravity of climate change by referring to its severe implications for vulnerable populations (for a critical overview, see e.g. Bettini, 2013; Gemenne, 2011b; Klepp, 2017). This first wave of 'climate refugee' research was mostly concerned with modelling future displacements and numerical projections, the most famous and persistent of which is Myers' forecast of 200 million climate refugees by 2050 (Myers, 2002; Myers & Kent, 1995).

These 'maximalist' projections (see Suhrke, 1994) were soon criticised for relying on simplistic methods and for considering those affected by climate change as passive victims only. The critics, often coming from a social sciences background and termed 'minimalists' by Suhrke (1994), instead emphasised the complexity and multi-causal nature of migration. Furthermore, they criticised the 'alarmist' nature of these projections and highlighted their problematic political impacts, criticising narratives about 'hordes of climate refugees' as a reflection of xenophobic politics rather than based on empirical insights (e.g. Black, 2001; Kibreab, 1997; Suhrke, 1994). These criticisms are best summarised in the influential Foresight Report (2011) which, based on detailed empirical insights, "proposes a multi-causal model of migration in which environmental drivers are just one factor out of several that, in different constellations, can affect migration decisions" (Boas & Wiegel, 2021b, p. 267). This multicausality is nowadays widely accepted, although alarmist narratives continue to be repeated in media, policy and even certain academic arenas (Boas et al., 2019; Durand-Delacre, 2022a, 2022b).

Apart from promoting the multicausal model of migration, the Foresight report, along several other publications from around that time, argued that migration in the context of a changing climate "should not be seen as a tragedy in itself but that, on the contrary, it can form part of a proactive adaptation strategy that should be encouraged" (Piguet, 2013, p. 155). Migration, in this alternative perspective, is considered to be a potentially positive adaptation strategy to environmental and climate change, as it becomes a means for finding employment elsewhere, sending home remittances, or gaining skills and knowledge that may better enable adaptation in places of origin (see e.g. Black, Bennett, Thomas & Beddington, 2011; Foresight, 2011; Gemenne & Blocher, 2017; McLeman & Smit, 2006; Warner & Afifi, 2014). The International Organisation of Migration (IOM) was an early supporter of this approach (IOM, 2014), and it also formed the core of the frequently studied 'Migration with Dignity' program that was promoted on low-lying Pacific Island state Kiribati under the government of former president Anote Tong (Farbotko et al., 2018; McNamara, 2015).

While thus gaining international traction, reflected in the inclusion of this approach in the 2022 Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC, 2022), also this more 'optimistic' perspective on migration as climate change adaptation has been criticised on several

points. For example, it is considered as downplaying the potential negative consequences of migration, such as dislocation of families and communities, as well as loss of social and cultural ties (see Durand-Delacre, 2022a; Farbotko et al., 2022). Furthermore, the image of labour migrants as agents of climate change adaptation often does not match empirical insights, which show that simplistic assumptions about remittances decreasing local vulnerabilities tend to neglect complex local realities, including power inequalities within communities (Bettini, 2017; Sakdapolrak, Borderon & Sterly, 2023). Moreover, this framing locates the responsibility to adapt on the household or community level rather than with government institutions, which silences the issue of climate justice between greenhouse gas emitters and those most vulnerable to climatic changes, who bear the greatest burden for their adaptation (Bettini, Nash & Gioli, 2017; Bettini & Gioli, 2016; Methmann & Oels, 2015).

Taken together, then, both the 'climate refugee' and the 'migration-as-adaptation' discourse fall short (albeit to varying degrees) of providing adequate analytical frameworks for developing a grounded understanding the impacts of climate change on migration. Though very different in their assessment of potential consequences, both discourses essentially understand migration as a linear and exceptional event related directly or indirectly to climate change. Such a position tends to consider 'climate migration' as an isolated event, rather than focusing on how it relates to local livelihoods and existing patterns of migration and mobilities (Boas et al., 2019; Kelley, Shattuck & Thomas, 2021). Furthermore, both approaches follow a "managerial logic" (Swyngedouw, 2010, p. 225, in Baldwin, 2014, p. 521), with a focus either on projected docile adaptive migrants following well-regulated labour migration pathways, or on climate refugees in need of order and control in order to avert a security crisis (Baldwin & Bettini, 2017; Bettini, 2017). Each of these discourses comes with foregone conclusions about policy imperatives for how to best manage the projected migratory movements. Advertently or inadvertently, this can silence debates and concerns about other interrelated, long-established dynamics such as rural poverty and outmigration, unequal access to water and safe building ground - adding insult to injury for those already marginalised (Arnall, 2014; Kelley et al., 2021; Klepp & Chavez-Rodriguez, 2018; Nicholson, 2014; Zetter & Morrissey, 2014).

1.2. Towards a pluralised approach

As a remedy to this tendency of exceptionalising and simplifying 'climate migration', Andrew Baldwin has called for 'Pluralising Climate Change and Migration' (2014). Since the relationship between climate change and migration is so extensive, affecting and affected by so many aspects of life, he claims that a more embedded approach to studying it is necessary: "If it affects virtually all aspects of life, then what routes into this relation [between climate change and migration] are available to us if our aim is to comprehend and respond to its complexities?" (Baldwin, 2014, p. 516).

Inspired by Baldwin's 2014 article, this thesis aims to contribute to pluralising[1] our understanding of this phenomenon by proposing new entry ways into what I will refer from hereon as the *climate change-migration nexus* to indicate a relationship of an open-ended nature. In doing so, this thesis builds on and contributes to recent critical scholarship on the topic. Three developments in this context have particularly shaped this study (which will be explained in more detail in Chapters 2 and 3): Firstly,

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[1] *Pluralising* is here used as a synonym for *broadening*, *expanding* and *diversifying*, without engaging in philosophical debates around the pluriverse and multiple ontologies (see e.g. Escobar, 2011).

the increasing recognition of the diversity and fragmentation of movements, which shows that migration is not always a straightforward movement from A to B, but that it might take the form of incremental movements, or cyclical and seasonal movements. These tend to be grounded within the local realities that often already engage directly or indirectly with migration (Kelley et al., 2021; Klepp, 2017; Porst & Sakdapolrak, 2018). Also non-migration, i.e. staying in place despite adverse environmental changes, has been increasingly a focus of research in this field (Adams, 2016; Ayeb-Karlsson et al., 2019; Blondin, 2021a, 2021b; Farbotko & Lazrus, 2012; Farbotko & McMichael, 2019; Mallick & Schanze, 2020).

Secondly, the growing body of research providing empirically grounded accounts of individual experiences and sense-making of everyday life under climate change. It centres on its cultural, emotional as well as political dimensions. Research in this field focuses on how people understand and cope with climate change within the realm of the everyday (Kothari & Arnall, 2019), and how they make decisions about moving and non-moving. Research in this line shows that contrary to the assumptions underlying the 'climate refugee' and 'migration-as-adaptation' narratives, scientifically measured climate change cannot be simply equated to the need to migrate – rather, perceived migration pressure is also shaped by local understandings, cultural norms and past experiences with environmental changes (Mortreux & Barnett, 2009; Parsons, 2019; Parsons & Chann, 2019).

And thirdly, the increasing re-politicisation of the climate change-migration nexus has been an important inspiration for this thesis. Such research places migration in the context of a changing climate within the power relations that shape people's vulnerability and response options. Academic work in this line, such as by Klepp and Herbeck (2016), Bettini (2017) and Zetter and Morrissey (2014), is critical of research that overstates the impact of environmental factors. Studies show that how people respond to climate change, for example through migration, often reflects their position in established power relations, the distribution of natural resources, social and economic capital as well as personal and community experiences (Kelley et al., 2021; Nicholson, 2014; Radel, Schmook, Carte & Mardero, 2018; Zetter & Morrissey, 2014). Empirical examples support this position, providing evidence of stark inequalities in migration potentials along economic, gender, race and social class lines even in relatively affluent regions of the globe (see e.g. the example of Hurricane Katrina mentioned in Chapter 2). At the same time, several studies show how the argument of climate change (adaptation) is sometimes used discursively to legitimise controversial spatial policies, such as population resettlements, framing them as technical solutions to a biophysical problem (Marino & Ribot, 2012; van Voorst & Hellman, 2015).

To bring together insights from these three developments in the field of climate change-migration research, I take the mobilities approach as a theoretical starting point and underlying inspiration for studying the climate change-migration nexus. Sometimes referred to as the 'new mobilities paradigm', the mobilities approach is a theoretical perspective developed by John Urry and Mimi Sheller (Hannam, Sheller & Urry, 2006; Sheller & Urry, 2006; Urry, 2007). It is based on the credo that in our highly mobile world, social relations from the local to the global are produced and reproduced by the mobilities of people, objects, information, risks and ideas. Mobilities are thus considered a socio-political reality, and from this perspective should be treated as normal rather than the exception. This will be explained in greater detail in the chapters of this thesis.

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Approaching the climate change-migration nexus from a mobilities perspective provides several novel entry points compared to the earlier approaches: It moves the focus away from exceptional movements to the centrality of mobilities in everyday life and social relation, be they long or short in geographical and temporal scales, and how they relate to immobilities within the household, community or population at large. This change of perspective allows for a more situated understanding of how climate change is impacting mobilities and mobility decision-making in people's everyday life (Sheller & Urry, 2006). Furthermore, as the study of mobilities "focuses not simply on movement per se, but on the power of discourses, practices, and infrastructures of mobility in creating the effects of both movement and stasis, demobilisation and remobilisation, voluntary and involuntary movement" (Sheller, 2018b, p. 11; see also Cresswell, 2010), this perspective allows to study how mobilities under a changing climate are imbued with meaning through discourses, politics and their place in wider power relations.

By applying Urry's and Sheller's mobilities approach to the climate change-migration nexus, with this thesis I contribute to the conceptualisation and development of the 'environmental mobilities' perspective (see Boas et al., 2018, 2019; Cundill et al., 2021). This approach brings together the three research directions described above: the broadened focus on a diverse range of movements – including non-movement – under climate change; the micro-level focus on lived experiences and local sense-making; as well as attention to the political dimension of mobilities under climate change, as they are embedded in existing relations of power.

Critical engagement with the 'climate change-migration nexus' requires an interrogation not only of 'migration', but also of 'climate change'. It has become well-established over recent years that climate change is rarely ever an isolated driver of mobilities, and that it is often impossible to single out climatic changes from broader environmental changes (Foresight, 2011; IPCC, 2022). Furthermore, such changes are always mediated by rules and regulations about resource use and distribution, adequate responses to changes and adaptation policies etc. (see e.g. Baldwin, 2014; Wrathall et al., 2014), rather than constituting purely 'natural' phenomena. To acknowledge these complexities and to indicate the broader dynamics in the natural, socio-economic and political context, in this thesis I refer to '*environmental* mobilities' rather than '*climate* mobilities', and critically examine how and to what effect the term 'climate change' is used in relation to migration and mobilities.

1.3. The research questions

Based on the conceptual and empirical considerations described above, the objective of this thesis is to open up linear conceptualisations of the relationship between climate change and human mobilities, and to interrogate it from a critical and power-sensitive perspective. I developed three research questions to guide this doctoral research:

1. What can an environmental mobilities perspective contribute to the study of the climate change-migration nexus?
2. How do local perceptions of climate change and its related risks shape environmental im/mobilities?
3. How do power relations shape environmental im/mobilities?

These questions are answered in the five chapters that comprise the body of this thesis. The first research question is conceptual, and aims to evaluate how the theoretical approach of environmental mobilities, based on the mobilities approach developed by John Urry and Mimi Sheller (Hannam et al., 2006; Sheller & Urry, 2016; Urry, 2007), can address the research gaps in the study of the climate change-migration nexus described above. This question will be answered in Chapters 2 and 3, where the environmental mobilities approach will be developed and contrasted with earlier research approaches. Furthermore, also the remaining analytical chapters of this thesis will directly and indirectly contribute to answering this research question.

The second and third research questions are analytical and help to develop an understanding of environmental mobilities as embedded in both macro- and micro-level dynamics (see Parsons, 2019; Parsons & Østergaard Nielsen, 2020). The second research question zooms in on local perceptions and sense-making of climate change effects and environmental changes, the associated risks to lives and livelihoods, and what options people perceive to have for responding. This sense-making, it is hypothesised, both affects how people make decisions to engage in environmental im/mobilities, and is in turn impacted by the experience of being mobile. This research question is predominantly answered in Chapter 5, although also Chapter 4 contributes to answering this question.

In contrast, the third research question aims at placing environmental im/mobilities in relation to existing and evolving multi-scalar structures of power. These significantly affect how climate change is locally translated and affects different socio-economic groups unevenly, as well as how these impacts are governed, which shapes the options for response – including mobilities – affected people have (Elmhirst, Middleton & Resurrección, 2018; Greiner & Sakdapolrak, 2016; Zetter & Morrissey, 2014). All three analytical chapters (Chapters 4, 5 and 6) contribute to answering different aspects of this research question.

1.4. Methodological approach

The aim of this doctoral research is to gain an understanding of the climate change-migration nexus from an environmental mobilities perspective and to integrate it with a focus on both risk perceptions and its embeddedness in power relations. Chapters 2 and 3 are more conceptual contributions, developing the approach taken in this thesis. This theory-driven research objective has also determined the research methodology applied in the analytical Chapters 4, 5 and 6: In order to explore the analytical possibilities of the mobilities perspective, I chose a qualitative research approach to analyse different case studies in which the dynamics of climate change and human mobilities come together in various forms. I studied these cases using both ethnographic research methods and well as (in the context of the Covid-19 pandemic) desk research and analysed the collected data inductively. While each chapter provides case study-specific details, this section presents the general research approach and underlying considerations.

1.4.1. Case study selection

For this thesis, I chose an exploratory research approach to study the climate change-migration nexus. This is mostly reflected in the case study selection: Rather than zooming in on one specific case study throughout this thesis, I have chosen cases which differ with regard to the climate change effects observed (rapid- vs. slow-onset) as well as the responses of the local communities and relevant governance institutions (preference for relocation vs. continued residence). This case selection for contrast was not chosen in order to conduct formal comparative analysis, but rather to gain insights into different dynamics of how climate change effects interact with existing and emerging mobility patterns in a variety of contexts (see Robinson, 2016).

I conducted empirical research in two case studies in Chile, which are analysed in Chapters 4 and 5, respectively: a) Monte Patria, an agricultural municipality located 400km north of the capital Santiago, affected by drought and labelled 'the origin of Chile's first climate migrants' (Olivares, 2018), and b) Villa Santa Lucía, a village in Patagonia 1350km south of Santiago, where local residents resist village relocation despite the climate change-related risk of mudslides (see Figure 3).

Figure 3. Research locations in Chile

With two case studies in South America, this research contributes to diversifying the research geography on the climate change-migration nexus (Piguet et al., 2018), which (in English-language academic literature) to date has tended to overlook South America in general and Chile in particular. This is an unfortunate oversight, as with its narrow shape and extension across 4300km north to south, (continental) Chile comprises a large variety of climatic zones that allow to study the natural and societal effects of climate change in a variety of contexts within the same country. Geographically prone to hazards such as earthquakes, volcano eruptions, tsunamis and extreme weather, the country is also considered as one of the more affected countries by climate change, particularly due to drought and increasing desertification in its northern half (IOM, 2017).

In addition, this research engages with processes relevant beyond the country case, such as the interrelation of climate change and human mobilities with water rights, rural poverty and resistance to top-down post-disaster land-use planning. These dynamics are relevant also for the literature review-based Chapter 6, which broadens the empirical scope of the climate change-migration nexus by focusing on flood adaptation infrastructure and community relocation legitimised as climate change adaptation. The cases presented in this chapter serve as illustrations of the potentially mobility-inducing consequences of climate adaptation interventions that can be observed globally (see de Sherbinin et al., 2011).

1.4.2. Research approach

This thesis draws on constructivist epistemology, which has shaped the research focus on subjectivities and perceptions, as well as the ethnographic research methodology. Epistemology is the theory of knowledge, addressing the question of "how [do] we know what we know" (Creswell, 2009, p. 37). Social constructivist epistemology is based on the assumption that people make sense of the world and their surrounding through interactions with each other (hence 'social'); thereby, they "develop subjective meanings of their experiences – meanings directed toward certain objects or things" (Creswell, 2009, p. 26). The researcher's understanding of these varied and complex perspectives is always "co-constructed with that of the [research] participants through their mutual interaction within the research setting and dialogic interaction" (Given, 2008, p. 120), which requires reflection and transparency about the researcher's own positionality in the research process (see Conclusion of this thesis).

With regards to the research topic of this thesis, the constructivist epistemology highlights that our knowledge of and valuation of climate change and its impacts is socially constructed, and thus contingent on current definitions and priorities (Castree et al., 2022; Demeritt, 2001; Klein, 2002). As such, knowledge is placed within broader relations of power that define both which perspectives become hegemonic, and which become silenced (Pfefferle, 2014). This has significant consequences for the governance of climate change and particularly of its societal impacts. A constructivist epistemological approach to studying the societal impacts of climate change, such as migration and mobility dynamics, thus requires a careful analysis of knowledge production and hegemonic discourses about the definition and proposed solution for the 'problem', the alternative interpretations of this issue that as well as the tensions between them (Demeritt, 2001).

The epistemological starting point for this research puts at a centre stage people's experiences and sense-making of both climate change effects, their options for response and their mobilities. This was thus a priority during the empirical fieldwork, which I conducted between October 2019 and March 2020 in the two Chilean locations of Monte Patria and Villa Santa Lucía. Though different in context, my research approach in both locations was similarly characterised by ethnographic methods. These methods allow for "close-up, on-the-ground observation of people and institutions in real time and space", in order to gain an understanding of "how and why agents on the scene act, think and feel the way they do" (Wacquant, 2003, p. 5).

My data collection methods were repeated informal conversations and more formal semi-structured interviews with local residents, participant observation in events, courses and workshops, as well as semi-structured interviews with local politicians and municipality staff, water administrators, scientists, journalists, activists etc. (more details can be found in the respective chapters). Furthermore, I followed the news in local and national newspapers as well as social media relevant to each case. This became particularly relevant as the originally planned return visits to the fieldwork locations became impossible in the context of the Covid-19 pandemic and the prolonged strict travel regulations in Chile. The empirical data was collected in audio recordings, which were later transcribed, and in extensive field logs. These were subsequently analysed inductively through iterative coding and ordering. This inductive approach to data analysis has led to the inclusion of other theoretical approaches that provided useful lenses for understanding the dynamics related to im/mobilities under

climate change; however, the principles of the mobilities approach always served as underlying inspiration for the chapters included in this thesis.

For the literature review-based Chapter 6, information was collected primarily through published reports and academic articles, as well as news and project websites. Furthermore, this chapter draws on earlier primary research by my co-author to make its argument about power and the role of discourse and framing in the governance of climate change adaptation.

1.5. Outline of the thesis

The remainder of this thesis is comprised of five chapters and a Conclusion section. The chapters are based on four journal articles (previously published) and one handbook chapter (under review at the moment of writing). Some of these were slightly adapted for this thesis; this is specified in the explanatory note preceding each chapter.

Chapter 2 is a theoretical proposal to apply the mobilities approach as developed by John Urry and Mimi Sheller (Hannam et al., 2006; Sheller & Urry, 2016; Urry, 2007) and many subsequent contributors, to the case of human mobilities in the context of environmental changes. Based on a review of the shortcomings and challenges of earlier research approaches and conceptualisations, this chapter elaborates on the concept of environmental im/mobilities as proposed by Boas and colleagues (2018) and highlights how, through this lens, a broader range of interrelated mobilities becomes visible as affected by climate change. Furthermore, it emphasises the uneven distribution of mobility potentials, reflecting power relations spanning different scales. This chapter sets the scene for the rest of this thesis.

Chapter 3 is likewise a more conceptual contribution, focusing on the theoretical tenets and methodological implications of the environmental mobilities approach. Written three years after the article appearing here as Chapter 2 and updated for this thesis, this chapter furthermore reviews the significant advances that have been made in this field since it was established in 2018. It thus builds on Chapter 2 and elaborates further on several theoretical concepts, most importantly on the concept of 'climate mobility regimes'.

Chapter 4 is the first analytical chapter in this thesis, based on ethnographic fieldwork in drought-affected Monte Patria in central-northern Chile. In this chapter, I explore why the 'climate migration' discourse used in national news is at odds with local perceptions of climate change and migration pressures. Combining the environmental mobilities approach with an analysis of the political ecology of climate change, this chapter emphasises the role uneven resource access and limited political bargaining power of smallholders in the agricultural economy have in creating a context in which circular labour mobilities to the northern mining sector are considered a normal and potential positive household-level response to economic insecurity.

Chapter 5 is similarly based on an empirical case study in Chile, this one located in Patagonia, southern Chile. This chapter analyses why the population of the mudslide-affected village Villa Santa Lucía prefers to remain in place rather than resettle to safer grounds, despite the dangers of progressing climate change emphasised by scientists and the local government. Through the lens of ontological

security, or people's sense of existential safety, this chapter zooms in on the role of people's sense-making of perceived risks and migration pressures to explore reasons for voluntary immobility in a context characterised by normalised labour and educational mobilities.

Chapter 6 continues with the theme of top-down community relocation in the name of climate change adaptation, in this case as a direct or indirect consequence of flood adaptation infrastructure interventions. The need of protecting the wider population is here used to legitimise these interventions, and the chapter presents cases from the Netherlands, Pakistan and Indonesia in which and policies have been contested by the local populations, with different levels of success. The argument made in this chapter is mainly ethical: Rather than merely technical interventions, this chapter argues that climate change adaptation interventions, especially when used to legitimise displacement and other forms of mobilities, need to be considered as inherently political, and require reflections about the uneven distribution of costs and benefits of adaptation interventions. This chapter broadens the scope of how the relationship between human mobilities and climate change (adaptation) is analysed.

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In the Conclusion chapter, the main findings of this doctoral research are summarised and are put in conversation with each other and the wider literature. I answer the research questions, reflect on the implications of these findings and propose recommendations for future research.

Chapter 2

A mobilities perspective on migration in the context of environmental change

2. A mobilities perspective on migration in the context of environmental change

This chapter outlines the conceptual starting point of the thesis, i.e. why and how the mobilities perspective can contribute to our understanding of the climate change-migration nexus. It has been published as:

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Abstract

Academic, political and policy debates on the connection between environmental change and human migration have long focused on migration drivers and outcomes, resulting in a limited discussion between the discourses of 'desolate climate refugees' and the 'environmental migrants as agents of adaptation'. These perspectives remain dominant particularly in policy and media circles, despite academic critique and the recent emergence of more diverse approaches. In this intervention, we contribute to the recent turn in environmental migration research by seeking to better ground and pluralise our understanding of how environmental change and human mobility relate. We do so by offering a mobilities perspective that centres on the practices, motives and experiences of mobility and immobility in the context of environmental change: when and why do people decide to move – or not to move – in response to environmental changes, how do they cope with migration pressures, how, where do they move, under what conditions, and who can or must stay behind? This approach attends to the diverse aspirations and differential capabilities that underlie particular practices of movement or non-movement, reflecting both individual characteristics as well interconnections with uneven power relations across local, regional and global scales. As such, a mobilities approach offers a starting point for an expanded research agenda on environmental im/mobilities. This enables academic analysis and policy discussion of the climate change-migration nexus to become better attuned to the actual practice and heterogeneous needs of those affected.

2.1. Introduction

The dominant academic, political and policy debates on the connection between environmental change and human migration have long focused on migration drivers and outcomes, rather than on the diverse practices and meanings attached to such movements. As demonstrated in previous review studies (see Bettini, 2013; Bettini & Gioli, 2016; Klepp, 2017; Piguet 2013), the focus of the debate has been characterised by a discursive divide between the so-called 'alarmist'/pessimistic positions predicting masses of 'climate refugees' uprooted by environmental changes in the future, posing risks to the security and stability of the international community (e.g. Myers, 2002; for a critique see Hartmann, 2010), versus more 'optimistic' voices that consider local and regional migrations an important strategy to adapt to environmental changes (Foresight, 2011; McLeman & Smit, 2006). These debates are based on different presumptions about who moves, from where people move, the numbers of migrants, the direction of movement and the distances migrants cover.

In an effort to move beyond this discursive divide and the predominant focus on drivers and outcomes, there has been an academic turn aiming to pluralise and deepen our understanding of the ways in which environmental change and human migration relate (e.g. Arnall & Kothari, 2015; Farbotko, 2018; Klepp & Herbeck, 2016). Recent scholarship has offered more nuanced insights into the lived experiences of new or changing migration pressures under conditions of environmental change, highlighting also the dimensions of power and politics that shape these.

In this intervention, we offer an analytical perspective that supports these academic efforts by making the practices and experiences of mobility and immobility in the context of environmental change central to our understanding. To achieve that, we advocate a mobilities perspective, as developed by John Urry, Mimi Sheller and colleagues (Hannam et al., 2006; Sheller, 2018b; Urry, 2007). It concentrates on understanding movement itself: When and why do people decide to move – or not to move – in response to environmental changes, how do they cope with migration pressures, how and where do they move, under what conditions, and who can or must stay behind? Simultaneously, the mobilities approach considers daily practices within the wider context, embedded in uneven local, regional and global power relations that determine vulnerability to environmental changes as well as im/mobility options.

This perspective enables academic analyses and policy discussions of the climate change-migration nexus to become better attuned to the actual practice and needs of those affected, capturing the diversity of vulnerabilities, the different segments of agency and capabilities, and the contextualised patterns of environmentally-related migration that the growing body of empirical work and critical approaches to the climate change-migration nexus show to exist (see e.g. Arnall & Kothari, 2015; Baldwin, 2016; Boas et al., 2019; Farbotko & Lazrus, 2012; Klepp & Herbeck, 2016; Kothari & Arnall, 2019; Parsons, 2019).

The following section briefly outlines and discusses the dominant 'climate refugees' and 'migration-as-adaptation' discourses, their presuppositions and implications, as well as recent research that has aimed to move beyond this discursive binary. We then introduce the general principles of the mobilities perspective, followed by two sections on the relationality and the differentiality of mobilities and immobilities, embedding within the wider context of social, political and economic inequalities. We end by elaborating on the implications of this mobilities perspective to research on

environmentally induced migration, indicating how the domain of environmental migration may be inspired by developments in other fields of research.

2.2. Discourses on the climate change-migration nexus

2.2.1. The 'climate refugee' discourse

When the climate change-migration nexus entered academia in the 1980s-1990s (Klepp, 2017; Piguet, 2013), the issue was highly problematised: environmental or climate refugees, as a result of their supposed failure to adapt *in situ*, were predicted in large numbers, potentially threatening for global peace (Myers, 2002). This discourse, which has been labelled 'alarmist' by its critics (see e.g. Bettini, 2013; Hartmann, 2010), was – and continues to be – used in debates on the security implications of climate change, assuming that climate change acts as a multiplier of instability and violence leading to "massive population displacements" (Gemenne, 2011a, p. 225).

Scholars have highlighted some fundamental problems with the assumptions of this alarmist discourse, most importantly that it couples a strongly environmentally deterministic view with a victimisation of all potential 'climate refugees' (Bettini, 2013). Many have also criticised the assumption of a simple mono-causal link between climate change and flight, neglecting both individual agency and the wider social, political, economic and cultural factors that influence migration decisions (Black, Adger, et al., 2011; Foresight, 2011). Whole populations are projected as having to flee within or across boundaries when faced with the detrimental effects of climate change. Meanwhile, this discourse neglects existing international, national and local migration patterns, both temporal and permanent, which people in many climate-vulnerable areas are already engaged in for securing their livelihoods. Instead, it simplistically assumes that displacements affect populations that now are stable and immobile (for a critique see Arnall & Kothari, 2015; Klepp & Herbeck, 2016).

Despite this critique, however, the 'climate refugee' discourse continues to be influential in both humanitarian and securitisation narratives. For example, several scholars, politicians and journalists have controversially attributed the Syrian civil war and subsequent 2015-2016 'European refugee crisis' to a preceding multi-year drought, which has contributed to a renewed popularity of the alarmist discourses linking climate change, refugees and conflicts (for a critique see Selby, Dahi, Fröhlich & Hulme, 2017).

2.2.2. The 'migration-as-adaptation' discourse

The late 2000s saw the rise of a radically different perspective to the climate change-migration nexus. Migration became increasingly recognised as having always been an important mechanism of human adaptation to changes in the (natural, socio-political or economic) environment (Black, Adger, et al., 2011; McLeman & Smit, 2006). Both moving outside of risk areas and utilising remittances from emigrated family members for *in situ* resilience-building are important processes in this perspective (McLeman & Smit, 2006; Sakdapolrak et al., 2016). As such, proactive and adaptive environmental migration does not presuppose defenceless fleeing, but controlled and responsible migration to safely decrease household or community vulnerabilities. Climate change responses are equated here with entrepreneurial migration, if necessary with the support of coordinating organisations or institutions (Bettini & Gioli, 2016; Methmann & Oels, 2015).

This perspective has enabled a less alarmist and more progressive view of communities affected by environmental change. It emphasises their agency and indicates ways to achieve more transformative forms of resilience, including how political and societal circumstances shape or restrict these (Black, Adger, et al., 2011; Sakdapolrak et al., 2016). Yet the assumptions of the migration-as-adaptation approach have also received critique. For example, a concern is that, whilst offering a more agentic understanding of migrants and their communities, such a conceptualisation risks placing the responsibility to adapt with individual household or communities. As such, failure to adapt becomes tantamount to individual failure; as a result, issues of climate justice and unequal vulnerabilities across global, regional and local scales risk being silenced (Bettini, 2017; Klepp & Herbeck, 2016). Despite these concerns, key international organisations, including the International Organisation of Migration and the Asian Development Bank, increasingly consider proactive environmental migration as an important individual strategy for adaptation and vulnerability reduction (IOM, 2014).[2]

2.2.3. Pluralising the debate

In the past decade, a number of alternative accounts developed which pluralise our understanding of the relationship between environmental change and human mobility. In particular, we can identify two growing strands of research that aim to sensitise the debate to hitherto underemphasised dimensions of the climate change-migration nexus: Firstly, research centring on the political dimensions of the nexus and its embeddedness in uneven structural relations of power; and secondly, research focusing on grounded accounts and local experiences of environmental changes and migrations. Below, we will discuss both developments in turn.

Research on the political dimension of the climate change-migration nexus criticises that the influence of climatic factors is often overstated, and instead argues that structures of economic and political power as well as hegemonic socio-cultural norms are far more important in determining both affectedness by climate change and migration decisions (Zetter & Morrissey, 2014). In line with this, a growing body of literature also engages with the issues of racism (Baldwin, 2016), postcolonialism (Samaddar, 2017) and biopolitics (Turhan, Zografos, & Kallis, 2015), and emphasises that the debates around environmental migration, as well as the political and governance responses they evoke, are shaped more by powerful political interests rather than by what is happening on the ground (Nicholson, 2014). Such accounts of the climate change-migration nexus, although not yet constituting a unified field of research, are important contributions to the politicisation of this field, which scholars like Baldwin (2014) Bettini (2017) and Klepp & Herbeck (2016) have been urging for.

The second development in the field of environmental migration studies is the growing body of empirical research, which demonstrates that reactions to environmental change-induced migration pressures on the ground are highly heterogeneous. It emphasises how climate change-affected groups or individuals engage in long-established cyclic migration patterns, or instead diversify their environmental change-affected livelihoods in order not to move at all (see e.g. Adams, 2016; Farbotko & Lazrus, 2012; Klepp, 2017). In a similar vein, several studies emphasise the importance of cultural and affective dimensions in environmental migration research, which gives insights into perceptions

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[2] We acknowledge there are different categorisations of the discourses used in the debate (e.g. Ransan-Cooper, Farbotko, McNamara, Thornton & Chevalier, 2015), yet we described the 'climate refugee' versus 'migration-as-adaptation' architypes as the most common characterisations (Bettini et al., 2017; Klepp, 2017). We also acknowledge that several of the aforementioned publications contain more nuances than these architypes, some of which will pick up in the remainder of this chapter.

and responses to climate change effects in the seemingly mundane dimension of the everyday, where people make their (non-)migration decisions at the crossroads of motion and emotion (Kothari & Arnall, 2019; Parsons, 2019). In doing so, this strand of research furthers the efforts of the adaptation-as-migration approach to highlight the perspective of those affected and the diverse ways to cope with change (see e.g. Sakdapolrak et al., 2016). Thereby, this line of research also seeks to move beyond the more simplistic understanding of migration as a linear movement with clearly defined origin and destination which often dominates the climate change-migration debate.

These two recent strands of literature provide critical impulses for moving the debate around the climate change-migration nexus beyond the binary of the persisting dominant discourses, as called for in Baldwin (2014) and Bettini et al. (2017). It allows to diversify our understanding of how people engage with new or changing environmentally induced migration pressures. In this intervention, we build on both lines of research by proposing a mobilities perspective as a systematic analytical approach to offer a grounded understanding of migration pressures and motives arising in the context of environmental and climatic changes, and how these are impacted by relations of (discursive and material) power on different scales.

In the next section, we will elaborate on the mobilities approach as a perspective to developing such a framework. We first outline the general assumptions of this approach before discussing in-depth the elements of relationality and differentiality in relation to human im/mobility, which we consider most useful in furthering our understanding of the climate change-migration nexus.

2.3. A mobilities perspective to environmental migration

While the term 'mobility' is often taken to be a synonym for migration (see e.g. Adger et al., 2018; Farbotko et al., 2018), we here refer to the mobilities approach as a distinct analytical perspective with theoretical and methodological implications (Hannam et al., 2006; Sheller & Urry, 2006; Urry, 2007). Recently, it has found increasing resonance in environmental and migration scholarship (Baldwin, Fröhlich & Rothe, 2019; Boas et al., 2018; Gill, Caletrío & Mason, 2011; Parsons, 2019; Schapendonk & Steel, 2014).

The mobilities approach has developed from active engagement with diverse long-standing bodies of research from various disciplines such as human geography, sociology and science and technology studies (for an excellent overview of its theoretical antecedents, see Sheller & Urry, 2006). Its central tenet is the important role different forms of mobilities – of people, materials, knowledge, ideas, technologies, communications, risks etc. – have in producing and reproducing social relations on local, regional and global scales (Urry, 2007). It focuses on the "complex movements of people, objects, and information, and the power relations behind the governance of mobilities and immobilities" (Sheller, 2018b, p. 3). In doing so, the mobilities approach challenges an understanding of social life as necessarily sedentary, and how movement is often analysed and governed from a largely static perspective (Boas et al., 2018; Gill et al., 2011).

As such, we argue that the mobilities perspective is an analytical approach that can answer to the increasing calls for a diversified understanding of how people react to new or changing migration pressures under conditions of climate change (Arnall & Kothari, 2015; Farbotko, 2018; Klepp &

Herbeck, 2016). In the following two sections, we focus on two aspects of the mobilities approach, relating specifically to human mobilities, which we consider particularly useful in thinking the climate change-migration nexus further. The first is the relationality of mobilities and immobilities, and how they are inseparably interconnected across scales, and thus need to be considered conjointly (Adey, 2006; Hannam et al., 2006). The second aspect is the differentiality of im/mobilities, or why people have uneven capabilities and aspirations for im/mobility practices, grounded in both personal and structural factors (de Haas, 2014; Kaufmann, Bergman & Joye, 2004; Sheller, 2018b). Attending to these two elements, we argue, broadens our understanding of the diverse patterns of environmentally induced migration pressures and im/mobility decision-making, and helps to develop a deeper understanding of how these relations reflect and reproduce uneven relations of power across different scales.

2.3.1. Relational im/mobilities as response to environmental change

The focus of the 'climate refugee' or 'climate migration' discourses lies almost exclusively with those who are (expected to become) mobile, centring on whether this mobility should be regarded as a threat or an opportunity, and for whom. The question of why and how people are *not* migrating in the context of increasing migration pressures by environmental change has received so far only little attention in the academic literature (Adams, 2016; Farbotko, 2018; Klepp, 2017). Thereby, as Zickgraf writes, "[t]he inability to migrate, failed migration or a lack of migration aspirations are excluded from our narratives" (2018a, p. 72). Meanwhile, through family linkages as well as within individual life trajectories, environmentally induced migration is always closely connected to immobility, to dwelling and geographical stability. Indeed, "immobility is inextricably, albeit often invisibly, linked to our understandings of human mobility. [...] Migration and non-migration can thus be seen as two sides of the same coin." (Zickgraf, 2018a, p. 71).

Drawing on scholars like Adey (2006) we therefore want to emphasise here the *relationality* of mobilities and immobilities. An example is the relative mobility of migrants crossing long distances, which does not just involve movement but also moments of rest and temporary stationing in cities along the way. Their trajectory often is not unilinear but might be redirected by new contacts or information received there during these moments of relative immobility (Schapendonk & Steel, 2014). Similarly, relative immobilities might consist of diverse local mobility patterns rather than absolute stillness, which remains unrecognised when only focusing on the distance covered.

In one of the earliest conceptual explorations of how the mobilities approach can be applied to this topic, Gill et al. (2011) highlight how this perspective is particularly useful to study responses to diverse environmental change-induced migration pressures. It "attends to the ways in which [...] persons are repetitively mobile, gradually mobile, seasonally mobile and locally mobile" (Gill et al., 2011, p. 305) – and thus also non-mobile at times – rather than focusing exclusively on exceptional life events of long-distance migration. The mobilities approach also allows for studying how new environmental change-related im/mobilities intersect with previously established patterns of relative mobility and relative immobility, such as traditional seasonal migration patterns in which part of the household (often men) moves while another remains at home (Farbotko & Lazrus, 2012; Klepp & Herbeck, 2016). Furthermore, it attends to how mobilities are configured by immobile infrastructures and institutions (Adey, 2006; Hannam et al., 2006), such as the availability of transport infrastructures or state borders shaping how and to where people move and on what networks they need to rely in order to reach an intended destination.

Summing up this first point, we argue that mobilities and immobilities, including those arising in the context of environmental change, need to be considered as relational. In the words of Sheller, this means understanding them to be "always connected, relational, and co-dependent, such that we should always think of them together, not as binary opposites but as dynamic constellations of multiple scales, simultaneous practices, and relational meanings" (2018b, p.1). In the next section, we zoom further into relational im/mobilities and the different aspirations and capabilities people have for (not) moving.

2.3.2. The differentiality of relational im/mobilities: uneven capabilities and diverse aspirations

The diverse responses to migration pressures induced by environmental change show that im/mobilities are not only *relational*, but also *differential* (Cresswell, 2010; Sheller, 2018b). This means that im/mobilities are highly diverse and uneven in terms of people's capabilities and aspirations to move or not to move, "when, how, and under what circumstances" this takes place (Sheller, 2018b, p. 51), and how it is experienced. These asymmetries reflect and reinforce factors such as uneven personal and network resources as well as different levels of external control "that make it impossible for some people to make certain moves, while it is easy for others; and that enable some to stay still and prosper, while others must move" (Rogaly, 2015, p. 541; see also de Haas, 2014; Richardson & Jensen, 2008; Sheller & Urry, 2006).

This differential character of im/mobilities, we claim, has not been properly conceptualised in the scholarship on environmental migration. In the past few years, this domain has focused disproportionately on what can be considered 'precarious im/mobilities', particularly in the Global South, with research funding from the Global North. In their review of the geographies of research in this field, Piguet, Kaenzig, & Guélat relate this imbalance in research foci to a "post-colonial imagination—which sees the archetypal victim of climate change as a poor peasant from the South" (2018, p. 359). As discussed above, this tendency has been recognised and critiqued in its racial, biopolitical and postcolonial structures (Baldwin, 2016; Samaddar, 2017; Turhan et al., 2015). Yet the continuing influence particularly of the 'desolate climate refugees' discourse in prominent media and political circles, in spite of all criticism, is a manifestation of this imbalance.

This is problematic for two reasons: Firstly, it naturalises the 'precariousness' of mobilities in the Global South by foreclosing inquiry into their relationality, on a global scale, to the more privileged mobilities of people and goods. This enables a 'politics of scale' (Lebel, 2006; Swyngedouw, 2004), a naturalised scale framing in which privileged Northern actors can successfully point the finger elsewhere - at migrants as 'the problem' while ignoring they are part and parcel of the domination structures and processes that keep others in a precarious position. Furthermore, this imbalance in focus also neglects the differential im/mobilities *within* communities in *both* more and less affluent regions. An illustrative example from the Global North in this context are the uneven effects of 2005 Hurricane Katrina in New Orleans, Louisiana, USA: due to various factors, including an insufficient evacuation system, those already marginalised and without access to private vehicles were trapped in the city, and were thus disproportionally affected by the hurricane (see e.g. Adey, 2016; Hannam et al., 2006).

Motility: uneven capabilities to (not) move

To analyse these differential im/mobilities, Kaufmann et al. (2004, p. 750) have developed the concept of *motility,* or the potential for mobility. They consider motility to be comprised of three elements: access (options and conditions), competence (physical ability, acquired skills as well as organisational capability) and appropriation, i.e. how agents "interpret and act upon perceived or real access and skills" (Kaufmann et al., 2004, p. 750). Analysing the potential for mobility helps us to gain a deeper understanding of im/mobility decision-making on the individual level beyond the study of im/mobility practices, as it better reflects the individual's embeddedness in structural inequalities. These are determined by the wider social, political, economic and cultural relations spanning different scales, ranging from the global political economy to socio-cultural norms that impact relationships within the household (Cresswell, 2010; Rogaly, 2015; Zetter & Morrissey, 2014).

We argue that this focus on capabilities for mobility is highly relevant for studying the climate change-migration nexus through an environmental im/mobilities lens. It allows to understand who has the means to become mobile as a means to cope with migration pressures, under what circumstances and how this is experienced. For example, the UK's Foresight Report of 2011 introduces the concept of 'trapped populations' to describe those most vulnerable to environmental changes but lacking the means to move away (Foresight, 2011), i.e. having low levels of motility. The above-mentioned case of Hurricane Katrina illustrates this well: Through the lens of this approach, both material and immaterial factors such as the lack of access to private or social relations' cars for evacuation, the evacuation policies not taking into account the needs of the less affluent, as well as wider socio-political stratifications along "racial, ethnic, class and gender lines" (Adey, 2016; p. 42) contributed to structurally low capabilities for emergency mobility for the vulnerable, 'trapping' whole communities in the city with deadly consequences.

Diverse aspirations about movement

However, empirical research points not only to people's inability (or low motility), but also to their lack of interest in becoming mobile (Adams, 2016; Farbotko et al., 2018; Klepp & Herbeck, 2016; Zickgraf, 2018a). While it is a well-established theme in the displacement and resettlement literature (see e.g. Cernea, 1997), this disinterest or reluctance to move has rarely been conceptualised in the literature on environmental change-induced migration. A noteworthy exception is Adams' (2016) work on migration decisions of Peruvian villagers experiencing intense droughts. She distinguishes a range of factors, such as positive or negative attachment to the current place, resources and fear of/disinterest in alternative places, to explain why some of the population prefer to emigrate while others decide to remain in place despite environmental change-induced challenges to their livelihoods. Farbotko (2018) found similar factors leading to 'voluntary immobility' among Tuvaluans.

In order to develop a grounded understanding of the diverse ways in which people cope with migration pressures induced by environmental change, we therefore need to attend not only to people's capabilities for im/mobilities, but also to their desires to engage in particular im/mobility practices. Borrowing from de Haas' conceptualisation of migration, we can define these desires as 'aspirations', or as "a function of people's general [intrinsic or utilitarian] life aspirations" and their perceived options im/mobility practices (de Haas, 2014, p. 23), both strongly influenced by their levels of motility. While acknowledging their interconnectedness, the analytical distinction between aspirations and capabilities for both mobility and immobility allows to understand why for example immobility for

some might be a choice, whereas for others it might be an undesired necessity, and vice versa (Gill et al., 2011; Kaufmann et al., 2004).

In conclusion, what we have defined in the beginning of this section as uneven im/mobilities, we can now consider to be a reflection of the unevenly distributed levels of motility people have to fulfil their im/mobility aspirations. Understanding the im/mobility practices people engage in under conditions of environmental change thus implies detailed attention to individual aspirations and capabilities, and how these are nested in wider power relations across local (e.g. inequalities in the household or community), national and regional (e.g. migration regimes) and global scales (e.g. global capital flows) (Cresswell, 2010; Hannam et al., 2006; Richardson & Jensen, 2008). In considering this embeddedness of heterogeneous local im/mobility practices, the mobilities approach contrasts with the 'desolate climate refugee' and the 'environmental migrant as agent of adaptation' discourses that consider human mobility under conditions of climate change in relative isolation from the wider politics of climate change and human migration.

2.4. Conclusion

We have argued here that the mobilities approach can generate grounded insights into the highly diverse real-life impacts of environmental change-induced migration pressures, thereby furthering the recent developments in the field of environmental migration studies. The mobilities approach calls attention not only to one-off long-distance movements, but also to more varied forms of local, seasonal or gradual mobilities, all intertwined with temporary immobilities. By overcoming the limited focus on those (expected to become) mobile in the context of environmental change, such an understanding of im/mobilities opens up a broader perspective on the climate change-migration nexus than the persisting discourses of the 'desolate climate refugee' and the 'environmental migrant as agent of adaptation' allow for.

In particular, the mobilities perspective emphasises a *relational* understanding of *differential* im/mobilities. This implies zooming in on the interrelatedness of mobilities and immobilities, both within individual trajectories and across households, communities and larger scales, and why this interrelatedness is inherently political. In that context, the concept of motility offers insights into how im/mobility practices are not only based on individual characteristics and resources, but are also embedded in power relations spanning simultaneously local, regional and global scales, creating and reinforcing differential im/mobility capabilities.

Incorporating the recognition of the effects of uneven power structures in our framework resonates particularly with recent calls by critical environmental migration scholars for greater climate and mobility justice (Bettini et al., 2017; Klepp & Herbeck, 2016; Sheller, 2018b). These claim that anthropogenic climate change needs to be considered as an inherently political phenomenon, given that those most affected by the uneven impacts of CO_2 emissions are not the emitters themselves. Yet, as the mobilities approach highlights, the political nature of climate change is not only reflected in this asymmetry of effects, but also in the unequal capabilities people have in coping with environmentally induced migration pressures. Foregrounding the differential capabilities for fulfilling im/mobility aspirations is thus crucial for understanding how mobilities and immobilities relate and

intersect with the wider politics of environmental change, and how unjust relations might be overcome.

As such, we consider the mobilities approach as an analytical starting point for an expanded research agenda on environmental im/mobilities. An epistemological base for such research, as outlined above, must be to consider "slowness alongside acceleration, blockages, stoppage, and friction as much as liquidity and circulation, and coerced movement as much as freedom of movement" (Sheller, 2018, p. 3). Such a lens, we propose, can inspire new empirical research, innovative research foci and mobile methodologies. Examples of potential future explorations are the tracing of mobilities, including moments of forced or voluntary stillness, or the intersection of corporeal im/mobilities with the mobilities of discourses and knowledge (Boas, 2019; Merriman, 2014; Schapendonk & Steel, 2014). This, together with an increasing engagement with discussions relevant to the climate change-migration nexus in the literatures on broader migration and refugee studies, human geography and anthropology, can provide the grounded insights necessary for informing sound analysis of what it means to move or not move in the context of environmental change. This can help to better attune debates within academic, political and policy domains to the daily practices and heterogeneous needs of those affected.

Chapter 3

The Environmental Mobilities approach, its theoretical basis and methodological implications

3. The Environmental Mobilities approach, its theoretical basis and methodological implications

Chapter 3 continues the theoretical work started in Chapter 2 and elaborates further on the environmental mobilities approach, its implications for governance and research methodology. As this chapter was written three years later and has been updated for inclusion in this thesis, it also reflects on the rapid developments in the field of 'climate migration' studies that have taken place in the meantime, particularly with regards to the application of the environmental im/mobilities concept. This chapter, co-authored with Dr Ingrid Boas and Dr Carol Farbotko, is currently under review for the Handbook on Environmental Migration (Edgar Elgar). To avoid repetition with Chapter 2, the review of other approaches to the climate change-migration nexus has been significantly shortened.

Wiegel, H., Boas, I. & Farbotko, C. (under review). The Environmental Mobilities approach, its theoretical basis and methodological implications. In F. Gemenne & C. Zickgraf (eds). *Handbook on Environmental Migration*. Cheltenham: Edward Elgar.

3

Abstract

This chapter outlines a theoretical and methodological approach to the environmental change-migration nexus called *Environmental Mobilities*. Building on the mobilities approach developed by John Urry and Mimi Sheller, the Environmental Mobilities perspective examines how people are affected by, and engage in, different mobilities to respond to environmental changes. Empirical insights into how people move in the context of climatic and environmental changes show that such mobilities typically are relatively short-distance, temporary or even seasonal, and are thus much more dynamic than the one-off long-distance movements assumed in 'climate refugee' narratives. Furthermore, mobilities are typically not novel, but are deeply embedded in established and evolving mobility patterns. This chapter outlines several elements central to studying environmental mobilities, such as the close relationship between mobility and immobility (i.e. staying in place), the intersection of human mobilities with the mobilities of knowledge, capital, communication and risks, as well as the unevenly distributed autonomy people have in deciding about their own im/mobilities, and how these are governed by 'climate mobility regimes'. Reviewing how this novel approach has been applied over the last years, we conclude that the environmental mobilities approach brings novel insights contributing to the evolving debates on the climate change-migration nexus.

3.1. Introduction

The study of the relationship between climate change and human migration and mobility has undergone numerous evolutions in the previous decades, since it became established in academia in the 1980s. The debates have ranged from dystopian prognostics about the numbers of future 'climate refugees' to more optimistic 'migration-as-adaptation' discourses (El-Hinnawi, 1985; Myers & Kent, 1995; Myers, 2002; Biermann & Boas, 2010; Black, Bennett, et al., 2011; Bettini, 2013, 2014; for overview references, see Klepp, 2017; McLeman & Gemenne, 2018; Boas & Wiegel, 2021a). In recent years, it has become more firmly established that an important – and hitherto largely neglected – element of studying the climate change-migration nexus are empirically-based approaches that are sensitive to a) the political nature of how climate change is translated both globally into particular narratives about human mobility and locally into perceivable environmental effects, b) how communities are affected by these, and c) what options (including migration) they have to respond (Bettini et al., 2017; Boas et al., 2019; Klepp & Herbeck, 2016; Kothari & Arnall, 2019).

One such approach that has gained increasing recognition in recent years is the *environmental mobilities* perspective, which is the focus of this chapter. Building on the mobilities approach coined by John Urry and Mimi Sheller (Sheller & Urry, 2006; Urry, 2007), the environmental mobilities perspective examines both how people's mobilities are affected by climatic and environmental changes, and how they might respond to these changes through mobilities (Boas et al., 2018, 2019, 2022; Cundill et al., 2021; Parsons, 2019; Sheller & Urry, 2006; Wiegel, Boas & Warner, 2019). For example, empirical insights show that environmental mobilities typically take the form of relatively short-distance and temporary or seasonal movements, and are thus much more dynamic than the one-off long distance movements assumed in 'climate refugee' narratives (Blondin, 2020; Harms, 2015; Zickgraf, 2018b, 2022). Also, they are typically based on previously-established mobility patterns, rather than completely new forms of migration (Jarillo & Barnett, 2021; Whyte, Talley & Gibson, 2019), and are closely related to immobilities, for example in the form of household members who stay at home and with whom the migrated household members maintain close relationships (Blondin, 2022; Porst & Sakdapolrak, 2018; Rockenbauch, Sakdapolrak & Sterly, 2019; Zickgraf, 2018, 2022).

After outlining what the environmental mobilities approach is and how it has been applied so far, we will explore these elements in more detail, and also discuss the methodological implications of this approach.

3.2. The origins and foundations of the environmental mobilities approach

The environmental mobilities approach was developed in response to approaches that analysed migration and mobilities in the context of a changing climate as isolated from existing mobility patterns, uneven relations of power and local perceptions of risks and response options. As has been described in the Introduction and Chapter 2, the earliest research on the climate change-migration nexus was predominantly focused on numerical predictions of population movements due to climate change. This was later contested by research focusing on migration drivers in a multicausal

understanding of migration decision making, and on the potential for migration as household-level adaptation to climate change[3].

While these discourses focus on drivers of migration – either in a mono- or multicausal way – and its implications – a potentially threatening mass of refugees or a legitimate form of individual adaptation – both perspectives portray migration as linear and exceptional, as a decision only taken because of advancing climate change. Yet linearity and exceptionality do not sufficiently account for ways in which different forms of migration and mobilities are already central to many life stories, family networks, household income strategies and also cultures around the globe (Sheller, 2018b; Sheller & Urry, 2016; Urry, 2007).

This mobile reality is exactly what the mobilities approach focuses on. Its central tenet is that mobilities – not only of people, but also of money, risks, information, diseases, etc. – already very much shape our societies and politics in this globalised world (Sheller & Urry, 2006). The mobilities approach has been developed by John Urry and Mimi Sheller (Hannam et al., 2006; Sheller, 2018b; Sheller & Urry, 2006; Urry, 2007), and draws on sociology, human geography and science and technology studies. It has led to a mobilities turn in social sciences, which takes a stand against the sedentary understanding of social life and the exceptionalisation of mobilities, by claiming that "rather than examining people, society, and economy as if rooted in places, there is a need to recognise that life consists of mobile practices. In other words, people are mobile subjects who constantly move about to interact, work, consume, and so on, and need to be comprehended as such" (Rogers, Castree & Kitchin, 2013, n.p.).

Founded on the mobilities approach, the environmental mobilities perspective turns around the questions typically asked about the climate change-migration nexus: its emphasis is on exploring the practices, meanings and representations of (often already established) mobilities, both long and short in distance and time, in the context of a changing climate, not on finding causalities (be they singular or multifaceted) between climate change and migration. As Boas et al. (2019) write, from this perspective, research on the topic

> "should examine and address climate mobilities as the new normal, rather than the exception. Movement and migration are inherent to the highly interconnected world we live in and a standard element of social life. As such, mobility will necessarily be part of the range of responses available to those affected by climate change. Instead of asking whether climate change causes human mobility, research should focus on whether (and if so, how) climate change will alter existing interconnections and human mobility patterns under different scenarios of global warming and mitigation and adaptation policies, and how these are in turn shaped by existing mobilities" (p. 902).

While thus challenging the hitherto dominant perspectives on the climate change-migration nexus, the environmental mobilities perspective has a rather broad range of potential applications, reflecting the variety of ways climate change can shape human mobilities. This is reflected in the wide array of cases to which this perspective has been applied. So far, it has been employed to study, for example,

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[3] The review section in Chapter 3 has been shortened to this paragraph in order to avoid repetition, thereby reducing detail and nuance. In practice, these two discourses also co-exist in different arenas. Particularly the alarmist discourse frequently gets reproduced in policy and media circles despite the critiques this perspective has received (see Boas et al., 2019).

transformative mobilities among Pacific islanders (Farbotko et al., 2018); immobilities as resistance to dominant climate migration discourses (Farbotko et al., 2020; Suliman et al., 2019); the maintenance of belonging or customary livelihoods (McMichael, Farbotko, Piggott-McKellar, Powell & Kitara, 2021; Zickgraf, 2018b, 2019); the consequences of lacking mobilities potential (Blondin, 2020, 2021b, 2022) and its interaction with infrastructures (Blondin 2023); how both fishers and pastoralists adapt their mobilities based on communication technologies (Boas, 2020, 2022); how short-term labour mobilities can enable can enable communities to stay in their homes when locally the economic options dwindle in the context of a changing climate (Zickgraf, 2022); and how the narrative of 'climate migration' in itself is mobile and gets mobilised (Durand-Delacre, 2022a, 2022b). Despite the wide array of study foci, the environmental mobilities perspective has a number of central elements and methodological implications, which we will discuss in more detail below.

3.3. The relationality of im/mobilities

One of the central principles of the environmental mobilities approach is the multi-scalar relationality between mobilities and immobilities. Simply put, this means that mobilities should not be considered as isolated, but as always in relation to each other and to the non-mobile (Blondin, 2021a; Zickgraf, 2018a). Socio-economic power relations affect climate mobilities in multiple ways. For example, on a global scale, the hypermobility of the wealthy minority contributing to climate change through CO^2 emissions needs to be considered in relation to the climate mobilities of those most affected by sea-level rise, droughts or extreme weather events (see Sheller, 2018a, 2018b). On a national level, the relative immobility of some parts of the population, for example made possible through infrastructural climate change adaptation interventions that allow them to stay in their homes, might involve the displacement or relocation (i.e. forced mobility) of other parts of the population to make space for this very intervention (Chapter 6). Employers in horticultural industries that are dependent on the seasonal mobility of informal workers have, inequitably, passed the costs of climate adaptation programs on to their already marginalised and vulnerable workers, exacerbating inequities between immobile landowners and mobile labourers (Turhan et al., 2015).

In terms of empirical research, the relationality of climate mobilities is particularly visible at the community and household level: While the climate migration discourse prioritises the outmigration/relocation of entire communities, or at least the whole household, empirical studies show that especially in cases of slow-onset changes it is typically only one or two people of a household or community that move temporarily, seasonally and/or repeatedly (Blondin, 2020; Harms, 2015; Jarillo & Barnett, 2021; Rockenbauch et al., 2019; Zickgraf, 2018b). For instance, young adults might move from a rural agricultural context to work in urban industries in order to send remittances to their parents, which contribute to the overall household income when environmental or climatic changes decrease agricultural production (Natarajan, Brickell & Parsons, 2019; Porst & Sakdapolrak, 2018). Thus, the temporary mobility of some (e.g. moving to the city) can enable the relative immobility (i.e. staying in place) of the household as a whole through the mobility of remittances from the urban to the rural context. This is a well-known and long-established pattern of mobility, not only in the context of environmental changes. Such temporary mobilities can contribute to adaptation, such as in rural areas of the Solomon Islands, as Solomon Islander temporary workers return home after fulfilling short-term contracts working on Australian farms, to invest their skills and earnings in resilience-

building assets such as water infrastructure, education and farming tools (Dun, McMichael, McNamara & Farbotko, 2020).

Just as the relationality of mobilities and immobilities can stretch across space, it can also stretch across temporal scales. As for example Blondin (2020, 2021a, 2022) shows, residents in the isolated Bartang valley in Tajikistan depend on adequate infrastructure to be able to engage in necessary short-term mobilities, such as travelling to urban centres for educational, health and public services. Without access to such necessary short-term mobilities, for example when roads are increasingly blocked due to climate change-related extreme weather events or when they decay due to lack of maintenance and public funding, remaining in the isolated valleys becomes increasingly difficult. This increases the likelihood of the local population relocating closer to the cities, i.e. engaging in long-term migration.

Through this focus on relationality, the environmental mobilities perspective thus also attends to the complexities of staying in place under conditions of a changing climate, where habitual livelihood patterns may become inviable or homes may be exposed to risks such as sea level rise, floods or mudslides (Blondin, 2021b; Farbotko & McMichael, 2019; Wiegel, Warner, Boas & Lamers, 2021). Due to the so-called sedentary bias (normalising staying in place and exceptionalising migration and mobilities), these difficulties have long been neglected in studies of the climate change-migration nexus (Black, Arnell, Adger, Thomas & Geddes, 2013; Dahinden, 2016; Schapendonk, Bolay & Dahinden, 2021; Zickgraf, 2019). While the 2011 Foresight Report introduced the notion of involuntarily 'trapped' populations (Ayeb-Karlsson, Smith & Kniveton, 2018; Foresight, 2011), the environmental mobilities perspective can "be understood as an invitation to dig deeper into the context-specific motives and interpretations of moving and remaining, [... by neither] victimising those who move, nor generically celebrating them as some form of cosmopolitan subjects" (Boas & Wiegel, 2021a, p. 92).

Overall, this attention to relationality of im/mobilities turns around the common assumptions of 'climate refugee' and 'climate migration' discourses regarding linear long-distance movements, by highlighting how short-term, repeated or short-distance mobilities are closely related to, and sometimes necessary for, relative immobility. The environmental mobilities perspective holds that we need to study such mobilities and immobilities in conjuncture, as they relate to each other across social, spatial and temporal relations[4].

3.4. Human im/mobilities intersecting with other mobilities

While most studies applying the environmental mobilities perspective predominantly focus on human im/mobilities, there is a small but growing body of research explicitly about the intersections with other types of im/mobilities, such as material or informational mobilities (Arnall & Kothari, 2020; Blondin, 2021b; Boas, 2020; Madianou, 2015; Parsons, 2019; Sheller, 2018b). This interest again builds on the focus of the mobilities paradigm on "different modes of mobilities and their complex

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[4] The relationality of im/mobilities closely relates to the translocality approach, which "refers to the connectedness of mobile and immobile actors across space, linking and reshaping places, transgressing their boundaries, and spanning a social field that encompasses multiple socio-spatial levels" (Porst & Sakdapolrak, 2018, p. 36). For further reading, see e.g. Greiner & Sakdapolrak (2013), Sakdapolrak et al. (2016) and Parsons (2019).

combinations: corporal travel of people; physical movements of objects; virtual travel often in real-time transcending distance; communicative travel through person-to-person messages; and imaginative travel" (Sheller & Urry, 2016, p. 11). Understanding such intersections can capture why some mobilities are blocked while others are facilitated, shaped by a complex set of human and material dimensions. Blondin's work (2020, 2021a, 2023), already mentioned above, is a primary example of that: In her Tajikistan case study, she examines how road infrastructures damaged by environmental hazards hamper the necessary daily mobilities of people in remote mountainous valleys. In doing so, she combines an analysis of physical with human im/mobilities, and how they shape each other.

What is still largely lacking in this emerging research line of environmental mobilities are studies that take the socio-material or physical mobilities (e.g. the road, or the phone, or a cyclone pattern) as the primary unit of analysis. While some studies look at the role of e.g. digital communication or road infrastructures for im/mobilities (e.g. Bettini, Gioli & Felli, 2020; Blondin, 2021a; Boas, 2020; Madianou, 2015), they primarily take human movements as the starting point of analysis. Future research could take the environmental mobilities approach further on this point, by centring for example on an object or environmental event and its im/mobile dynamics in order to understand its implications (Boas, Kloppenburg, van Leeuwen & Lamers, 2018; Iles, 2004). A notable example in this context is the recent work by Arnall and Kothari (2020) who follow the intersections between waste flows and people's daily encounters with waste to understand place-making in the Maldives.

3.5. Uneven im/mobilities

Apart from the relationality of im/mobilities, another central tenet of the environmental mobilities approach is uneven distribution of the capacity to self-determine one's im/mobilities. This means that people are unequally affected by environmental changes, and have uneven options to decide on "when, how, and under what circumstances" their mobilities take place (Sheller, 2018b, p. 51), or whether they can stay in place. Their autonomy to make these decisions is influenced for example by personal and network capital, varying levels of external control as well as social and cultural norms, all of which have historical roots. As Cresswell (2010, p. 21) writes, "[m]obility is a resource that is differentially accessed", reflecting and reinforcing uneven relations of political and socio-economic power (Parsons, 2019). While this kind of inequality is central to the discourses around 'precarious climate refugees' from the Global South, which tend to be generally assumed to be involuntary mobile (i.e. without the capabilities to fulfil their aspirations to stay in place), such unequal distribution of mobility potential and autonomy about im/mobility decision making can be found among populations all around the globe.

This uneven potential for mobility has been captured by Kaufmann, Bergman and Joye (2004) in the term *motility*. This analytical tool prioritises the potentiality of movement over its enactment, and thus provides deeper insights into the unequally distributed decision-making power regarding one's own im/mobilities (Blondin, 2020; Zickgraf, 2018a). This might be studied through a distinction between im/mobility aspirations (i.e. the desire to move, or not to move), and the capabilities to fulfil these aspirations (Carling, 2002; Carling & Schewel, 2018; de Haas, 2014; de Sherbinin et al., 2022) . This analytical distinction, though often less clear-cut in practice, helps to understand the difference

between the those who stay in a climate change-affected area out of choice (see e.g. Adams, 2016; Farbotko & McMichael, 2019), and those who lack the means, or are culturally prohibited, to move elsewhere (Ayeb-Karlsson, 2018; Ayeb-Karlsson et al., 2019). Though both examples are about relative immobility, one has the potential to move, whereas the other doesn't – their relative immobilities are thus of a very different quality. This shows that it can be more insightful to pay attention to motility (or the potential for movement) rather than observed (non-)movement.

For analysing im/mobilities, Cresswell writes in *Towards a politics of mobility* (2010), it is thus not sufficient to focus only on movement itself, but also on its practice (i.e. how it is experienced, and under which circumstances it takes place) and its representation (i.e. how is it framed). Climate migration, as we have shown above, has been represented as both a potential threat to international security and a potentially positive adaptation to climate change. The environmental mobilities approach itself aims to not engage such valuing (neither negative nor positive), but rather attends to the everyday practices, representations and experiences that are shaped by, reinforcing or changing, unequal relations of power (Boas et al., 2019).

3.6. Governance through climate mobility regimes

The environmental mobilities lens can furthermore be employed to study how the relationship between environmental change and mobilities is governed by so-called *climate mobilities regimes* (Boas, Wiegel, Farbotko, Warner & Sheller, 2022; Farbotko, 2022). This concept builds on Glick Schiller and Salazar's (2013) work on mobility regimes, which allow us to theorise and examine "how mobilities become normalised, facilitated but also hampered, stigmatised, or exploited" (Boas et al 2022, p. 7). Mobility regimes have been defined as intersecting regulatory systems that normalise the movements of some who move while making unlawful and/or limiting the movement of others, and as such are broader than the institutions of the nation-state, including also sub- and supra-national organisations as well as discourse-shaping media and scientists (Glick Schiller & Salazar, 2013). Another inspiration for this conceptualisation is Paprocki's work on climate adaptation regimes, which she defines as "a socially and historically specific configuration of power that governs the landscape of possible intervention in the face of climate change" (Paprocki, 2018, p. 957).

Drawing on both Glick Schiller & Salazar (2013) and Paprocki (2018), climate mobility regimes[5] are an as-yet little-used conceptual tool in the new environmental mobilities body of research, yet arguably with much scope for theoretical exploration and fruitful empirical application (Boas et al., 2022). They are defined as the (in)formal governance arrangements seeking to "frame, manage, and regulate the relation between mobilities and climate change in a particular manner" (Boas et al., 2022, p. 7). Climate mobility regimes are understood as networked arrangements that involve a range of actors in addition to state governments, such as intergovernmental organisations, NGOs, scientists, and the media (Boas et al., 2022), reflecting "the aggregate effects of the actors composing it" (Paprocki 2018, p. 956).

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[5] While I generally refer to '*environmental* im/mobilities' in this thesis to emphasise the complexities of isolating climatic changes from broader environmental changes and their governance contexts (see Introduction), the concept of '*climate* mobility regimes' was chosen by Farbotko (2022) and Boas et al. (2022), inspired by Paprocki's 'climate adaptation regimes' (2018), specifically to draw critical attention to how and for what purpose the label of 'climate change' is used in im/mobility governance. I have left it in its original form for this thesis.

Regimes are multiple and shifting, and "may in themselves be contradictory or overlapping but as a whole steer the governing of climate mobilities in a particular direction" (Boas et al. 2022, p. 7; see also Schapendonk 2018).

This concept is useful for examining the ways in which climate mobilities become institutionalised and operationalised, and through which certain climate mobilities become the subject of policy and regulation, while others do not (Farbotko et al., 2020). For example, the securitisation of the 'climate migration' debates as a consequence of the alarmist 'climate refugee' narrative predicting chaos and threats to security, which continues to inform negotiations on climate change adaptation governance can be considered a dominant climate mobility regime. Similar to Cresswell's (2010) assertion that mobilities are not only movement, but also practice and representation, this approach considers the power to shape the representation of environmental mobilities to be of central importance.

Importantly, the climate mobility regimes concept also provides a lens to study contestation and resistance to these regimes. Farbotko (2022), for example, has studied return mobility to Funafala, an islet part of Tuvalu typically associated with diminishing habitability under climate change, as acts of resistance to the dominant climate migration regime on 'climate displacement'. She critically assesses how this dominant regime is based on "(post-)colonial understandings of climate-vulnerable communities in the Global South" (Boas et al., 2022, p. 8) that neglect Indigenous knowledge of the environment and local understandings of climate risks.

In analysing the regulation and steering of environmental mobilities, authors increasingly also engage with the normative element of justice, particularly as developed by Mimi Sheller (2018a, 2018b) as the intertwinement of mobility and climate justice. As she writes, "[m]obility justice is an overarching concept for thinking how about how power and inequality inform the governance and control of movement, shaping the patterns of unequal mobility and immobility in the circulation of people, resources and information" (2018b, p. 14). It addresses questions about how the rights to dwell and the rights to move of those most affected by climate change are protected and addressed by environmental mobility regimes, especially since they often are part of those populations who have least contributed to climate change themselves. The mobilities justice imperative, we think, asks environmental mobilities research to be especially attentive to the multiple, potentially unfolding and shifting, and perhaps unexpected ways in which mobility regimes can and cannot shape just outcomes for marginalised people, and this is a much more complex question than simply moving people out of harm's way.

3.7. Methodological implications of the mobilities approach

The environmental mobilities perspective also has methodological implications. First of all, given its focus on grounded realities, much of the research is focused on ethnographic data examining how people practice, negotiate and give meaning to their everyday im/mobilities. A growing number of studies for instance examines the emotional dimensions connected to im/mobilities in the context of environmental change, looking at daily experiences and perceptions of moving or of resistance towards moving (Adams, 2016; Blondin, 2021a; Farbotko & McMichael, 2019; Kothari & Arnall, 2019; Parsons, 2019; Suliman et al., 2019). Such work takes into account the cultural situatedness of

mobilities, such as the roles of indigenous knowledge, history and context (Suliman et al., 2019; Whyte et al., 2019). For example, Suliman and colleagues (2019) have explained how today's resistance amongst Pacific Islanders towards the common-held perception that they are the first-ever climate refugees can be understood by looking into Indigenous mobilities and perceptions of place. Such research helps to make sense of the wider political contexts – as to how global or Western-driven discourses are framing environmental-mobility relations in particular terms and how these are resisted by those most exposed to climate risk (Farbotko & McMichael, 2019; Mortreux & Barnett, 2009; Suliman et al., 2019).

As environmental mobilities examines *movements*, much of the research involves mobile methodologies, such as travelling with people or objects, mapping of mobilities and networks using mobile video ethnography, and on that basis aiming to reconstruct im/mobility stories (Büscher & Urry, 2009; Butz & Cook, 2018; Hein, Evans & Jones, 2008; Spinney, 2011). To return to the earlier example from Blondin's work (2021a), who as part of her research method participated in road travel and walks to co-experience the impact of natural hazards upon the daily mobilities of people in the Bartang Valley in Tajikistan. Boas (2020) in turn traced the social and informational networks that people in Bangladesh rely on in their mobility decision-making. Alternatively, Pas Schrijver (2019) examined im/mobility dynamics by examining the long-distance herding practices by pastoralists in drought-affected Northern Kenya by staying in places with those who resided at the homestead, typically the female population.

Given that environmental mobilities research is heavily engaged with ethnographic work, reflexivity on part of the researcher is crucial in order to obtain representative and ethical data (Boas, Schapendonk, Blondin & Pas, 2020; Merriman, 2014). Moving with research participants can entail a certain level of invasion in someone's personal life, requiring constant interactions with the research participants about whether they (still) want to be 'followed'. Such interactions may also in turn influence the mobility choices of research participants (Law & Urry, 2004). This leaves to wonder "[w]hat does this intertwining mean for the research and, more importantly, for the people we work with and write about?" (Boas et al., 2020, p. 143). Furthermore, as most of the researchers in this field come from the Global North researching locations in the Global South (Piguet et al., 2018), reflections on one's own positionality and perspective is of utmost importance (Merriman, 2014). Boas and colleagues reflect in their co-authored article on mobile methods that the risks of misrepresentations are high, given that "despite our reflexivity and local preparations [we] still started from our default Western gaze with which we studied non-Western mobilities" (2020, p. 143), e.g. by wanting to understand the exceptional types of mobilities as opposed to the mundane ones.

3.8. Conclusion

This chapter has presented state-of-the-art research on the environmental mobilities approach and has outlined the manifold implications this perspective has for developing, implementing and representing research on the relationship between climate change and human mobilities. As we have explained in this chapter, this perspective allows the study of both how people's livelihood mobilities are affected by climatic and environmental changes, and how they can and do respond to these changes through mobilities. This lens particularly "highlights the everyday and local realities, [… and

how] highly localised, contextualised and diverse patterns of mobility" are embedded in these (Boas & Wiegel, 2021a, p. 92). Mobilities, also and particularly in the context of a changing climate, are thus reflective of and/or reinforcing underlying structural inequalities. They need to be understood in relation to the im/mobilities of the wider community, as well as with objects, ideas, environmental risks and technologies. To study these, scholars utilising the environmental mobilities approach tend to focus on ethnographic and mobile methods, focusing on people's movements, their interpretation and representation.

Future research applying the environmental mobilities perspective could further deepen this critical engagement by better integrating bottom-up experiences of climate change with climate mobility regimes, in order to bridge (the divide between) agentic and structuralist approaches (Parsons 2019). For this we can again learn from related disciplines, such as wider migration studies, in which several studies have used grounded approaches (e.g. the study of migrant trajectories) to examine how mobility regimes affect people's (e.g. communities, migrants, etc.) lives, and how they challenge or even co-shape the rules of the game from below or in interaction with regime actors (Schapendonk, 2018; Schapendonk, van Liempt, Schwarz & Steel, 2020; Schwarz, 2020). In these ways, the environmental mobilities perspective, and the future research directions it argues for, seeks to learn from and engage with established and related disciplines and approaches to advance our understanding of the climate change-migration nexus.

Chapter 4

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

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

4

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 chapter 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 chapter 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 chapter 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.

4.1. 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 et al., 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 such 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, this study found this 'climate migration' framing has only little resonance locally.

Addressing this discrepancy, this chapter provides an alternative reading of the case of 'Chile's first climate migrants', inspired both by the environmental mobilities approach (Boas et al., 2018; Wiegel et al., 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 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 chapter 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 locally 'living a good life'.

This chapter 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 chapter ends with a discussion of the lessons learned from this analysis for future research and policy making on environmental im/mobilities, particularly in rural agricultural settings.

4.2. Towards a political ecology of environmental mobilities

4.2.1. 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), moving the debate "towards a focus on how the climate is experienced, guides action and creates meaning in doing so" (Parsons, 2019, p. 684).

One theoretical perspective of growing relevance for examining the complicated and multi-layered relationship between climate change and migration is the mobilities approach (see e.g. Baldwin et al., 2019; Blondin, 2021a; Cundill et al., 2021; Gill et al., 2011; Parsons, 2019). 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 et al., 2006; Sheller, 2018b; Sheller & Urry, 2006; 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). 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, 2018b, 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 et al., 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).

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4.2.2. 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-migration (or 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 (see Elmhirst et al., 2018; Greiner & Sakdapolrak, 2016; Parsons, 2019). One way to remedy that, this chapter 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 straight-forward. 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; Greiner & Sakdapolrak, 2016; Marino & Ribot, 2012; Parsons & 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 et al., 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 et al., 2019; Porst & Sakdapolrak, 2018; Radel et al., 2018). In a similar vein, Elmhirst, Middleton & 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.

4.2.3. 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 et al., 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). 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 (see Cresswell, 2010). As reflected in the empirical sections of this chapter, such multifaceted research approach can provide important insights into how both elements of the climate change-migration (or mobility) nexus are inherently linked and contextually embedded.

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4.3. Case description and methodology

4.3.1. Case study description

Stretching over 4300km 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 Figure 4), 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 Figure 5) (Municipalidad Monte Patria, 2018). The total surface of the municipality is 4,366.9 km², bordering in the east with Argentina. Statistically, ca. 30% of the population are considered as poor, which is twice the national average (Municipalidad Monte Patria, 2018).
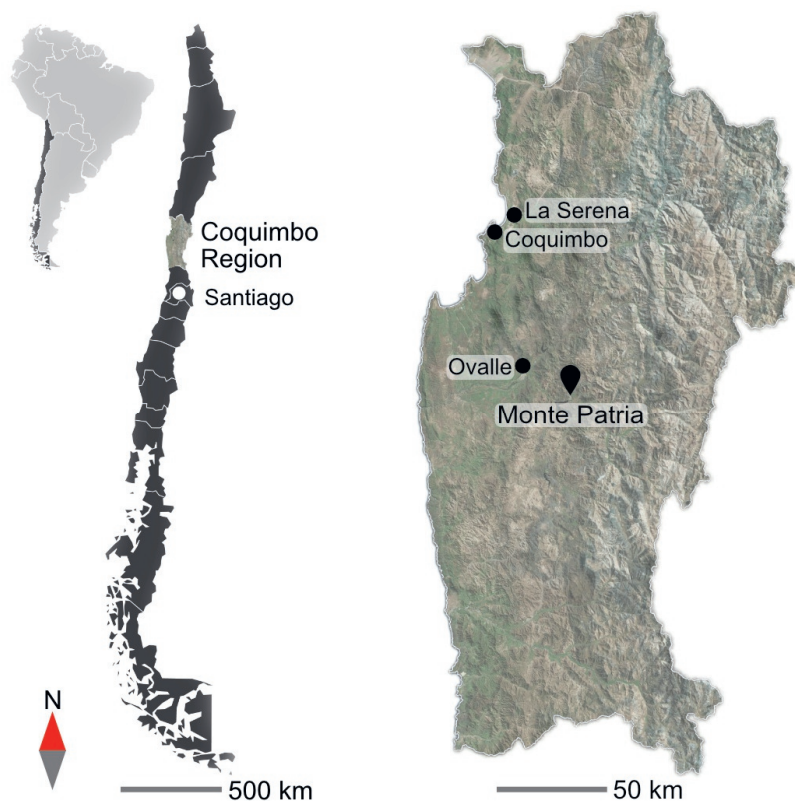
Figure 4. Coquimbo Region, Chile
Depicted are the main regional urban centres and the research location. (Own elaboration based on Microsoft Maps)
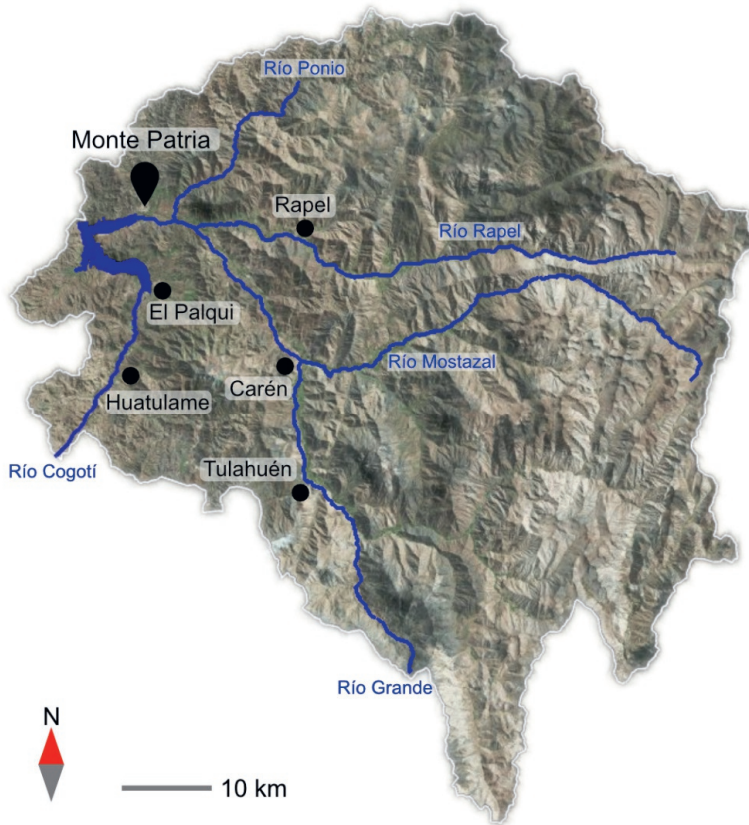
Figure 5. The municipality of Monte Patria
Depicted are the main town Monte Patria, five larger villages as well as the five main
rivers/valleys of the municipality. (Own elaboration based on Microsoft Maps)

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[6]
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 (traditionally 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.

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

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 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[7], 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.

4.3.2. Research methodology

This chapter 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[8]. Furthermore, 11 follow-alongs (see Boas et al., 2020; Büscher & Urry, 2009) with

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[7] 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).

[8] 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)

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 chapter.

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 (see Parsons & Chann, 2019), how and why different groups of the local population are vulnerable to these effects (see Ribot, 2011), and which options – including mobility – they have to adapt and respond.

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4.4. 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

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(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).

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"[9]. 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 they considered 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 (see Schmidt & Benítez-Sanz, 2013; van Loon & van Lanen, 2013).

4.5. 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[10], 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 (see 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 local 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

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[9] Much used as a wider slogan for water use-related protests in northern and central Chile (Rojas Vilches, 2021).
[10] Though at the moment of writing, there were intentions to develop a new Water Code.

water committees to drill deep wells to tap into subterranean water bodies, further depleting the available resources.

4.6. 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 (see Marino & Ribot, 2012; Parsons & Chann, 2019).

For this reason, the different 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.

4.6.1. 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. 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[11], 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.

4.6.2. Agricultural workers under increasing competition

In Monte Patria, the agricultural industry (including both plantations and packing stations) is the most important employer, meaning that 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[12] 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 (see Heran, 2015). Many respondents commented that

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[11] 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).
[12] 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.

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, see 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.

4.7. 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 (see 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 wide-spread 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, 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 (see Carling & Schewel, 2018; de Haas, 2014; Radel et al., 2018; 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.

4.8. 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 (see 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 Figure 4).

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[13] 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, cleaning, 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

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[13] 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.

is not considered as an adaptation to climate change, but rather to the limited options they see locally for living a dignified life.

4.9. 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; Taylor, 2014) and also, to a lesser extent, with (labour) migration under climate change (see e.g. 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 chapter, 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 (see Parsons & Chann, 2019; Parsons & Østergaard Nielsen, 2020) and the options for adaptation to these effects (see 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 (see 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 (see Boas et al., 2019; Kelley et al., 2021; 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 considered as more important reasons for circular or longer-term mobilities directed outside of the municipality than considerations of climate change (adaptation). In line with Radel et al.'s study 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, own emphasis; 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 (see Carling & Schewel, 2018; de Haas, 2014; Radel et al., 2018; 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 et al., 2021). Mobilities then tend to take place along established pathways that have been formed over time by the multi-fragment livelihood strategies which are already common in many rural contexts, allowing for easy access through long-established networks (Kelley et al., 2021; Porst & Sakdapolrak, 2018; Rockenbauch et al., 2019).

This underlines the interlinkage of practices and representations of mobilities (see 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). 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 et al. 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 agroindustry – thereby reinforcing instead of redistributing uneven resource control (see Mikulewicz, 2021).

4.10. Conclusion

This chapter 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 chapter 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 (labour) 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-migration 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.

Chapter 5

Safe from what? Understanding environmental non-migration in Chilean Patagonia through ontological security and risk perceptions

5. Safe from what? Understanding environmental non-migration in Chilean Patagonia through ontological security and risk perceptions

While Chapter 4 focused on mobilities misleadingly labelled as 'climate migration', Chapter 5 focuses on 'environmental immobilities', here as the rejection of outmigration and resettlement policies by a community living in what is officially considered an uninhabitable area. While the chapter does not explicitly employ the environmental mobilities approach as outlined in Chapters 2 and 3, the understanding of im/mobilities explained there has significantly shaped the analysis presented in this chapter, in particular the conclusion that it is the underlying motives for mobilities that lead to such 'voluntary environmental immobility' in a context of normalised labour and educational mobilities. This chapter has been published as:

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Abstract

Why do communities prefer to stay in place despite potentially dangerous changes in their environment, even when governmental support for outmigration or resettlement is provided? That is the key question this chapter seeks to answer. Voluntary immobility is a burgeoning research topic in environmental change-related migration studies, although the role of local sense-making of perceived risks and migration pressures has received only little attention. In order to examine decisions for non-migration, we argue that we need to consider people's ontological security, or subjective sense of existential safety, which shapes risk perceptions. We apply this to the case of Villa Santa Lucía in Chilean Patagonia, where the local population has rejected relocation policies after the village was severely damaged by a mudslide in December 2017. We show how this rejection is not based on the lack of capabilities to move, but on a fundamentally different risk assessment grounded in locally-specific social representations of nature and human-nature relations. This alternative understanding of environmental risks allows the local population to uphold their sense of ontological security while remaining in Villa Santa Lucía, and renders relocation to avoid exposure to natural hazards futile or even inconsistent with local identities. We conclude that local sense-making of environmental risks is an important component of a more fine-grained understanding of environmental non-migration decisions.

5.1. Introduction

Academic, media and policy debates on climate change-related migration have long focused on the problems of projected displacements. Increasingly, however, migration is more positively recognised by researchers and policy-makers as a strategy to reduce risks, either by moving from 'dangerous' places, or by diversifying family income through the (temporary) migration of household members. As such, it has become regarded as an important alternative to adapting in place (McLeman & Smit 2006; Black, Bennett, et al. 2011; Foresight 2011; Sakdapolrak et al. 2016; Klepp 2017; Adger, Safra de Campos & Mortreux, 2018).

However, the policies promoting outmigration as adaptation to climate change are not always accepted by those they address. Empirical evidence shows that many communities prefer to stay in place despite adverse changes in their environment, even when governmental support for outmigration or resettlement is provided (Adams, 2016; Farbotko & McMichael, 2019; Mortreux & Barnett, 2009). This chapter will delve into the motives why communities may reject such migration-as-adaptation strategies, by examining local interpretations of environmental change-induced migration pressures.

In doing so, this chapter contributes to academic research that has only recently started to engage with the theme of non-migration in the context of climate change (Adams, 2016; Black et al., 2013; Mallick & Schanze, 2020; Wiederkehr, Schröter, Adams, Seppelt & Hermans, 2019; Zickgraf, 2018a, 2019). Theoretical approaches to 'environmental non-migration' have so far focused on migration decision-making, drawing for example on behavioural theory (Adams, 2016; Adams & Kay, 2019) and socio-cultural dimensions of place attachment (Farbotko & McMichael, 2019; Mortreux & Barnett, 2009). Yet, it remains largely unexplored how local populations perceive and make sense of the changes in their environment, and how their perceptions of these changes as new migration pressures might differ from official assessments.

To address this gap, we combine research on environmental non-migration with insights on risk perception from the emotional turn in natural hazards research. We focus particularly on how perceptions of risks and suitable adaptation measures are influenced by the need for maintaining *ontological security*, or the belief in the continuity of one's self-identity and environment which allows for a sense of existential safety (Harries 2008, 2017). We analyse how this sense of safety by a community may be different from scientific and governmental risk assessments. Our main argument is that in order to understand (non-)migration decisions, we need to get a better understanding of people's *perceived risks,* and thus their *perceived need* to migrate or not migrate. We illustrate this with empirical data collected in the village of Villa Santa Lucía in Chilean Patagonia, which in December 2017 was seriously damaged by a mudslide that has been attributed to the effects of climate change. Even though in this rural context mobilities for work and education is common, the local population resists the option to relocate from the village that is considered by the authorities to be at risk of future mudslides.

The remainder of the chapter is structured as follows: We start with a review of the literature on environmental non-migration as well as the socio-cultural and affective dimensions of risk perception. Following a description of the case study and research methodology, we present our analysis of local risk perceptions in Villa Santa Lucía. We outline how these are informed by the need to maintain

ontological security, which shapes the population's resistance to adaptation policies. In the concluding discussion, we reflect on the relevance of ontological security and risk perceptions for environmental (non-)migration scholarship, which impels us to rethink the dichotomy between migration and non-migration.

5.2. Understanding non-migration in the context of environmental changes

The concept of non-migration entered the academic field of environmental migration research first as the involuntary immobility of those who lack the means to move out of harm's way when slow- or rapid-onset disasters strike. The 2011 UK Foresight Report 'Migration and Global Environmental Change' (Ayeb-Karlsson et al., 2018; Foresight, 2011) coined the concept 'trapped population' to describe the involuntarily immobile. This concept is an important correction to the 'sedentary bias' in (environmental) migration research, i.e. the tendency to normalise non-migration (Black et al., 2013; Zickgraf, 2019), due to which academia had long neglected the complexities relating to staying in place in the context of environmental changes.

While thus addressing a long-neglected topic, the concept of 'trapped populations' has also received much criticism. A major point of critique is its limited focus on economic obstacles, disregarding socio-cultural and emotional factors preventing migration and (emergency) mobilities (for a detailed critique, see Ayeb-Karlsson et al.,2018). Furthermore, the focus on involuntary immobility does not resonate with the growing empirical evidence that some populations may not *want* to move away from their homes as a measure of adaptation, despite recognising the negative impacts of climate change on their homes. This 'voluntary immobility' is found in climate-affected areas around the world (Adams, 2016; Ayeb-Karlsson et al., 2018; Mallick & Schanze, 2020; Zickgraf, 2018a), and is central to recent research on low-lying Pacific island states affected by sea level rise (Farbotko, 2018; Farbotko & McMichael, 2019; McNamara & Gibson, 2009; Mortreux & Barnett, 2009). Consequently, several scholars have argued for the need to move beyond the normative terminology of 'trapped populations', and to attend better to the choices and constraints involved in all (non-)migration decision-making (Ayeb-Karlsson et al., 2018; Zickgraf, 2018a).

To study environmental non-migration as a phenomenon broader than the lack of (economic) means, a first approach is often to distinguish between (non-)migration aspirations and capabilities (Mallick & Schanze, 2020; Wiederkehr et al., 2019; Zickgraf, 2018a). This distinction emphasises that "migration first involves a wish to migrate", or not to migrate, "and second, the realisation of this wish" (Carling 2002, p. 5). It thus encompasses both aspirations to migrate and not to migrate (i.e. to stay in place), as well as the ability to fulfil these aspirations. It thereby moves beyond purely outcome-oriented approaches in migration theory that tend to focus only on accomplished acts of migration (Carling & Schewel, 2018).

Aspirations and capabilities are each shaped by both internal and external factors on various scales. In the case of aspirations, these might range from societal norms and values around migration to personal preferences for adventure or security. Factors influencing capabilities may range from the restrictions posed by international migration regimes and societal gender roles to family migration history as well as own economic and social capital (Carling, 2002; Carling & Schewel, 2018; de Haas, 2014). Farbotko

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(2018) for example finds that several Indigenous communities from sea-level rise- affected Pacific Island states aspire to stay on ancestral land for cultural and spiritual reasons, such as being close to ancestral burial grounds and upholding custodial responsibilities, and therefore do not consider outmigration. Conversely, studies applying behavioural theory on non-migration decisions of drought-affected Peruvian farmers have found that it is not solely a lack of aspirations, but in many cases a lack of migration capabilities (e.g. limited economic means or local obligations) that lead to non-migration (Adams, 2016; Adams & Kay, 2019). While both are cases of environmental non-migration, the aspirations-capabilities framework highlights how they differ significantly in the underlying reasons for staying in place.

5.3. Local perspectives on risks and the perceived need to migrate

While a growing body of research thus engages with various types of aspirations and capabilities in the context of environmental non-migration, an element that is rarely explicitly defined or examined in relation to environmental changes is the *perceived need to migrate*. Although it was recognised early on as a central factor for understanding decision-making on (not) migrating in the context of environmental changes (Black & Collyer, 2014; Zickgraf, 2018a), the need to migrate is often simply equated to externally observed environmental changes, such as sea level rise or droughts. One of the few studies aiming to conceptualise non-migration in relation to the aspirations-capabilities framework defines the need to migrate as a function of vulnerability, i.e. a person's risk exposure, sensitivity and adaptive capacity (Wiederkehr et al., 2019). This approach focuses on important external or structural determinants of migration needs but does not provide insights into local sense-making of environmental changes and arising migration pressures.

Yet, as a growing body of research shows, people´s interpretations of environmental changes and their potential effects on local livelihoods are increasingly considered central to studying the impacts of climate change on everyday realities (Arnall & Kothari, 2015; Parsons, 2019), and particularly to (non) migration decision-making:

> "[I]ndividuals and communities *respond* to events and information, things do not just happen *to* people. [… S]ocial responses to climate change are fundamentally mediated by perceptions of the problem and of the benefits and costs of responses, which themselves are contextualised by the larger social milieu. People filter information, shaped by their multiple experiences, values and observations, and respond in ways that reflect their diverse experiences and circumstances. This has a direct impact on people's decision-making processes and therefore needs to be closely considered in assessments of population movement with regard to climate change" (Mortreux & Barnett 2009, p. 111, italics in original).

To understand the perceived need to migrate from the perspective of local populations, we propose the subjective dimension of *risk perception* as a suitable lens. Risk perception has been described by a wide array of authors as an important driver of adaptive behaviour (Arnall & Kothari, 2015; Farbotko & McMichael, 2019; Schewel, 2019; Zickgraf, de Longueville & Ozer, 2016) – but to date, it has rarely been included in research on environmental (non-)migration. A recent exception is an article by

Parsons and Østergaard Nielsen (2020), which approaches the topic through a quantitative approach. Therefore, we turn to literature on disaster risk reduction and climate change adaptation, where the emphasis is increasingly shifting from *objectivised* expert- or government-determined risk assessments to *subjective* risk perceptions of affected communities (Adger, Barnett, Brown, Marshall & O'Brien, 2013; Artur & Hilhorst, 2012). In particular, we focus on insights on the affective and socio-cultural dimensions of risk perceptions (Ayeb-Karlsson et al., 2019; Harries, 2008, 2017; Parsons & Chann, 2019). These, we argue, can deepen our understanding of non-migration decision making to complement the aspirations-capabilities framework.

5.4. Risk perception through the lens of ontological security

Perceptions can be defined as "views and interpretations based on beliefs and understanding" within their specific context of material and immaterial structures (Wolf & Moser, 2011, p. 548). People do not act "in direct response to the aggregated geophysical phenomena by which climate change is measured, but rather [to] local weather events, as they are socially, culturally and economically articulated in place" (Parsons & Chann 2019, p. 2-3). Independent of their actual exactness, perceptions often define environmental stressors more than 'objective' data, and shape local decision-making on coping mechanisms (Harries, 2008; Mortreux & Barnett, 2009; Niles & Mueller, 2016). Consequently, a focus on perceptions calls for a people-centred methodology which allows to understand and interpret individual accounts, particularly through the lived experiences of the everyday (Abbott & Wilson, 2015; Arnall & Kothari, 2015; Artur & Hilhorst, 2012; Ayeb-Karlsson, van der Geest, Ahmed, Huq & Warner, 2016; Kothari & Arnall, 2019; Parsons, 2019).

In this research, we specifically draw on the recent emotional turn in human geography and hazard research, which accommodates a keen interest in ontological security. As Harries notes: "People not only want to *be* safe from natural hazards; they also want to *feel* they are safe" (2017, p. 26, emphasis added; see also Harries, 2008; Harries, McEwen & Wragg, 2018; Hawkins & Maurer 2011). This perspective holds that "the ability to live without threat to familiar assumptions about time, space, identity, and wellbeing is as important to humans as the ability to live without threat to material prosperity, physical safety, and physical health" (Harries 2017, p. 16).

Central to this approach is *ontological security*. Coined by psychologist Laing in 1960, it has been defined as the "confidence that most human beings have in the continuity of their self-identity and in the constancy of the surrounding social and material environments" (Giddens, 1991, p. 92). This confidence is central to human agency as well as to building and maintaining relationships with others. In natural hazards research, ontological security has been applied to study how the anticipation of risk can challenge people's understanding of their physical environment, which diminishes their feeling of ontological security. As Harries argues, this explains the seemingly counter-rational behaviour that communities might be very reluctant to acknowledge or act upon environmental changes (Harries, 2008, 2017; Harries et al. 2018). Appealing to fear to induce adaptive responses therefore is often counterproductive (Warner & Boas, 2019; Wolf & Moser, 2011). Below, we elaborate on three factors important for analysing risk perception through the lens of ontological security: social representations based on socio-cultural contexts, religious contexts and past experiences.

Central to upholding a feeling of ontological security are shared understandings, so-called social representations, of grand concepts like 'nature', 'home' and 'society', which people rely on to make sense of potential risks (Harries, 2017). Shaped by socio-cultural contexts, these representations serve as interpretative frameworks people rely on to interpret their observations of events and changes in their surroundings. This insight into ontological security draws on the socio-cultural theory to risk perception (Douglas & Wildavsky 1983), which claims that communities, with their shared meanings and beliefs, create a context-specific view of the natural environment. This affects which sources of information on risks are trusted (Adger et al., 2013; Salite, 2019), how the generative mechanism behind environmental changes or natural hazards is interpreted (Ayeb-Karlsson et al., 2019), and how people react to them (Harries, 2017; Salite, 2019).

Religion is strongly interlinked with the socio-cultural context, but it is often singled out in risk perception research as providing populations with explanatory mechanisms of natural hazards or environmental changes (Artur & Hilhorst, 2012; Ayeb-Karlsson et al., 2019; Salite, 2019). As Wolf and Moser write, "[b]elief in a higher spiritual being plays an important role in determining whether people believe that human action can influence the climate" (2011, p. 14), how this should be done, and who is to be held responsible.

Lastly, past experiences are an important factor shaping feelings of ontological security. The repeated experience of natural hazards, for example, can over time change social representations of 'nature' and 'authorities' for better or for worse, depending on the impact and management outcome of previous events (Harries, 2017; Harries et al., 2018). With regard to authorities, this is particularly relevant for the reliability of the government as a source of information and the trust in its power to protect their citizens (Artur & Hilhorst, 2012; Ayeb-Karlsson et al., 2019). Thereby, personal and collective past experiences shape perceptions of risks, adequate responses, and responsibilities.

Overall, the work on the affective and the socio-cultural dimensions of risk perception strongly reflects a "cross-cutting tendency that institutions and people alike tend to seek continuity", and thus to maintain their feeling of ontological security, "by explaining natural hazards and climate changes according to pre-existing beliefs, structures, norms and practices" (Artur and Hilhorst 2012, p. 535; see also Ayeb-Karlsson et al., 2019; Harries et al., 2018). Changes tend to be accepted only if people are confident of the continuity of their identity and their wellbeing (Flockhart, 2016). Hence, people's actions and responses tend to reinforce the continuity of (social) life, avoiding wherever possible a disruption of their self-understanding, environment, and world view. This approach to risk perception through the lens of ontological security will be applied to the case study of Villa Santa Lucía introduced in the next section.

5.5. The research

5.5.1. The mudslide in Villa Santa Lucía, Chile

The village of Villa Santa Lucía is located in northern Patagonia, Chile, roughly 1300km south of the capital, Santiago. It is located along the Ruta 7 (the so-called *Carretera Austral*), the single north-south road connection in Patagonia, at a crossroads with a local road leading to the tourist destination Futaleufú and two border crossings to Argentina (see Figure 6). Its geopolitically strategic location led to the construction of a military camp and village at this crossing as the *Carretera Austral* was constructed during the military dictatorship (1973-1990). The village was inaugurated in 1982. Most families first settling in the village were descendants of the early settlers who came to the area between the 1930s and 50s, moving to Villa Santa Lucía from farms and hamlets in the surrounding valleys attracted by the village school and health post.
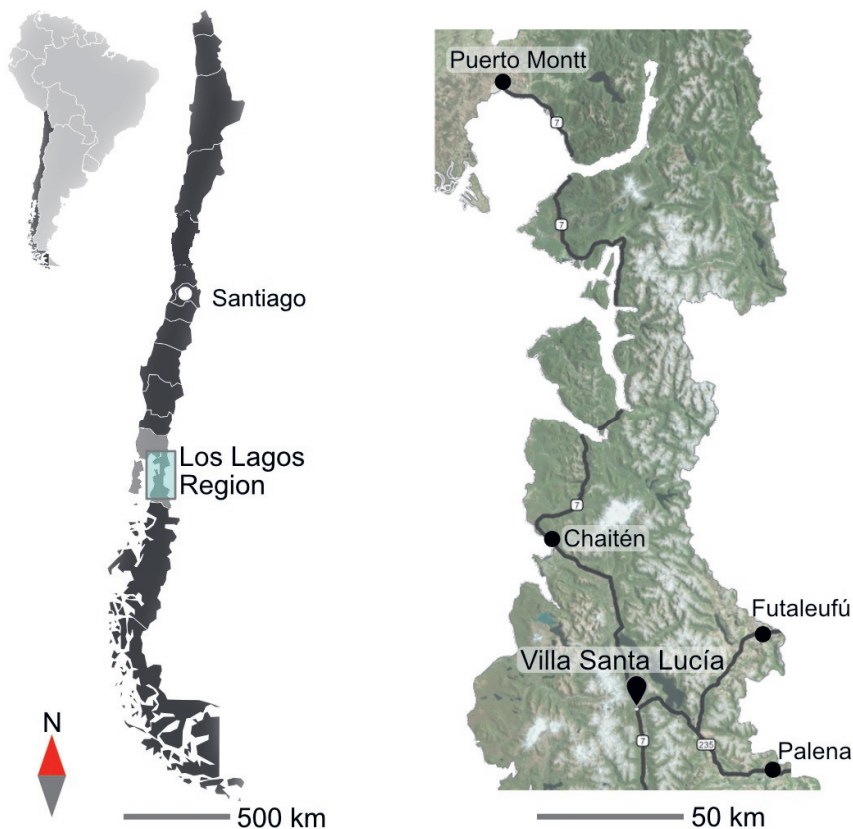
Figure 6. Fieldwork location in Los Lagos Region (Own elaboration based on Microsoft Maps)

The population reached around 200 in 2017, with elderly residents constituting 65% of the total population. Many residents are self-employed, engage in small-scale cattle breeding or forestry activities, and gain their income through temporary government work projects. Stable employment opportunities are scarce, and labour and educational mobility are common especially among the

younger population. From December until March, national and international tourism is a major source of income in the village, which is an important place of transit though lacking tourist attractions of its own.

On Saturday, December 16, 2017, around 9.20am, the village was hit by a mudslide of locally unprecedented magnitude. It destroyed the northern half of the village, holding around 50% of the houses and the majority of stores, tourism facilities and public buildings; 22 persons died and many more were left homeless. The National Service for Geology and Mining (*Servicio Nacional de Geología y Minería*) later concluded that the mudslide was caused by the coinciding of unseasonally heavy precipitation in the preceding two days and a high 0°C isotherm, both of which they associated with the effects of climate change (Sernageomin, 2018). In a context of steep slopes and weak volcanic rocks, the strong rainfall in areas typically only receiving snow caused a rockslide hitting an already weakened glacial layer, which broke off. This created a mudslide with a volume of 7.2million m³ that descended 8.5km into the valley at an estimated speed of up to 72km/h, following the course of a small river. The mudslide reached a maximum height of 20m above river level and buried the northern half of the village under a layer of mud one to five meters deep (Duhart et al., 2019; Mella et al., 2018; Sernageomin, 2018) (see Figure 7).

Figure 7. Aerial view of the extent of the 2017 mudslide (Own elaboration based on Google Earth)

As a first response, the village was immediately evacuated. Most residents found shelter with family or friends in the surrounding towns and villages. Soon after, the National Office for Emergencies (*Oficina Nacional de Emergencia*) declared the village uninhabitable, as it was found to be located in an alluvial plain and thus prone to such events, particularly under conditions of advancing climate change. Consequently, all residents (i.e. those who had lost their homes as well as those who were materially unaffected) were directed to abandon the village through self-organised outmigration. The outmigration was enabled by the provisioning of social housing, which the majority were eligible to apply for. With this being a lengthy process, in the meantime, they received a monthly rent subsidy for two years.

The institutional response to the event was met with fierce opposition from the local population, which eventually prompted a change of policy to relocating the village to flood-proof terrain 400m east of its current location. At the moment of writing, however, the municipality has only acquired the land for a new school, as the steep terrain has complicated the acquisition of more land. Independent of the village relocation, the Ministry of Public Works is pushing plans for rerouting the *Carretera Austral* through flood-proof terrain, potentially leaving the village in the future without direct access to transit tourism as a source of income.

5.5.2. Research methods

Fieldwork in Villa Santa Lucía was conducted between January and March 2020 by the first author of this chapter. Given the potentially traumatic experiences of the respondents (n=26), rather than conducting formal interviews, we chose a more conversational approach focusing on trust-building and repeated interactions over the course of the fieldwork. Due to the sensitivity of the research topic, snowball sampling, based on introductions by earlier respondents, was the preferred sampling method. While both current residents of the village and those who moved to the municipal capital of Chaitén after losing their houses in the mudslide were approached, this chapter draws predominantly on conversations with current residents and their perspectives on outmigration policies. Respondents were sampled purposefully to represent a wide array of perspectives (differing in age, gender, location of house in the village, direct experience of mudslide or not). Of the 26 respondents, 70% were female[14], and the age groups 20-40, 41-60 and 60+ were equally represented. The mudslide had destroyed or seriously damaged the houses of 19 (73%) research participants, and 17 (65%) research participants still remained in Villa Santa Lucía. The respondents engaged in various professions and diversified income strategies; household income was gained from pensions, professional work, forestry activities, temporary state-funded work programs, and as owners of, or employees in, tourism facilities. The majority are considered as poor according to Chilean standards, which enabled them to apply for social housing after the mudslide. However, many respondents also own large tracts of land in the surrounding areas, which shows that statistical indicators do not necessarily fully reflect their socio-economic status.

For a clearer understanding of the authorities' perspective on the case, an additional ten semi-structured interviews were conducted with government officials, working in a variety of departments

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[14] Due to the gendered distribution of work, women were more accessible to the female researcher as they were more prone to stay and/or work within the village during the days, while men tended to spend more time outside of the village for work.

at municipal and provincial levels. This was complemented with two expert interviews to gain an understanding of the events and decisions during the first two years after the event.

The analysis is structured in three parts: First, we focus on the evolving policies promoting migration-as-adaptation, whose rejection by the local population, we argue, cannot be sufficiently explained by a focus on place attachment and material factors, or aspirations and capabilities. In the second section, we analyse social representations of 'nature' in relation to respondents' self-representation to understand local risk perceptions through the lens of ontological security. The third section zooms in on the respondents' strategies for maintaining ontological security by rejecting official risk assessments.

5.6. Rejecting relocation policies

The mudslide that hit Villa Santa Lucía on December 16, 2017, was a traumatic event for the local population, and brought village life to an abrupt halt. Already within a short time after the event, the National Office for Emergencies communicated that the village was at risk of future mudslides and should therefore be abandoned permanently. From the start, however, the policies of emergency evacuation and subsequent self-organised outmigration were met with strong opposition by the population from the materially unaffected southern half of the village. The earliest residents opposing evacuation orders returned to the village at the end of January 2018, not seeing the need to abandon their homes any longer. Most residents whose houses had not been destroyed in the mudslide had returned to Villa Santa Lucía by July 2018, without plans of leaving the village. The majority of those who lost their houses in the mudslide moved to Chaitén, some also to Futaleufú, Palena and the villages south of Villa Santa Lucía (see Figure 6). In early 2020, the permanent population of the village varied between 80 and 100 persons.

Around one year after the December 2017 mudslide, it had become clear that the initial plan of enabling self-organised outmigration of the remaining population of Villa Santa Lucía through the provisioning of social housing was locally not accepted. Officials reckoned that this rejection was due to strong place attachment and social networks among the remaining village population. Adapting to this rejection, the policy shifted from outmigration to a relocation of the village centre to flood-proof terrain ca. 400m east of its current location. The new centre would consist of public buildings, such as a village school, health post and municipal office, as well as social housing for the current residents. This new policy, the authorities considered, would allow the villagers to maintain their social networks and place attachment.

However, even before its implementation, also this adapted plan was rejected by the local population. Due to the planned provisioning of social housing, which most of the remaining village population were eligible to apply for, it was not a question of lacking capabilities or resources for this village relocation. While for several villagers relocating to social housing would be financially disadvantageous (their current houses in the village being more valuable than the State-provided ones), this alternative would allow them to move away from the alluvial plain to avoid future disastrous repetitions of the December 2017 mudslide. The local rejection of this relocation policy, adapted to safeguard the villagers' social networks and place attachment, left several interviewed government officials puzzled. As one asked

during the interview: "How can we make them understand that they have to move?" (interview province-level official 03/03/2020 in Chaitén). The way to approach the local resistance to outmigration policies, we argue, can be found in gaining a deeper understanding of how the residents of Villa Santa Lucía make sense of the December 2017 mudslide and of possible future risks. In the following section, we focus on two elements shaping local identities and self-understanding in relation to nature.

5.7. Understandings of 'nature' and 'self' shaping local risk perceptions

While recognising the extraordinary volume and timing of the December 2017 mudslide, mudslides in themselves are not considered exceptional in this area. As all respondents emphasised during the conversations, landslides and river flooding are common in the area of Villa Santa Lucía, particularly in winter when they frequently block roads and isolate the village for a several days. Even some of those who lost homes and family members in the mudslide did not emphasise the event itself, but rather the protracted and conflict-ridden recovery period as the 'real' disaster.

Such remarks reflect how the population of Villa Santa Lucía has accepted Chile in general, and Patagonia in particular, to be an 'extreme zone' inherently prone to volcano eruptions, earthquakes, floods and landslides. The common social representation of 'nature' in this northern Patagonian context is characterised by unpredictability and hazardousness. Consequently, the December 2017 mudslide was not considered as adding a novel threat to their lives in Villa Santa Lucía – also for a lack of safe alternatives. Frequently, the interviewer's inquiries as to whether the respondents had considered moving 'out of harm's way' were met with the rhetorical question: "Which place in Chile is safe?". According to this widely shared social representation of 'nature' as inherently hazardous, outmigration or village relocation is not considered an effective strategy for mitigating the risks of natural events.

This social representation of 'nature' also relates to the historical roots of the population of Villa Santa Lucía, which influence the local understanding of human-nature relationships. Most research participants are direct descendants of *colonos*, the settlers who arrived at the area from central Chile or abroad between the 1930s and 1950s. Although some *colono* families received large tracts of land from the government, they often lived in poor circumstances and worked on their own land under rough environmental conditions to sustain themselves. This was amplified by the large distance from the centralised Chilean government, which among the population has caused a general feeling of abandonment by the State that still persists today (Rodríguez Torrent & Sáenz Passaron, 2017). These historical roots were referred to by many research participants, several of whom shared their memories of life in isolated hamlets before the foundation of the village in 1982. Character traits such as autonomy, versatility, self-sufficiency and resilience were described as necessary for living in, and mastering, the harsh environment of northern Patagonia – then as now.

The *colono* background as well as the social representations of 'nature' are important factors shaping the interpretative framework (Harries 2017) through which the villagers make sense of the December 2017 mudslide and acceptable responses, and on which their feeling on ontological security is constructed. According to this widely shared perspective, nature is inherently hazardous and

unpredictable, but as long-term residents and descendants of *colonos* the residents of Villa Santa Lucía have acquired the necessary skills and character traits needed to live in this area. From this perspective, the December 2017 mudslide did not create a perceived need to migrate among the population. This was even more strongly expressed by several male respondents of *colono* descent, who particularly emphasised their settler identities and described themselves as accustomed and well-equipped to manage this rough natural environment, disparaging those neighbours they considered as having become "too soft" or "comfortable" to live in this area (conversations with two current residents of the village, both male, 41-60 years). For these research participants, permanently leaving Villa Santa Lucía would be not only futile, but would in fact constitute a retreat from the dangers of nature, which is not compatible with their self-understanding.

In the following section, we focus on several strategies through which the local population maintains these interpretations of environmental risk as well as their feeling of ontological security in Villa Santa Lucía, despite of the official discourse regarding the village as uninhabitable.

5.8. Maintaining ontological security

An ontological security approach to risk perceptions rests on the basic premise that the perception of safety from natural hazards can be more important than factual safety in inducing adaptive behaviour (Harries, 2008, 2017; Harries et al., 2018; Hawkins & Maurer, 2011). In the context of Villa Santa Lucía, where the residents are confronted with a discourse of danger and policies promoting the abandonment of the current village, research participants (inadvertently) resort to three 'strategies' of evading and contradicting the official risk assessment that allow them to maintain their feeling of ontological security: 1) dismissing the official narratives, 2) emphasising distrust in official sources of information and 3) proposing alternative explanatory mechanisms grounded in place identities and religion. Below we discuss in turn how these provide the respondents with justifications for continuing their lives in the village (relatively) untroubled by fears of future mudslides.

1) Evading official risk narratives

During the first two years after the event, many residents refrained from attending meetings with authorities who emphasised the continued danger of mudslides and the need for relocation. In retrospect, these meetings were generally described as highly unpopular and even "useless", as they were "not leading to any outcomes" the local population could agree with (conversations with various residents currently living in the village). It was also reported that external experts, such as a government-sent mental healthcare team, were initially suspected of promoting the outmigration and therefore were at first unpopular with part of the village population.

Many residents thus 'voted with their feet' by non-attendance, discrediting outsider experts, or ignoring narratives conflicting with their own sense-making of the December 2017 mudslide. As one research participant living in Villa Santa Lucía (female, 20-40 years) succinctly expressed it: "making us afraid of the place is doing more damage to our mental health" than past or any future mudslide could do. This demonstrates an intuitive understanding of how the anticipation of risk can negatively impact the feeling of ontological security (Harries, 2008, 2017).

2) Discrediting official risk assessments

A second common argumentative strategy for maintaining ontological security consisted of challenging the trustworthiness of the official risk assessments and the policies of village relocation. Experience with previous natural hazards, particularly with how government institutions communicated and managed risks in these occasions, were emphasised in many conversations as reasons for distrusting authorities as reliable sources of information on risks. Most respondents referred to a 2008 volcano eruption 80km north of the village to justify their doubts whether Villa Santa Lucía was indeed permanently unsafe and uninhabitable: the eruption led to the partial destruction of the municipal capital of Chaitén (see Figure 6), which was then declared uninhabitable and was planned to be relocated. This relocation, however, was never implemented and after two years the town was declared habitable again. This experience of ambiguity and inconsistency in the management of a previous disaster had a lasting negative impact on the locally shared social representation of authorities as competent and trustworthy disaster managers. This was expressed by some research participants as open criticism, by others more subtly as doubts about the accuracy of official risk assessments and explains the local reluctance to act on them.

This lack of trust in outmigration policies was reinforced by some internal contradictions in the authorities' response to the December 2017 mudslide. Several decisions were not in line with the official discourse of continued danger from mudslides, which undermined the effectiveness of risk communication. For example, although Villa Santa Lucía is, at the time of writing, considered uninhabitable by the authorities and public spending is prohibited, for various political reasons the village has never been officially declared uninhabitable. This means that, although public spending is limited, private investment and construction are still possible. Some residents interpreted the policy of treating the village as uninhabitable without an official declaration as an unjustified cut of public expenditure. Others considered it as a valid reason to believe that the village would soon be officially declared habitable again, as was the case with Chaitén two years after the volcano eruption.

3) Alternative interpretations of local risks and suitable responses

Respondents also resorted to different justifications to explain why they themselves did not perceive a risk of similar events in the future. Firstly, all respondents believed that the December 2017 mudslide actually diminished the probability of such events happening again because it changed the landscape, reducing the river flow and vegetation cover. This was reflected in frequently used phrases such as "now that it happened, it won't happen again" or "the worst has already happened, now there is no need to move away". To support their assessment, several respondents also referred to their own extensive knowledge of the local environment, grounded in their long experience of living in and moving through the rough terrain.

Secondly, the timescale employed in the respondents' risk assessments differed significantly from the official discourse (see e.g. Arnall & Kothari 2015): several respondents disapproved of the vagueness in the risk assessments by external experts, criticising them for their inability to tell them if such an event would happen again in "one, ten, fifty or a hundred years" (conversation with female respondent, 60+ years, currently living in village). External experts and authorities' long-term and rather abstract understanding of risk did not resonate with the respondents, who prioritised short-term risk assessments in their interpretations of the mudslide and their perspective on the future of

the village. The uncertainty about the timescale strengthened the opinion among respondents that drastic risk adaptation measures, such as abandoning their village, were unwarranted.

Thirdly, perceptions of future risks were also impacted by the strongly religious context of Villa Santa Lucía, particularly the evangelical community. Two distinct ways in which religion was applied as an argument for staying in the village were found: The majority of respondents ascribed the mudslide, and especially the chance of it happening again, to God's will. Corresponding to the findings of Artur and Hilhorst (2012) and Ayeb-Karlsson et al. (2019), this reliance on higher power(s) leaves humans both with reduced agency and responsibility. The local residents holding this view argued that they could only "wait and see" (conversation with female respondent 20-40 years, currently living in village) what would happen in the future, which renders preventive outmigration ineffectual to them. Other families attributed not the mudslide itself, but their own survival to God's will, and concluded from it their obligation to remain in Villa Santa Lucía as a testament to God's power. Both explanatory structures based on religion thus contradict the official risk assessment and promote stability and continuity in place (see Artur & Hilhorst, 2012).

In summary, we conclude that respondents generally did not consider mudslides as exceptional or dangerous, based on interpretative frameworks shaped by shared representations of 'nature', 'self' and *colono* heritage. Official risk assessments emphasising the danger of a repeated event of similar magnitude were avoided, contested, and distrusted. The alternative interpretations of local risk and suitable responses contain the continuity of village life as previously known as a central element. By resorting to pre-established interpretative frameworks to make sense of changes in their environment, these three strategies provide the respondents with tools for discrediting, in their perspective, the validity of the discourse of danger, tallying with a desire to uphold their sense of ontological security in Villa Santa Lucía.

For now, Villa Santa Lucía remains in a legal limbo. The resettlement plans are not advancing as envisioned by government officials, yet the municipality is also limited in its means for necessary public investments in the current village due to its status of uninhabitability. Nevertheless, the local population is convinced that Villa Santa Lucía will remain where it is, and that eventually the reconstruction of its earlier village character will be possible. The development of nature-based tourism attractions, currently in the planning stage, can be considered as an indicator of this conviction.

5.9. Discussion

With this chapter we have aimed to contribute to academic debates on why local communities do not move away from environmental pressures in the context of a changing climate. We have argued that understanding local perceptions of environmental risks and migration pressures through the lens of ontological security is a promising approach to understand non-migration behaviour, complementary to the aspirations and capabilities model established in the literature on environmental non-migration (Carling, 2002; Carling & Schewel, 2018; de Haas, 2014).

Community resistance to external messages of existential environmental threats is not novel to academic literature (Artur & Hilhorst, 2012; Ayeb-Karlsson et al., 2019; Harries, 2008, 2017).

Contributing to this body of work, our case study of Villa Santa Lucía has shown that the local resistance to outmigration and village relocation policies is neither irrational, purely economically motivated or nostalgic behaviour, but grounded in complex and profound considerations of maintaining people´s identity and relationships with their natural environment. Accordingly, local interpretations of the December 2017 mudslide and risk perceptions render leaving Villa Santa Lucía unnecessary. To the local population – in contrast to experts and authorities – the risk of another mudslide simply does not constitute a 'migration pressure' warranting the abandonment of their village.

These findings have important implications for both environmental migration and non-migration studies: Firstly, this study has demonstrated that for understanding (non-)migration decisions in response to environmental risks, it is promising to broaden the analysis beyond mobility-related factors (such as economic or policy limitations to moving) by considering local realities and people's self-identity in relation to their natural environment. The lens of ontological security, in relation to perceptions of risks and 'migration pressures', can thereby complement and deepen the analysis of migration capabilities and aspirations that has in recent years become established in environmental non-migration research (Harries, 2008; Harries et al., 2018; Hawkins & Maurer, 2011; Mallick & Schanze, 2020; Wiederkehr et al., 2019). In the present case, this approach has helped to explain why the local population has rejected not only the initial outmigration policy, offering social housing and temporary rent subsidies, but also the subsequent relocation policy that ostensibly accounted for local aspirations of maintaining social networks and place attachment. Our results are in line with Salite's recent finding that people's reliance on beliefs in making sense of their surroundings "precedes fact in risk perception, and risks may therefore be dismissed if they do not fit cultural values and beliefs" (2019, p. 428). This focus on local risk perceptions, borrowed from natural hazards research, can thereby deepen our understanding of the complexities involved in (non-)migration decision-making (Mortreux & Barnett 2009; Farbotko & McMichael 2019; Parsons & Østergaard Nielsen 2020).

However, in Villa Santa Lucía, rejecting outmigration and relocation policies on the basis of local identities and interpretations of nature does not necessarily imply a return to an immobile village life. Instead, the village community, particularly the younger generation, continues to engage in frequent and long-established labour and educational mobilities that are an integral part of living in this peripheral area with education and employment opportunities few and far between. The community's strong local commitment to staying in place in a context of normalised mobilities, despite potentially hazardous environmental changes, echoes what Farbotko, Stratford & Lazrus have termed a "sedimentation of sedentarist feelings" (2016, p. 535) in their work on the non-migration preferences among habitually mobile residents of sea-level rise-affected Pacific Island states.

This commitment to non-migration in a mobile context, we argue, challenges the dichotomic understanding of migration and non-migration. While households and communities might engage in what we consider as environmental non-migration, they should not be regarded as immobile *per se*. Rather than a general preference for non-migration, the lens of ontological security foregrounds that in the case of Villa Santa Lucía the *reason* for migration and its coherence with local customs, values and identities is crucial to understanding the rejection of outmigration and relocation policies. Certain environmental risks, such as mudslides, are rejected as reasons to migrate, or even just to relocate several hundred meters – while at the same time routine labour and educational migration are considered normal, necessary and even positive mobilities in the isolated village (Farbotko & Lazrus 2012).

Understanding this seemingly paradoxical rejection of migration policies in a mobile context speaks to recent calls for complexifying our understanding of environmental im/mobilities (Baldwin & Bettini, 2017; Boas et al., 2019; Parsons, 2019). The effects of environmental change on migration decisions need to be embedded in identities and livelihood patterns shaped by historical and present dynamics beyond the case study level. As this chapter has shown, the micro-scale analysis of non-migration decisions is a productive application. Such analyses allow for a more fine-grained understanding of context-specific local identities and relationships to the natural environment (see also Kothari and Arnall, 2019; Parsons, 2019; Parsons and Chann, 2019). We thereby support a more nuanced understanding of environmental migration and non-migration and argue that the ontological security perspective presented in this chapter can guide future studies to better account for the complex, multifaceted and sometimes seemingly contradictory mobility practices that people engage in.

5.10. Conclusion

This chapter has explored the question why some communities prefer to stay in place despite potentially dangerous changes in their environment, even when governmental support for outmigration or resettlement is provided. By combining research on environmental non-migration with scholarship on emotions in risk perception and natural hazards research, this chapter emphasises the importance of local perspectives on environmental risks to understanding non-migration decisions in the context of a changing climate. As we have illustrated by the case of the mudslide-affected village of Villa Santa Lucía in Chilean Patagonia, the residents' rejection of outmigration policies is shaped by the need to maintain ontological security, grounded in social representations of nature and human-nature relationships. Outmigration or village relocation for mitigating exposure to environmental risks are thus rejected, while at the same time labour and educational mobilities are common in this context. These insights can serve as guidelines for developing climate change-adaptation policies involving outmigration and/or relocation that better account for the subjective dimension of risk perception.

Chapter 6

Displacement induced by
climate change adaptation:
The case of 'climate buffer'
infrastructure

6. Displacement induced by climate change adaptation: The case of 'climate buffer' infrastructure

Chapter 6 continues with the theme of contested top-down community relocation in the name of climate change adaptation as introduced in Chapter 5, in this case however as a direct or indirect consequence of flood adaptation infrastructure interventions. Zooming out from the Chilean case studies, this chapter broadens the scope of how human mobilities and climate change (adaptation) are considered as interlinked in this thesis, and contributes particularly to researching the role of governance in shaping environmental im/mobilities. This chapter was previously published, and has been adapted for inclusion in this thesis by giving questions of displacement, im/mobility, and mobility justice greater attention without changing the main argument of the original article.

Abstract

'Climate buffer' infrastructure is on the rise as a promising 'green' climate adaptation strategy. More often than not, such infrastructure building is legitimised as an urgent technical intervention—while less attention is paid to the distribution of costs and benefits among the affected population. However, as this chapter shows, adaptation interventions may have direct or indirect mobility outcomes, resulting for example in the displacement of households or communities, with different levels of participation and compensation. This increases vulnerabilities for some while intending to reduce long-term climate vulnerabilities for all. We argue that this raises serious, if underappreciated, ethical issues that need to be more explicitly addressed in adaptation policy making. We illustrate our argument with the help of various examples of infrastructural 'climate buffers': Two 'Room for the River' projects in the Netherlands, the Diamer-Bhasha dam in Pakistan and the coastal protection plan in Jakarta, Indonesia.

6

6.1. Introduction

In response to increasing worries about global warming, 'green' solutions for climate adaptation have become 'hot'. A growing realisation that climate risks result from an interplay between nature and society has promoted systemic approaches that are inspired and supported by nature. For example, the Sendai Framework for Disaster Risk Reduction (2015–2030) explicitly made the environmental sustainability of interventions a priority (Sebesvari et al., 2019). Recent years have seen a drive in many countries to 'green' and 'climatise' hydrologic (flood and drought) disaster risk reduction strategies under the banner of a lexical field of buzzwords like nature-based solutions, ecosystem-based disaster risk reduction, the water-energy-food-climate nexus, climate proofing, climate resilience, building with nature as well as green infrastructure (the latter defined as "a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services", European Commission, 2013, p. 3). Enthusiastically embraced by many in the policy and NGO communities (Sebesvari et al., 2019), such approaches bring the promise of combining healthier, more sustainable living with climate adaptation and sustainable disaster risk reduction.

The scope of such interventions has steadily increased. Salt marshes, mangroves, sand dunes and coral reefs are customarily understood as natural climate buffers, and their function has come to be revived by the decommissioning of dams, embankments and polders—so-called 'depoldering' ('returning land to the sea') (Crow-Miller, Webber & Molle, 2017; Dekker & Fantini, 2020; Del Bene, Scheidel & Temper, 2018; Dolšak & Prakash, 2018; van Staveren, Warner, van Tatenhove & Wester, 2014) – and the restoration of green landscape elements. Other nature-based solutions combine such 'soft' interventions with 'harder' engineering, as in 'building with nature' (Sinnett, Jerome, Burgess, Smith & Mortlock, 2017). This has also involved the repurposing or relabelling of existing infrastructure as 'climate-smart' or 'climate-resilient', as well as the construction of new 'green' (or ecological) infrastructure. After a period of smaller 'living with floods' and wetland conservation projects, bigger infrastructural modernisation projects are now being built to protect against flood and drought extremes expected to become more frequent with advancing climate change (Leitner, Colven & Sheppard, 2017). Their rationale, we argue, is often boosted by a powerful national or regional development drive to pay for or benefit from the investment. The present contribution primarily focuses on such new, engineered infrastructure or land-use interventions presented as 'climate buffering'.

As Triyanti and Chu (2018) have noted, these 'green' approaches to climate adaptation tend to be focused on "scientific projections, engineering techniques, and their respective roles in shaping economic benefits" (p. 11), while often negating the politics of their governance. They tend to rely on "idealised elaborations of accountability, legitimacy, and adaptability" (p. 18), which may be due to the (thus far) low involvement of social and political scientists in the domain. A common assumption of such initiatives is that enhanced environmental sustainability implies enhanced social sustainability (including health, wellbeing and 'liveability'). This assumption is certainly not bulletproof, as growing evidence shows that climate change adaptation interventions can increase the vulnerability of already marginalised groups (Eriksen et al., 2021; Klepp & Chavez-Rodriguez, 2018; Marino & Ribot, 2012).

Thus, while different forms of public and public–private adaptation interventions are commonly legitimised by highlighting their importance in flood protection, they can also bring considerable trade-offs (van Voorst & Hellman, 2015): while expected to reduce future environmental vulnerabilities for all over time, climate adaptation interventions can significantly increase existing vulnerabilities for some, shift or outsource these vulnerabilities or create new vulnerabilities (Eriksen et al., 2021). Essentially, the imperative of climate interventions tends to call on some citizens to sacrifice the local for the greater good of 'urgent' and 'necessary' climate adaptation.

This raises issues of justice and (climate) ethics. Climate ethics often focus on the distribution of costs between present and future generations, or between those of the biggest emitters and the most affected (Gardiner, 2006; Sheller, 2018b), but the present chapter calls attention to contemporaneous discrepancies within populations. In implementing infrastructural climate change adaptation interventions, security or risk trade-offs can be anticipated between communities that are expected to 'sacrifice' their wellbeing and those that stand to benefit. These bring glaring tensions between the security of some and the security of all, or short-term vs. long-term sacrifice, and can show up the limits to solidarity.

This chapter zooms in on cases where climate-driven interventions involve one such sacrifice: the short- and long-term displacement of some communities to accommodate climate interventions 'for the greater good'. As we will show, programs to make space for climate infrastructure may directly or indirectly induce the evacuation and/or resettlement of households or communities. This focus gives a fresh twist to the ongoing debates on migration and mobilities in the context of a changing climate, which has received considerable attention over the last decades. 'Climate migration' has both been considered as a sign of resourceful human adaptability and as a human tragedy through the discourse of climate refugees (for an overview, see e.g. Bettini & Andersson, 2014; Boas & Wiegel, 2021a; Klepp, 2017). While recent approaches aim at developing more grounded accounts of the relationship between climate change and human mobilities, sensitive also to their political dimension (see Klepp, 2017), displacement and relocation induced by interventions for climate change adaptation tend to be overlooked in these debates (de Sherbinin et al., 2011).

6

We illustrate our argument with three brief case studies of infrastructural 'climate buffers'. As the examples in this contribution illustrate, 'climate buffers' can range from relatively small multifunctional detention basins to mega dams, presented by the World Bank as necessary tools for 'climate-proofing' (World Bank, 2016). As our cases show, these buffers may incite different degrees of displacement for the local populations. After defining climate change adaptation-induced displacement, illustrated by three examples of climate buffers in the Netherlands, Pakistan and Indonesia, our contribution discusses the ethical implications of such displacement. We find that, despite their varying political economy contexts, displacement ethics are relevant in each of these.

6.2. Conceptual framework

6.2.1. The 'anti-politics machine' of climate change adaptation

We are witnessing an unprecedented 'climatisation' (Oels, 2012) of security and development issues, and many have come to refer to climate change only in terms of crisis or 'climate emergency' (Sobczyk, 2019). Climate change and its potential consequences are 'securitised' (Buzan, Wæver & de Wilde, 1998), as an urgent life-and-death threat, lifting them above politics and legitimising extraordinary measures to save the planet. The crisis label incites a strong affect (Figlerowicz, 2012) of existential fear—it keeps people awake at night. This fear makes climate concerns override everything else; the consequences of climate-change intervention seem apolitical. As we shall illustrate, the framing and labelling of places and issues as threats, imbuing them urgency and danger (Buzan et al., 1998), makes climate adaptation interventions difficult to challenge; since the referent object to be protected is not a community or nation, but humanity itself, it is implied that everyone will have to show solidarity.

The normative aspect of the distribution of sacrifices to make climate interventions happen is further obscured by the way infrastructure tends to be decided upon. Writing in a development context, Li (2007) has influentially called attention to the trap of knowledge-based institutions rendering knotty problems technical, reducing complex problems and framing solutions such that they are amenable to technical fixes and devoid of dissent. It implies that such interventions should be left to the experts (Mason & Rigg, 2019; Meissner, 2020). This ostensibly takes the politics – the competition for who gets what, where, why, how and when – out of such planning, thereby 'depoliticising' and bureaucratising questions of resource allocation in a process Ferguson (1994) has labelled the 'anti-politics machine' (see also Eriksen et al., 2021).

Li's (2007) 'rendering technical', observed in the development context, appears to be similarly applicable to climate solutions. While development projects are legitimised by the advancement of a population and lifting it out of poverty, climate and (re)greening infrastructure projects seek to protect a population from the expected negative impact of climate change. By framing 'green' infrastructure interventions first and foremost as necessary adaptation to climatic threats (and attaching a deadline to add to the sense of urgency), these interventions are supposed to be apolitical.

This technical discourse, however, has received much criticism from critical climate adaptation studies over the past years (see e.g. Eriksen et al., 2015, 2021; Klepp & Chavez-Rodriguez, 2018). For example, it has been highlighted that climate change adaptation interventions executed under the imperative of urgent action may "have their own, even-less-understood, stratifying outcomes for vulnerable populations" (Marino & Ribot, 2012, p. 323). Climate change response measures and interventions may also be "producing new injuries in the name of mitigation and adaptation" (Marino & Ribot, 2012, p. 323). Rather than being apolitical, critical scholarship is increasingly emphasising the highly political nature of any adaptation interventions, as these are shaped by and reinforce relational vulnerabilities that "create a stratified human landscape in which the risks and opportunities presented by climatic change are unequally distributed and in which the vulnerability of the marginalised serves as a buttress to the security of others" (Taylor, 2013, p. 319; see also Zoomers, 2010). Eriksen et al. (2021) refer to three impact categories that mar adaptation interventions around the globe: strengthening existing vulnerabilities, offloading them and/or creating new ones. In the flood domain, however, 'green'

infrastructure and other 'soft' flood measures can show a surprising disregard of such social and political impacts, as recent studies have highlighted (Anguelovski et al., 2016; Meissner, 2020).

If insecurities are redistributed disproportionally or offloaded elsewhere in time or space, "(c)limate-change interventions may be 'maladaptive' [to some] and may further 'injure' vulnerable communities" (van Voorst & Hellman, 2015, p. 786). Maladaptation refers to an adaptation action "taken ostensibly to avoid or reduce vulnerability to climate change [which impacts] adversely on, or increases the vulnerability of other systems, sectors or social groups" (Barnett & O'Neill, 2012, p. 9; Triyanti & Chu, 2018). Even if unintended, the external effects, or 'externalities', of such interventions may be evaluated as increasing the vulnerability of some actors. In summary, if "one risk replaces another" (van Voorst & Hellman, 2015, p. 786), the cure might be worse than the ailment; the climate change intervention might be perceived as more harmful than the risk of climate change effects for some stakeholders.

This chapter presents an analysis of the redistribution of actual and perceived security positions as a result of climate interventions, policies or projects among stakeholder groups. Impacts of such interventions can be "classified as gains or losses accruing to different social groups – now and in the future" (World Commission on Dams, 2000, p. 98). This means that while certain actors stand to gain, others lose (materially and/or immaterially) from interventions. Iniquities may arise as a result of interventions in one place to obtain security for others. Interventions can be expected to redistribute the security positions of key stakeholders in a differential way.

This poses ethical questions that are strikingly similar to those asked in the development context several decades ago. Indeed, frequently climate change adaptation interventions are closely linked to development interventions: "[A]daptation is often co-opted to support existing development agendas rather than genuinely addressing climate change risks" (Eriksen et al., 2021, p. 8), and existing development programs might be rebranded and 'climatised' to fit the current global urgency (and the availability of funding) for climate change adaptation. Such interventions, ostensibly aiming to kill two birds with one stone, risk sacrificing long-term adaptation for short- to mid-term development objectives, without addressing underlying socioeconomic inequalities that create and enhance climate vulnerabilities in the first place (Eriksen et al., 2021).

6.2.2. Displacement induced by climate change adaptation interventions

'Climate change is redistribution.' (Marino & Ribot, 2012, p. 323).

Just as was the case for development interventions in the 20th century, policies, initiatives and innovations for climate change adaptation can result in the displacement of populations. For example, while it has become a truism that development projects such as hydroelectric dams tend to instigate involuntary displacement (Scudder, 2012), e.g., through resettlement programs, over the past years there is increasing evidence that climate change adaptation and mitigation programs also have similar effects – despite the fact that the UNFCCC, already in its Kyoto Protocol, "commit[s] States parties to minimise adverse economic, social and environmental impacts resulting from the implementation of measures taken to mitigate or adapt to climate change impacts" (OHCHR, 2009, p. 22; see also Marino & Ribot, 2012; Sovacool, Linnér & Goodsite, 2015; van Voorst & Hellman, 2015, Vigil, 2018). Some such

displacements might be the result of large-scale infrastructural interventions, as the cases discussed in the following section will illustrate.

In other cases, displacement might be more indirect, not part of the plan, but still an outcome of large-scale interventions. This form of displacement occurs when the results of policies or actions render it irrational or intolerable for people to continue to live in a home environment (Oliver-Smith, 2010; Penz, Drydyk & Bose, 2011; Vigil, 2018), e.g., through increasing housing costs or the prohibition of land-use patterns local livelihoods depend on. This might at first increase local engagement in circular labour mobilities directed elsewhere but might in the long run lead to long-term outmigration (Wrathall et al., 2014). Furthermore, green infrastructure can bring a 'green gentrification' of previously neglected areas, which can drive up house prices making it impossible for low-income households to pay rent or buy property in such an area (Gould & Lewis, 2016).

We would argue that in relation to climate adaptation interventions, the ethical issue of (direct or indirect) displacement as 'collateral damage' of climate adaptation has not been sufficiently explored. While the link between climate change and migration has been hotly debated in media, policy and scientific arenas over the past decades (Boas et al., 2019; Klepp, 2017; Piguet, 2013) and is already used to justify climate interventions in many regions around the world vulnerable to climate change (Bettini & Andersson, 2014), the discussions have largely ignored the potential for displacement and relocation induced by such policy interventions for climate change adaptation.

An important exception from the context of climate change mitigation is the work Vigil (2018, 2019), who has analysed the mobility-inducing effects of land grabs in the name of mitigation interventions, specifically for biofuel production and forest carbon projects under the REDD+[15] scheme under the United National Framework Convention on Climate Change (UNFCCC). She distinguishes the mobility outcomes of a) direct expulsion and displacement, b) adverse incorporation pushing small-holders into wage labour (which may be considered as multi-stage displacement eventually leading to outmobility) and c) *in situ* displacement, where people lose both their livelihood and the means to move elsewhere as a consequence of the climate mitigation project (Vigil, 2018). How these mechanisms play out in the context of climate change adaptation, and particularly in the case of climate buffer infrastructure, is the focus of the present contribution.

6.2.3. Inscribing vulnerabilities can lead to population displacement

In making our argument, we call attention to labels. Labelling an area as 'climate vulnerable', thereby inscribing vulnerability, can lead to displacement: it contributes to making those spaces into arenas of risk (Rebotier, 2012), overriding local perceptions of risk, needs and aspirations, as well as imposing a 'securitised' narrative on people's sense of place. This makes, for example, flood mapping an essentially political process. Designating flood zones tends to dramatically raise insurance premiums for the buildings in this area, such as the obligatory insurance premiums in newly designated flood risk areas in the USA after 2005 Hurricane Katrina. When the Federal Emergency Management Agency increased the area defined as flood-risk zones, this made for high insurance rates for those who had previously not been obliged to take out flooding insurance previously. With the end of federal subsidies for flood insurance in 2012 (the Biggert–Waters Flood Insurance Reform Act), many house owners

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[15] REDD+ stands for "*R*educing *E*missions from *De*forestation and forest degradation in *D*eveloping countries, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries" (UNFCCC, 2011, p. 12, emphasis added)**.**

suddenly faced barely affordable premium increases that left them at risk of losing their homes (Checker, 2017). Such policy can thus indirectly increase outmigration from the area, as homeowners might have to sell their now-unaffordable houses and move away.

Labelling a place, a community or a geographical area of a city as 'risky' "creates its own outcomes and can have the effect of a self-fulfilling prophecy'' (Marino & Ribot, 2012, p. 326). This means that such designations are performative. For example, there are many examples of urban disaster sites being framed as a social clean-up, leading to the evacuation and relocation of poor people outside the city in what is critically considered as a 'post-disaster land grab' (Lightman, 2020). This process can also be found in cases of infrastructure projects meant to buffer against urban flooding. One example of this is Hatirjheel, a wetland connecting old and new Dhaka, the megacity capital of Bangladesh. It was scattered with unregularised settlements and used as a dumping ground for waste until the implementation of a beautification and climate change-related flood buffer project connecting lakes in uptown Dhaka. The ensuing land acquisition for the creation of an artificial lake, however, has led to the forced eviction of tens of thousands of people previously living informally or semi-informally in the area (Nijhum, Rahaman, Hossain & Islam, 2019). This illustrates how 'green infrastructure', even if developed with intentions of flood protection, can not only result in, but even legitimise displacement.

The examples below illustrate these mechanisms in three specific cases, based on literature review: the Netherlands, Pakistan and Indonesia (see Table 1 for a summary and comparison), with two 'Room for the River' sub-cases for the Netherlands. These will be explained in greater detail in the next section.

	Controlled flooding areas ('Climate Buffers')	Dam	Urban Coastal Island and Sea Wall Project
Example	'Room for the River' projects in the Netherlands, several locations	Diamer-Bhasha dam, Kashmir, Pakistan	Jakarta, Indonesia
Climate adaptation benefit / formal legitimisation	Prevention of flooding of larger urban centres	Provision of hydropower, irrigation and work to the region	Flood protection from Java Sea, creation of freshwater reservoirs, land reclamation
Mechanism of displacement	Relocation, potential short-term evacuation from sacrificial flood areas	Government-led relocation of 32 affected villages to 'model villages'	Relocation to social housing; displacement of marginalised coastal *kampung* dwellers
Compensation	Financial compensation to house owners for buy-outs	Financial compensation considered insufficient, delayed	Relocation to social housing only for residents with housing titles
Protest and result	Citizen mobilisation, project re-evaluation by experts and municipal/provincial governments leading to stop/redesign of several projects	Sit-ins and protests by Diamer-Basher Dam Affectees Action Committee, no modification of project	Citizen protests by affected residents, legal procedures against irregularities in intervention leading to downscaling of project

Table 1. Summary and comparison of 'climate buffer' cases discussed in Chapter 6.

6.3. Contested climate buffers: Three examples

In this section, we elaborate on three different case studies of 'climate buffers'—a dam, controlled flooding areas and an urban coastal island project—to exemplify the argument above. These cases were deliberately chosen from widely differing contexts (Pakistani, Dutch, and Indonesian) and illustrate different mechanisms of direct and indirect displacement. We first introduce the climate buffer projects and their rationale and then analyse how they relate to displacement.

6.3.1. Example 1: Climate buffers in the Netherlands

In the Netherlands, a 'climate buffer' is a concept for detaining water in a multifunctional water retention area with a view to future extreme flooding events. It is a modality of 'Building with Nature', a green technology utilising the natural dynamics of accretion and erosion (Bal & Vleugel, 2014). Climate buffering has its origins in the Dutch World Wildlife Fund chapter's 1992 Living Rivers vision document (Ruimte voor Levende Rivieren, n.d.) to restore side channels and riverbank ecosystems. Such a climate buffer is a *de facto* zoning, space-making measure.

In the 1990s, the Dutch government downscaled the Public Works department, the national flood manager, and partly devolved flood management to local and regional initiatives. This broadened the limited focus on flood defence to an 'integral, area-based economic development' (Room for the River, n.d.). In this vein, the 'Room for the River' projects are a combination of river rehabilitation, flood safety planning, regional economic development and urban regeneration along riversides. Interventions such as these include the displacing or removing levees and the lowering of groynes and floodplains to allow rivers to meander, though only where this does not compromise economic (shipping) interests. The rivers are allowed to flood carefully selected areas when peak discharges test their capacity. Widening the river, e.g. through dike displacement, gives it more discharge capacity without compromising economic value of shipping (Room for the River, n.d.). The cost of such interventions is largely borne by the proceeds from the river itself, through the sale of gravel and sand from the riverbed excavated to deepen or widen the river (Warner, 2010).

A promotional text from the Dutch Natural climate buffers coalition (Klimaatbuffers, n.d.) exults that green buffers can make the Netherlands "more secure, more beautiful and more economically attractive" (p. 1) and claims that "[a]dministrators and local residents are invariably enthusiastic" (p. 2) – but such praise is not unanimous. While 'Room for the River' reintroduced time-honed 'soft' technologies such as controlled flooding and building on mounds (elevations), this was done in a top-down fashion. Although public participation was part of the programme design, this was often left late once the public authorities, landowners and umbrella interest organisations had conducted complex multistakeholder negotiations (Edelenbos, van Buuren, Roth & Winnubst, 2017). As a consequence, those most affected by the programme quite belatedly became aware that the interventions could induce displacement through two mechanisms: buyouts and temporary evacuation. These are exemplified with two cases below.

a. <u>Buyouts and demolition of houses and farmsteads to make 'Room for the River'</u>

Controversy erupted in the early 2000s over a plan to relocate an inland dike by 350m to widen a flood-prone bottleneck in the river Waal close to Lent, Nijmegen, as part of the 'Room for the River' program. In this context, the Spiegelwaal, a 10 m deep, 200 m wide canal was to be dug in the new flood plain

liberated by the dike shift, creating a new buffer island, Veur-Lent, on which a new suburban district was to be developed (Klimaatbuffers, 2021). In total, 100 houses were to be demolished to make space for the project. The necessary resident buyouts constituted a rare case of 'eminent domain' in the Netherlands, giving houseowners an advantageous bargaining position.

Some former residents were reported to have profited significantly by this, so they could afford a better house than before. However, many initially refused to comply with the buyouts until citizen protest ran up to a political barrier. The city of Nijmegen had already signed agreements with the national government, in which Nijmegen was to get compensation for its intended housing plan in the relocation area as well as considerable funding for a bridge across the river Waal to tackle congestion problems with the existing bridge (Edelenbos et al., 2017). Citizen pressure in the city council led to their involvement in a multistakeholder advisory group. The project was eventually implemented in 2011–2015.

b. <u>The temporary evacuation from areas designated for controlled flooding to reduce the peak discharge</u>

'Calamity polders' are low-lying areas surrounded by dikes and situated along the rivers that can be used for emergency water storage. The ancient Dutch custom of assigning polders as calamity polders, that is, sacrificial flood areas to buffer against flood peaks, had fallen out of fashion in the Netherlands in the mid-20th century with the advent of hard river defences (Roth, Warner & Winnubst, 2006). The Ooijpolder, a leafy polder area near the city of Nijmegen bordering Germany, used to be such a calamity polder. In February 2000, the Public Works Department reintroduced the Ooijpolder as a controlled flooding area. In case of a riverine flood peak, the polder would be first in line to be flooded, and the inhabitants of the polder would be expected to evacuate. In case of evacuation, it was projected it would take six months to clean out and restore homes after flood damage. When this plan became known, residents feared that even in non-flood times, their houses would become unsaleable or that the program would put a 'freeze' on new housing developments, assuming that no one would invest in real estate in an area designated as a sacrificial flooding area. A media campaign targeting local, regional, national and international (German) policy arenas led to parliamentary questions and eventually to the shelving of the controlled flooding designation (Roth et al., 2006).

Despite these successful protests, in the late 2010s, history repeated itself when the Lob van Gennep area on the river Maas in the southern province of Limburg was appointed as a climate buffer detention basin: the area would be embanked by a lock dike to be opened in times of extreme high-water discharges, defined as 20% higher than the maximum in recent history. In such an event, some 7000 people would need to evacuate within 48h, leaving their livestock behind, before the lock in the dike would be opened and water would come rushing in at 300 m/s. A local protest group, *Nee tegen de vloedgolf* (in English 'No to the floodwave') loudly resisted the plan, resenting particularly that this potential destruction of their homes was justified as protection of downstream cities Den Bosch and Rotterdam from floods (Eimers, 2020). In 2020, the Gennep plan—like the Ooijpolder plan 15 years earlier—was eventually shelved after a combination of loud protestations and model studies showing the planned intervention to be ineffective (Remmelzwaal & Vroon, 2000; van Hoof, 2020a, 2020b).

Overall, given the prospect of (temporary) displacement looming over people's heads due to the 'Room for the River' projects described above, it is unsurprising that local enthusiasms varied after all,

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and protests ensued that led to the eventual shelving or downscaling of the planned interventions. It is notable that these successful protests were primarily driven by well-connected middle-class citizens who could push back against what they saw as disenfranchisement over issues affecting their living environment and, often, livelihoods. In the other cases discussed below, many affected groups were significantly less successful.

6.3.2. Example 2: Reinventing dams as climate buffers in Pakistan

In the 20th century, large-scale dams were emblematic of modernisation and development, bringing irrigation and electrification and driving food security. However, in the 1990s, these goals lost their lustre in a cloud of corruption and global protests over social and environmental impacts. Furthermore, the work of Scudder (2012) and Del Bene et al. (2018) showed that compensation plans for dam-displaced people rarely worked out well. For these reasons, the tripartite (public, private, NGO) World Commission on Dams report (2000) made strong recommendations for large dam projects (defined as those exceeding 15 m in height), postulating amongst other things that dam-displaced people should be consulted prior to the intervention and properly compensated.

However, since then, dams have made their comeback around the globe, in no small measure legitimised as a 'green' alternative to fossil fuels and as a climate buffer:

> "[Dams are considered as] an adaptive measure regarding the impacts of climate change on water resources, because regulated basins with large reservoir capacities are more resilient to water resource changes, less vulnerable to climate change, and act as a storage buffer against climate change" (Berga, 2016, p. 313).

Climate awareness has increased the popularity of hydropower (Shah, Vos, Veldwisch, Boelens & Duarte-Abadía, 2021; Watts, Richter, Opperman & Bowmer, 2011), hailed as a dependable source of green and renewable energy and eligible for Clean Development funding and carbon credits (Ahlers, Budds, Joshi, Merme & Zwarteveen, 2015). Rather than multilateral financiers such as the World Bank and the Asia Development Bank, the new generation of dams is often backed by regional and national players such as Chinese investors and development funds, as in the present case of Pakistan.

Pakistan, one of the world's most water-stressed countries, currently has around 150 large dams higher than 15m. As Pakistan's economy is highly dependent on irrigation water for food production, river disputes easily become heated national security disputes. In Pakistan, "dams are seen as the best adaptation strategy to meet the challenges of climate change" (Akhter, 2015, p. 745). The Diamer–Bhasha dam, a concrete dam in the wider Kashmir region on the river Indus near the town of Chilas has been planned and repeatedly inaugurated as a hydropower-*cum*-irrigation project for almost 50 years (Cukia, 2021; Philip, 2020), but is now presented by the Pakistan government as a climate buffer (Akhter, 2015). When a crowdfunding campaign for the biggest dam in Pakistan's history largely failed, China stepped in to build the 272m high Diamer–Bhasha dam, and the building contract was finally signed in 2020.

While the gravity dam is supposed to bring electricity, irrigation water and jobs to the area, this project is heavily contested. The dam project, located in the Diamer district of Gilgit province, is set in an area of nationally and internationally disputed territories (Philip, 2020). Furthermore, it is projected to flood 32 villages, displacing some 30,350 people, and to submerge important Buddhist cultural and

archaeological heritage (Sabir, Torre & Magsi, 2017; Sabir & Torre, 2017). The Pakistani government plans to resettle the displacees into new 'model villages', one of which is 80 km away (Hasnain, 2018). As a response, the Diamer–Bhasha Dam Affectees Action Committee has staged sit-ins over the meagre compensation arrangements on offer. It has been reported that some protesters were killed by riot police (Israr, 2019).

Despite the new 'climate change adaptation' label attached to the Diamer–Bhasha dam project, the controversies around the displacement of already marginal communities and the lack of participation and compensation, as well as the political repercussions, are evocative of earlier dam constructions as part of development projects. It shows that whether they are adaptative to climate change or developmental in their objectives does not alter the tendency of such projects to serve larger vested economic interests and to neglect the priorities of local communities (Mirumachi, Sawas & Workman et al., 2020; Shah et al., 2021).

6.3.3. Example 3: Climate-proofing Jakarta

Jakarta, the capital of Indonesia, is a coastal megacity of some 10 million inhabitants, with an estimated 34 million in Greater Jakarta. Forty percent of the city is located below sea level, some areas by over 4m. With advancing climate change, Jakarta is predicted to be threatened by sea level rise and tidal floods, as well as by river floods due to increasing extreme weather events. This is aggravated by the rapid subsidence of 8–25 cm per year parts of the city experience due to groundwater overpumping (van Voorst & Hellman, 2015). Many poorer inhabitants live in informal settlements, so-called *kampung*, along the coastline and rivers. These areas tend to be affected by minor floods every rainy season (Leitner & Sheppard, 2018). Major floods occur on average every five years, with the 2007 floods hitting especially hard, killing 80 and displacing some 500,000 Jakartans (Dartmouth Flood Observatory, 2008). This combination of event and trend has given rise to many doomsday deadlines in the headlines, indicating that "by 2050 about 95% of North Jakarta will be submerged" (Lin & Hidayat, 2018, n.p.), or that authorities have only "[t]wo years to save northern Jakarta" (Sherwell, 2016, n.p.)[16].

As van Voorst and Hellmann (2015) argue, flood adaptation interventions can be considered as "part of a long tradition of city renewal and slum eviction", which are now labelled "greening the city" (p. 805). Even before the destructive 2007 flood, the World Bank had insisted Jakarta should advance its climate policy, and Jakarta's government had repeatedly vowed to make the capital city clean and slum-free. The 2007 flood, however, gave a push to various redevelopment projects seeking to improve flood safety and 'liveability' along the coastline (Sherwell, 2016).

Most iconic among these was the Great Garuda project, which combined a new sea wall closing the bay of Jakarta with the creation of a set of artificial islands and peninsulas in the shape of the mythical Garuda bird, a symbol of Indonesia (Bakker, Kishimoto & Nooy, 2017; Colven, 2017; Leitner et al., 2017). Massive pumps would transfer water from the lagoons to the bay. The sea wall and artificial islands simultaneously would create a huge new urban quarter on reclaimed land. While the main task of this intervention was to buffer Jakarta's north coast from the Java Sea (Doman, Lipson & Wu, 2019), the redeveloped coastal zone would then become home to a new business district, luxury apartments

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[16] For these reasons, the government of Indonesia is currently constructing a new capital, called Nusantara, on the island of Borneo (Beech, 2023). Construction began in 2022, and the first phase is projected to be completed by 2024 (Mokhtar & Rahadiana, 2022).

and hotels. While keeping sea floods out, the sea wall was designed to create lagoons to serve as drainage reservoirs to buffer the outflow of the 13 rivers that flow through Jakarta, creating a freshwater reservoir – despite warnings that the heavily polluted river effluent would only create a cesspit (Colven, 2017; Sherwell, 2016).

The Great Garuda island project was eventually significantly scaled down in 2018 by the new governor of Jakarta in light of its excessive estimated cost (Oktavianti, 2020; Sherwell, 2016) and failures to adhere to procedural requirements; only the outer sea dike project (now renamed 'Giant Sea Wall') and the construction of some smaller islets close to the coastline was continued (Ibnu Aqil, 2020; Oktavianti, 2020). However, despite the later changes to the coastal development plan, many *kampung* dwellers were already displaced to make space for the flood infrastructure (Leitner & Sheppard, 2018). The Socially Inclusive Climate Adaptation for Urban Revitalisation Project (2012–2017) aimed to "relocate close to 400,000 squatters from riverbanks and nearby reservoirs" within, at the behest of the former governor, "a humanised and participative process" (C40 Cities, 2016, p. 12). Those in possession of legally recognised housing titles were moved to social housing facilities far away from the coastline; many others without such documentation had to leave without compensation (Bakker et al., 2017; Leitner & Sheppard, 2018). This displacement deprived the former *kampung* dwellers of their livelihoods, involving informal economic activities such as fishing, seafood harvesting and processing, and of vital socioeconomic networks (Hellman, 2015; Ibnu Aqil, 2020; Padawangi, 2012; Yarina, 2018). For example, in 2016 fisherfolk, some of whom had been forcibly relocated in earlier occasions, rallied in front of the district council building to protest their eviction and relocation to the Thousand Islands regency, which consists of islands located some 50km north of Jakarta (Batu, 2016).

While the eviction of *kampung* dwellers is not unusual in Jakarta, in this case, it is the argument of climate change risk, notably flood risk management, that was advanced to legitimise these actions this time around, rather than urban development. Zero flood risk, however, is not necessarily a priority for everyone exposed to it, and people may have rather different understandings of (climate) risks (Wiegel et al., 2021). "(F)or poor families living on riverbanks in the city centre [and coastal areas] the floods also constitute a necessary condition to create a viable livelihood. [...] For the families living in these areas there is a constant 'trade-off' between safety and risk taking with the purpose to create a living" (Hellman, 2015, p. 468). Many people affected by the Great Garuda (and later Giant Sea Wall) project consider evictions and displacement, rather than floods, as the main risk, as they separate them from necessary social networks offering informal work opportunities as well as social support (Hellman, 2015; van Voorst & Hellman, 2015; Yarina, 2018). As a consequence, the project has received harsh criticism (Bakker et al., 2017; Yarina, 2018) for falling short of both environmental and social procedural standards and for largely playing out on the backs of those already most disadvantaged.

6.4. Discussion and conclusion

This chapter has shown that climate buffers generate enthusiasm not only as 'green' climate adaptation interventions but also as 'green' development projects. We have drawn attention to the direct and indirect displacement effects of climate interventions, ostensibly justified by a climate change adaptation imperative, but often with a strong development drive as its flywheel (see also

Leitner et al., 2017; Taylor, 2014). These interventions aim at developing or upgrading a 'neglected area' for middle-class living and leisure in the Netherlands and Indonesia and boosting national agricultural and industrial development in Pakistan. The anticipated economic (and political) gains from land development can offset the steep cost of environmental projects such that it is not always entirely clear which drives which in 'climate buffer' projects. As this chapter has highlighted, however, the construction of such buffer projects may reap adverse (and potentially self-defeating) environmental, economic and social impacts, including temporary or permanent displacement of some populations.

We have shown how climate adaptation interventions can significantly enhance local vulnerabilities by impeding livelihoods or vital socio-economic networks (Marino & Ribot, 2012). Climate adaptation interventions can induce mobilities that introduce new vulnerabilities, whether by immediately uprooting people, expecting them to evacuate in the future, reducing the value of their assets by 'freezing' investment or pushing them out due to 'green gentrification'. We consider the former as a mechanism direct displacement, as illustrated here with the examples of Lent, the Netherlands, the Diamer-Bhasha Dam, Pakistan, and Jakarta, Indonesia. The latter three are mechanisms of indirect displacement, where people might leave over time, often without compensation, if they come to consider it untenable to remain in place for economic and/or social considerations (Vigil, 2018). This was illustrated here with the examples of the Ooijpolder and the Lob van Gennep area, the Netherlands, and to some extent in Jakarta, Indonesia.

Despite the risk of direct or indirect displacement, some stakeholders may agree to the climate change adaptation projects if they believe these are serving a greater good and that they are equitable, i.e. that their benefits are proportional to their sacrifices. Some *kampung* dwellers in Jakarta, Indonesia, may have welcomed the relocation to social housing outside of flooding areas. In some 'Room for the River' cases the Netherlands, some will have appreciated the compensation they were offered. However, even if they agree to the project, especially poorer stakeholders cannot 'buffer' economically for long if compensation is uncertain or even absent (Warner, van Staveren & van Tatenhove, 2018), as we have seen in the case of the Diamer-Bhasha Dam in Pakistan.

In cases where such interventions are perceived as maladaptive at least to some parts of the affected population, planners can expect to encounter resistance from those expected to 'sacrifice for the greater good' (Taylor, 2013; Zoomers, 2010). As we have shown, however, the scope to influence such climate buffer project decisions through protest differ widely across different contexts. In the Dutch cases, local resistance eventually eroded the legitimacy of the project's rationale and led to various degrees of retreat—from modification of the terms of relocation and compensation, to shelving of the project (Roth & Winnubst, 2014; van Hoof, 2020b). The protagonists in the other two case study sites were not as successful. Despite local protests and international critique, the Garuda Island project resulted in the evacuation and displacement, without compensation, of thousands of those *kampung* dwellers in North Jakarta who lacked official housing permits. The project was eventually downscaled as a top-down budget decision by the new governor of Jakarta (Oktavianti, 2020). The remaining sea wall project has become a cautionary tale for similar endeavours that are already ongoing, such as the New Manila Land reclamation and port reconstruction project in the Philippines (Shannon & Hilterman, 2023). In Pakistan, displaced citizens in dam-affected areas (so far unsuccessfully) protested what they considered woefully inadequate compensation offered for their displacement. The dam construction

6

will likely forge ahead despite these protests and doubts about its potential usefulness (Mirumachi et al., 2020).

Climate change adaptation-induced displacement, then, is an issue where climate and mobility justice considerations converge: Climate justice, often discussed in terms of the inequalities between the biggest polluters and those most affected by the resulting climatic changes (Sheller, 2018b), is also at play when considering the uneven distribution of costs and benefits of climate change adaptation (Bakker et al., 2017; Eriksen et al., 2015; Taylor, 2014). This raises important questions about the rationales of 'climate buffer' projects, and their assumptions about which areas are considered as more expendable than others in case of flooding, and which lives and livelihoods are more worthy of protection. Applying this justice angle to issues of displacement, relocation and involuntary immobilities, for example through mobility justice (see Farbotko, Thornton, Mayrhofer & Hermann, 2022; Sheller, 2018b) "invites us to think critically about how the rights to dwell and the rights to move of those most affected by climate change are protected and addressed [… by climate governance] especially since they often are part of those populations who have least contributed to climate change themselves" (Boas et al., 2022, p. 8).

Such considerations of justice are particularly relevant in cases where interventions legitimised as types of climate change adaptation, such as the flood-related infrastructural adaptation discussed in this chapter, do not reduce, but rather increase existing vulnerabilities, create new ones or redistribute them unevenly within the society (Eriksen et al., 2021). The examples in this chapter have shown that top-down adaptation planning to date is prone to using arguments of necessity and urgency to legitimise contested interventions, and to 'rendering technical' (Li, 2007) of what are essentially political decisions about the allocation of the costs and benefits of climate change adaptation interventions, with significant ethical implications. This happens particularly when climate adaptation interventions are developed "by relatively privileged groups rather than being framed by the intended beneficiaries" (Eriksen et al., 2021, p. 3).

To address such injustices, critical adaptation scholars have long emphasised that "any thoughtful answer must weigh conflicting interests among different people" (Broome, 2008, n.p.). This is particularly relevant when the target audience of (climate) security speech contests such framing, and where those most affected are already among the most marginalised groups, for their lack of housing titles, their minority status or other long-established sociocultural, economic or political factors. There are well-established principles for justice in project-induced displacement in place (Cernea, 1997) that aim at avoiding, or at least minimising, injustices around climate adaptation-induced displacement as described in this chapter. For example, the World Commission on Dams guidelines (2000) stipulate that consultation and compensation of affected communities are of the essence. These and other long-established guidelines, based on the experiences with infrastructural development projects, are important bases for ethical considerations around infrastructural climate change adaptation projects, and should not be disregarded despite the imperative of urgency attached to these new climate change adaptation interventions.

To conclude, then, in this chapter we have discussed injustices around flood adaptation interventions, particularly those where certain groups of people to be asked, told or implied to make sacrifices, temporarily or permanently, for the sake of stakeholders in other locations. This shows that the ethics of climate change adaptation are not only relevant to consider in the relation between current and

future generations, or on a global level between emitters and those affected most by climate change, but also regarding uneven distribution of costs and benefits of climate change adaptation interventions today (Eriksen et al., 2015, 2021; Taylor, 2013, 2014).

To increase climate (mobility) justice in cases of climate change adaptation-induced displacement, we argue that we do not necessarily need new rules; rather, we recommend the proper implementation of the compensation and consultation principles that are already there but in too many cases seem to be a 'dead letter' in practice. Ethical considerations, to be sure, are contextual and never absolute (Groenfeldt, 2021), but a clearer focus on the views and risk perceptions of project-impacted groups, as well as on the uneven distribution of power to influence climate adaptation projects that can lead to displacement, should inform future infrastructural 'climate buffer' projects to avoid steamrolled infrastructure (process) and increased rather than decreased vulnerabilities (outcome).

6

Chapter 7

Conclusion

7. Conclusion

With this thesis, my aim was to open up linear conceptualisations of the relationship between human migration, mobility and climate change, and to interrogate it from a critical and power-sensitive perspective. To do so, I chose the concept of *environmental im/mobilities* as my main entry point of analysis. As this thesis has shown, this approach is particularly insightful for gaining an understanding of how climate change influences people's im/mobilities in their everyday lives. From this perspective, then, the two images that opened the Introduction of this thesis, one heralding 'Chile's first climate migrants' and the other claiming that the droughts resulted from water theft rather than climate change, are each showing only part of the multifaceted, complex and contested climate change-migration nexus.

When I started working on this topic in 2017 as a junior researcher, and then in 2018 as a PhD candidate, the conceptual development of the climate change-migration nexus was at a very different point from where it is today. Tellingly, the working title of the first chapter that I started in 2018 (included here as Chapter 2) was 'Beyond the divide', reflecting the binary character of the dominant discourses on the topic at the time: On the one hand, there was the alarmist 'climate refugee' storyline of desolate – and simultaneously threatening – displacees; on the other hand, there was the migration-as-adaptation narrative that took a more optimistic perspective on 'climate migrants' as adaptive agents, but still focused on migration as an exceptional event.

Already at that time, a small but vocal group of critical scholars were calling for a more nuanced and politicised understanding of the climate change-migration nexus, for example in the 2014 article by Andrew Baldwin that inspired the title of this thesis. An increasing number of grounded accounts of local experiences with climate change and migration highlighted the importance of considering different perceptions about the meaning of these changes in the natural environment, about the need to migrate and the desire to stay in place despite adverse circumstances (e.g. Adams, 2016; Arnall & Kothari, 2015; Farbotko & Lazrus, 2012). At the same time, several publications on the political dimension of the climate change-migration nexus criticised how its embeddedness in uneven structural relations of power was neglected in the debates in favour of a more deterministic understanding of climate change (e.g. Bettini, 2017; Klepp & Herbeck, 2016; Nicholson, 2014; Zetter & Morrissey, 2014). It is from these two research trends that I took inspiration for this PhD project, and based on which I developed the three questions that guided this study:

1. What can an environmental mobilities perspective contribute to the study of the climate change-migration nexus?
2. How do local perceptions of climate change and its related risks shape environmental im/mobilities?
3. How do power relations shape environmental im/mobilities?

In this conclusion chapter, I synthesise the findings of the various – and varied – chapters of this thesis and discuss their relevance in the context of the academic debates on the climate change-migration nexus. The remainder of the chapter is structured as follows: In the next sections, I answer my three research questions, reflect on their implications for the academic debates they are nested in, and how these have evolved over the course of this research project. I will then dive into two main themes that

have emerged from the analytical chapters of this thesis: the question of (analytical) scale in understanding the societal effects of climate change, and reflections on the politics of knowledge production on the climate change-migration nexus through the concept of epistemic justice. I will discuss in relation to the literature how these elements can provide further conceptual and empirical insights into environmental im/mobilities and end this chapter with recommendations for future research.

7.1. Answering the Research Questions

7.1.1. Theorising environmental im/mobilities

The first question guiding this research aimed at exploring the conceptual potential and implications of an environmental mobilities perspective. This perspective is based on the mobilities approach coined by Urry and Sheller (Hannam et al., 2006; Sheller & Urry, 2006; Urry, 2007), applied here to study migration – or rather, mobilities and immobilities – in the context of climatic and environmental changes. Throughout this thesis, the environmental mobilities perspective has served as the underlying inspiration and lens to thinking about the climate change-migration nexus, even in the analytical chapters in which it features less prominently.

As I have shown, this approach can generate grounded insights into the role of im/mobilities in everyday life under climate change. It emphasises on the role of mobilities *already taking place* within and across both urban and rural space (Sheller & Urry, 2006), and how these are always relational to other mobilities and immobilities, both within individual trajectories and across households, communities and larger scales. From this relational approach, the search for causal relations between climate change and migration based on linear understandings, which has long dominated the debates on 'climate migration' (Klepp, 2017; Piguet, 2013), becomes less relevant. Instead, analysing environmental im/mobilities prioritises understanding how systemic shifts, such as climate change, are reflected in these mobilities, changing their form, frequency, routes, and/or difficulty of access (see Cresswell, 2010).

By moving away from an understanding of migration as exceptional, the environmental mobilities approach opens up the empirical focus beyond long-distance, one-off migrations, considering instead a wider range of mobilities (from short- to long-distance, short- to long-term, one-off or repetitive) as well as immobilities as relevant to study in this context. For this thesis, I considered circular labour mobilities (Chapter 4), non-movement as protest (Chapters 5 and 6), as well as displacement and resettlement resulting from, and legitimised as, climate change adaptation (Chapters 5 and 6) as examples of environmental im/mobilities. This broadening of potential research foci contributes to the pluralisation of the climate change-migration nexus, drawing attention to relevant, but long neglected, elements such as the role of the governance of labour mobilities and climate change adaptation.

To study these im/mobilities with particular attention to the specific context in which they play out, the environmental mobilities approach makes an analytical distinction between aspirations and capabilities (Carling, 2002; Carling & Schewel, 2018; de Haas, 2014; de Sherbinin et al., 2022). It starts from the assumption that people have different aspirations regarding their relative mobilities and immobilities, and uneven capabilities for fulfilling these aspirations. This analytical distinction allows

to capture a great variety of nuance and diversity of mobilities, and their meaning, in the context of a changing climate: In some cases, the (temporary) labour mobility of some family members can enable the household to stay in place when traditional agricultural livelihood patterns change, but at the same time exactly this stability and continuity is necessary to allow for labour mobilities of other household members in transgenerational households (Chapter 4). In other cases, mobility for work or educational purposes might be normalised and even considered positive, while at the same time mobility for evading environmental hazards might be rejected (Chapter 5). Relative immobility may be caused by a lack of options in some contexts, while in others it may be considered as an act of resistance and contestation (Chapters 5 and 6).

The analytical chapters in this thesis show that with these central tenets as a starting point, the environmental mobilities approach is a flexible framework that works well in combination with other theoretical approaches to explore both the personal and everyday dimension of life and mobilities under climate change, i.e. people's perceptions and meaning-making (Chapter 5), as well as the dimension of multi-scalar power structures and governance (Chapters 4 and 6), and how these relate to each other – this will be considered in greater depth in the answers to Research Questions 2 and 3.

7.1.2. Risk perceptions and affective sense-making of climate change and im/mobilities

This thesis is partly inspired by, and positioned in, what Arnall (2015) has identified as the 'third wave' of research on the climate change-migration nexus, centring on everyday experiences and people's sense-making of climate change and its consequences for them[17]. Based on this, the second research question aims to elicit how risk perceptions in the context of a changing climate shape people's engagement in im/mobilities.

As I have shown in this thesis, environmental im/mobilities are not a direct result of externally visible environmental changes or objectively measurable vulnerability, though these factors have been frequently used as proxies for migration motives in other studies (Wiederkehr et al., 2019). People's interpretations of changes in their environment are shaped by context-specific socio-culturally constructed views on the human-nature relationship as well as on past experiences. Consequently, im/mobilities are very much shaped by affective sense-making of environmental risks, of the costs and benefits of possible responses as well as previous experiences (Arnall & Kothari, 2015; Harries, 2008; Mortreux & Barnett, 2009; Parsons & Østergaard Nielsen, 2020). To study the meaning of environmental im/mobilities beyond observing movement or non-movement, this research has shown that it is insightful to differentiate between perceptions and subjective sense-making of a) climatic and environmental changes, of b) people's susceptibility to these changes as well as c) of their options for response in the analysis of environmental im/mobilities

In this thesis, I have focused specifically on the affective dimension of risk perceptions, i.e. how feeling safe tends to be more important than objectivised risk assessments (Harries, 2008, 2017). Central to this is trust in the constancy of one's identity and socio-natural surroundings, which I conceptualised in this thesis as existential or ontological security. Taking this perspective, I showed how relocation from the village of Villa Santa Lucía is not considered necessary by the local population, as there is no shared perception of any particular danger from advancing climate change as communicated by

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[17] This is in contrast to the first wave, which focused on numerical predictions, and the second wave, which focused mostly on analysing migration drivers (Boas & Wiegel, 2021a; Klepp, 2017).

scientists and government authorities, nor are there alternative locations that are locally considered safer than the current village (Chapter 5). Labour mobilities from Monte Patria, on the other hand, are locally considered not in terms of climate change adaptation, but rather as a response to the underlying problems of water scarcity and a lack of power among smallholders and agricultural workers. Engaging in mobilities is perceived there as a normal and potentially positive response to the structural economic insecurity in this rural context, rather than an expression of desolation and choicelessness (Chapter 4). While Chapter 6 is not based on empirical data that could provide first-hand insights into perceptions of climate risks and mobility options, primary research cited in this chapter has for example shown that resettlement interventions in Jakarta, Indonesia, ostensibly designed to improve quality of life, are perceived by many of those affected as more detrimental to their livelihoods than the floods and other environmental changes themselves (van Voorst & Hellman, 2015).

These examples from the different case studies included in this thesis show that the often hegemonic policy or 'expert' discourses about climate risks and necessary mobility responses can be quite removed from community sense-making of climate change effects, risks to local livelihoods and suitable responses. In fact, the tensions or open conflicts found in the analytical chapters of this thesis can be traced back to such insufficient attention to local perceptions: The unrepresentativeness of the externally applied label of 'climate migrants' in Monta Patria (Chapter 4), the local authorities' bafflement about people's continued refusal to relocate in Villa Santa Lucía (Chapter 5), as well as strong resistance to the top-down decisions to relocate communities for the 'greater good' of climate adaptation (Chapter 6) are evidence of a lack in insight by external experts and policy makers into local sense-making of climate change effects and of suitable responses. Such incongruence between external representation and local risk perceptions, if not addressed in climate change-related policy making particularly where it affects people's im/mobilities, can lead to maladaptation and significant conflicts, as shown in Chapters 5 and 6 (Eriksen et al., 2021; van Voorst & Hellman, 2015).

In light of my objective to contribute to pluralising and politicising the climate change-migration nexus with this thesis (see also Baldwin, 2014; Bettini, 2017; Klepp & Herbeck, 2016), I consider that an explicit research focus on local risk perceptions, ontological security and socio-culturally-specific sense-making of relocation needs, can provide the necessary heterogenous understandings of climate change risks and responses. This expands on the mobilities approach by including concepts for analysing the affective, micro-level dimension of environmental im/mobilities in the everyday (Kothari & Arnall, 2019; Mortreux & Barnett, 2009; Parsons & Østergaard Nielsen, 2020), and contributes to giving voice and priority to affected communities, engaging with multiple knowledges on the issue, rather than reproducing dominant discourses on the topic (see Boas et al., 2019; Eriksen et al., 2015).

7.1.3. Power, climate change effects and im/mobilities

The third research question places environmental im/mobilities in relation to existing and evolving multi-scalar structures of power, and aims to explore the different roles these play in shaping both local climate change effects and environmental im/mobilities. Synthesising the insights from the different chapters of this thesis, there are three main ways in which power relations are relevant to analyse in environmental im/mobilities. These are summarised here in terms of 1) the uneven capabilities to fulfil im/mobility aspirations, 2) in terms of the representation of environmental im/mobilities, and 3) in terms of the political ecology of climate change shaping people's susceptibility and response options to environmental and climatic changes.

The first element of understanding the impact of power structures on environmental im/mobilities relates to the analytical distinction between im/mobility aspirations and capabilities (Carling & Schewel, 2018; de Haas, 2014; Schewel, 2019). In Chapters 2 and 3, I emphasise how the capabilities to fulfil im/mobility aspirations are unevenly distributed. People's capabilities are determined by a range of factors, such as personal and network resources and levels of external control, shaping how environmental im/mobilities are enacted, embodied and experienced (Cresswell 2010). Though often not as clear-cut in practice[18], the analytical distinction between capabilities and aspirations allows to understand how both relative mobilities and relative immobilities can be of a very different quality and meaning for the people involved, and reflect their positionality in interlacing structures of power.

In Chapter 4, for example, this analytical distinction helped to understand how otherwise disenfranchised agricultural workers and small to medium-scale farmers have capabilities (in terms of access to social and professional networks) that allow for relatively low-threshold access to labour mobilities towards the mining sector. Over time, this has led to an increasing reliance on income from the mining sector, supplementing or even replacing agricultural household income in the rural municipality of Monte Patria. In the case of Villa Santa Lucía analysed in Chapter 5, and the Dutch villages described in Chapter 6, the populations could contest top-down relocation policies due to relatively high political bargaining power in their respective contexts, to fulfil their aspirations of avoiding relocation – which stands in stark contrast to the rather forceful evictions in the cases studied in Pakistan and Indonesia. This underlines how "[m]obility is a resource that is differentially accessed" (Cresswell, 2010, p. 21) – or, in other words, autonomy about one's im/mobility is unevenly distributed, and consequently can be experienced very differently. A focus on uneven im/mobility potentials (or motility, see Blondin, 2020; Kaufmann et al., 2004) is thus a necessary component of power-sensitive analyses of environmental im/mobilities.

The second element of understanding the impact of power structures on environmental im/mobilities relates to their representation (see Cresswell 2010). Examples from the different case studies presented in this thesis highlight the central role of discursive power differentials, i.e. the power to impact what story is told about certain im/mobilities, in shaping environmental im/mobilities and their governance. In the case of Monte Patria, the narrative of 'climate migration' has become the dominant national discourse despite its incongruence with local understandings of the issue. This silences the role of structural water shortage and the resource-exploiting agricultural economy in shaping the effects of the drought, and thus locates the responsibility to act beyond the capacities of the local or regional governments (Chapter 4). In Chapters 5 and 6 discursive power takes the form of inscribing places with vulnerability to climate change: In Villa Santa Lucía this was used by local authorities to justify the highly unpopular village resettlement policies. In the Dutch, Pakistani and Indonesian cases analysed in Chapter 6, the climate change narrative was used by the respective government institutions to legitimise interventions in the name of climate change and development, which required the relocation of certain – often already marginalised – groups of residents.

These examples show how differently environmental im/mobilities can be depicted in hegemonic (policy) discourse: either as problematic and emblematic of desolation, or as necessary and legitimate despite local opposition. Importantly, such representations also establish a certain framing of the link between im/mobilities and climate change: Discourses of 'climate migrants' or 'climate-vulnerable

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[18] Capabilities as well as aspirations are of course subject to change over the course of a lifetime, and capabilities also shape aspirations, and vice versa (Carling & Schewel, 2018).

areas that must be evacuated' are representations of a simplistic causal relationship, which fail to account for how the effects of climate change are often indistinguishable from other environmental changes, and that they are strongly shaped by factors such as resource use and distribution, the existence of protective measures and adequate response mechanisms (Elmhirst et al., 2018; Foresight, 2011; Kelley et al., 2021). Furthermore, the 'climate change' framing has the effect of associating any intervention with urgency and danger, legitimizing even unpopular adaptation measures (see Chapter 6). Such representations impact the practice of environmental im/mobilities by shaping governance approaches and policy developments that enable, enforce or hinder im/mobilities (Cresswell, 2010; Sheller, 2018b).

This is captured in the concept of *climate mobility regimes*[19] (Boas et al., 2022; Farbotko, 2022). Defined here as "the (in)formal governance arrangements seeking to frame, manage, and regulate the relation between mobility and climate change" (Chapter 3.6., this thesis), this concept can be applied to analyse understand how and whose environmental im/mobilities become institutionalised and regulated. Echoing Cresswell's (2010) *Politics of mobility*, which holds that mobilities encompass not only movement, but also practice and representation (see Introduction and Chapter 3), the concept of climate mobility regimes can serve as an analytical tool to pinpoint the role of power relations – as well as their contestation – in environmental im/mobilities.

A third element of understanding the impact of power structures on environmental im/mobilities, as proposed in this thesis, is to analyse how people's susceptibility to climatic and environmental changes, as well as their response options, are shaped by uneven relations of power. Put differently, this is about understanding why some populations are more vulnerable to the effects of climate change than others in the first place, and how their position in the configurations of power relations limit or enable their options for response – including im/mobilities – to the changes they experience (see Elmhirst et al., 2018; Marino & Ribot, 2012). My findings highlight how the existing marginalisation of some groups, be they defined by socio-economic, political, cultural and/or geographic parameters, enhances both their exposure to, and limits their options to respond to changes in their environment. While this may seem intuitively obvious, this double exposure is to date often not sufficiently included in studies of environmental im/mobilities (Parsons & Østergaard Nielsen, 2020; Zetter & Morrissey, 2014).

In response to this oversight, this thesis provides an analytical lens for such research, drawing inspiration from the literature on the political ecology of climate change adaptation and migration, and develops a fluid and agentic understanding of im/mobilities in a politicised environment shaped by uneven socio-political and economic relations. In Chapter 4, this is used to analyse how socio-economic marginalisation leaves smallholders highly susceptible to increasing droughts in a context of structural water shortage. They neither have means to adapt *in situ* nor political bargaining power in the water committees to affect change in water management. Here, unequal access to water and capital as well as limited options for locally earning a good income are important reasons for to engage in the existing pattern of labour mobilities to the mining industry. In Chapters 5 and 6, it is predominantly peripheral rural or marginalised urban populations that are considered as having to resettle, for their own protection or that of other population segments prioritised by the respective policy-makers. In the cases of Villa Santa Lucía, Chile, and the Dutch villages, contestation of these top-

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[19] As explained in Chapter 3, I have maintained the phrasing of '*climate* mobility regimes' as developed by Farbtoko (2022) and Boas et al. (2022) in order to emphasise how 'climate change' can be used as a discursive tool, while in the rest of this thesis I use the term '*environmental* im/mobilities' as explained in the Introduction.

down resettlement policies was successful, whereas in Jakarta, Indonesia, and Basha, Pakistan, relocation efforts continued – despite protests that these, while ostensibly improving people's quality of life, could interrupt important social, economic and cultural networks.

All in all, I have shown in this thesis how different types of power relations impact environmental im/mobilities in a diverse range of contexts, both by shaping local translations of climate change into perceivable effects and people's susceptibility to these, as well as by structuring the options for im/mobilities as a response to these changes (through practice and representation of im/mobilities). These elements provide entry points for a more power-sensitive analysis of the environmental im/mobilities. In conjunction with the environmental im/mobilities perspective presented above, this approach provides a pathway for increasing the politicisation of the climate change-migration (or mobility) nexus, as has been called for by authors such as Baldwin (2014), Klepp & Herbeck (2016) and Bettini (2017).

7.2. Reflections on the implications for environmental im/mobilities research

With this thesis, I aimed to gain a situated understanding of everyday im/mobilities in a changing climate and against the backdrop of intersecting and uneven relations of political and socio-economic power. Based on the premise that the societal effects of climate change are best understood as they play out in people's lived realities (Arnall, 2015; Arnall & Kothari, 2015; Kothari & Arnall, 2019; Parsons, 2019; Parsons & Østergaard Nielsen, 2020), I chose an explorative research approach and analysed a variety of contexts ranging from slow-onset to rapid-onset events, from cases of mobilities to relative immobilities, from higher to lesser degrees of voluntariness in im/mobilities. My findings challenge the often simplistic and deterministic assumptions underlying both the element of 'climate change' as well as that of 'migration' – which involves balancing the delicate line of critically questioning the very subject of inquiry while arguing for its continued relevance to current climate change research (see Durand-Delacre, 2022a). *Environmental im/mobilities*, then, emerge from this study as a starting point for an expanded, broadened, pluralised research agenda on this nexus.

In this section, I reflect on the research outcomes and their implications from three angles: in terms of how my findings are embedded in the development of the field as a whole, in terms of the politics of scale and multiscalar research approaches, and in terms of knowledge production and epistemic justice.

7.2.1. Critical studies on the climate change-migration nexus today
Over the course of this PhD project, the research on the climate change-migration nexus has grown significantly in numbers and conceptual diversity (Piguet, 2022; van der Geest, de Sherbinin, Gemenne & Warner, 2023), which has made it an exciting time to work on this topic. While the alarmist storylines continue to be important in certain media, policy and even academic circles, there is now a wider acceptance of the multicausality and complexities around the climate change-migration nexus (IPCC, 2022; Martin et al., 2022). This might be attributed to the growth particularly of the 'critical climate migration studies', which calls for caution in making generalisations about the relationship between climate change and migration, or predictions about future dynamics (Durand-Delacre, 2022a).

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The diversity of how climate and environmental changes relate to population movement is increasingly recognised in academia and beyond, which is reflected in the growing use of the (non-conceptual) term 'mobilities' to indicate a greater variety of movements than typically associated with 'migration' (Nature Climate Change Editorial, 2019). For example, the 2022 IPCC report as well as recent IOM policy briefs (Oakes, Banerjee & Warner, 2020; Thornton et al., 2021) refer to mobilities, there is now a 'Climate Mobility' journal (as part of Frontiers in Climate, since 2022) and, as of June 2023, an Environment and Climate Mobilities Network (www.climatemobilities.network).

In terms of research approaches, particularly publications based on empirical research have increased significantly over the last years, with a large diversity in geographical foci, types of climate or environmental changes and types of mobilities. Other trends in this research field are meta-analysis and systematic reviews that show mobility patterns beyond the context-specific cases, multi-level analysis combining meteorological data with surveys, the proliferation of the aspirations and capabilities framework as well as several cross-cutting themes related to the climate change-migration nexus, such as health, conflict, habitability and gender (see e.g. de Sherbinin et al., 2022; Piguet, 2022; Piguet, Kaenzig & Guélat, 2018; van der Geest et al., 2023 for reviews of recent research trends and theoretical approaches).

Over the past years, the mobilities approach (as coined by Urry and Sheller) as a lens to study the climate change-migration nexus has become an established analytical perspective (Baldwin et al., 2019; Cundill et al., 2021; Everuss, 2023; Parsons, 2019; Sheller, 2018b), in part also thanks to the contributions that come from this PhD project and related efforts (e.g. Boas et al., 2019; Boas & Wiegel, 2021a; Wiegel et al., 2019;). The environmental im/mobilities approach has since been applied to study a wide variety of cases around the globe that have been published in numerous academic articles and chapters, including a special issue (Boas et al., 2022; see Chapter 3 for an overview).

The studies applying a mobilities perspective to the climate change-migration nexus have advanced the field in particular by showing how different types of mobilities and immobilities intersect as households and communities respond to the growing challenges posed by climate change in an already uneven and mobile world, confirming the findings from Chapters 4 and 5 of this thesis. The difficulties of staying in climate change-affected places have also been studied through the mobilities approach, providing both insights into cases of lacking mobility potential (Blondin, 2020, 2021b) as well as into cases of immobility as resistance to climate migration discourses (Farbotko, Dun, Thornton, McNamara & McMichael, 2020; Suliman et al., 2019), as has also been discussed in Chapters 5 and 6 of this thesis. Other important contributions of environmental mobilities studies are the growing understanding of how human im/mobilities intersect with, or are shaped by, those of communication technology, risks, viruses, animal mobilities (Boas, 2022; Zickgraf, 2018b, 2022) as well as that of ideas and discourse (Durand-Delacre, 2022a, 2022b). Recent studies on climate migration regimes (Boas et al., 2022; Farbotko, 2022) and mobility justice (Blondin, 2022; Farbotko et al., 2022; Sheller, 2018b) have contributed particularly to contextualising "empirical results within larger sets of power relations and governance" (Piguet, 2022, p. 10).

Overall, then, it can be argued then that the study of the climate change-migration nexus today is already more pluralised, both in terms of conceptual approaches and research foci, than it was in 2014 when Andrew Baldwin published the article that inspired the title of this thesis. And yet, even in more critical circles, the debates on the topic still seem to struggle with finding a balance between presenting

situated understandings of complex and intersecting dynamics shaping im/mobility decision-making and practice, and the more starkly-formulated emphasis on injustices, forced migration and the need to act on climate change – or in other words, between providing nuance and emphasising urgency. Similar to the emphasis on 'climate refugees' to create awareness in the 1990s and 2000s, formulations such as "climate change uproots people […], driving environmental migration in the face of ecological and societal collapse" (Sheller, 2018b, p. 4); or "climate-forced migration and displacement" by the UN-backed Global Centre for Climate Mobility (n.d.) are still used by researchers and institutions at times to express urgency, even when they are simultaneously invested in rejecting simplistic linkages between climate change and migration.

While such black-and-white depictions tend to speak to the preferences of research funders, advocacy NGOs and governance institutions (Boas et al., 2019), the historical experience with the concept of 'climate refugees' has shown how such discourse can easily be turned from a call for awareness into a securitised narrative (see Bettini, 2013; Durand-Delacre et al., 2021; Methmann & Oels, 2015). This can hinder the conceptual and practical advancement of current debates in this field, such as resettlement and planned relocation due diminished habitability in the context of climate change (Farbotko et al., 2020; Gemenne, Zickgraf, Leigh & Castillo Betancourt, 2021; Horton, de Sherbinin, Wrathall & Oppenheimer, 2021), as well as climate and mobility justice (Bettini et al., 2017; Farbotko et al., 2022; Klepp & Herbeck, 2016; Sheller, 2018b). Based on the insights from this thesis and the development of the research field over the past years, I would argue that for more holistic insights into the climate-change migration nexus, attention to the injustices of climate change and climate mobility regimes should be actively combined with grounded and nuanced research that brings local perspectives into the conversation.

This thesis provides suggestions for such research. Apart from the conceptual and analytical explorations of im/mobilities, perceptions and politics described above, this research as a whole points to two other elements that could help to move the debates on the climate change-migration nexus further: integrating multiscalar research approaches and reflecting on the politics and ethics of knowledge production.

7.2.2. A multiscalar approach to environmental im/mobilities

What emerges from this research project as a whole is the value of studying the research subject at different analytical levels, for example by zooming in and out at different temporal and spatial scales. I did this here by combining the mobilities approach with both a focus on affective risk perceptions – zooming in on local perspectives, and political ecology approaches – zooming out to understand the case's embeddedness in wider power relations extending beyond the case-study level (although this was done across different cases rather than in one study, due to my exploratory research approach). Repeatedly, my analysis has confirmed what has been highlighted by scholars such as Elmhirst et al. (2018), Parsons & Østergaard Nielsen (2020) or Radel et al. (2018): that how people respond to environmental changes is based on their perceptions and (individual and communal) experiences, but also that their affectedness, as well as their im/mobility options, are strongly shaped by their positionality in uneven power relations based on socio-economic, geographic and/or political dimensions.

This invites a deeper reflection on the role of scale in the analysis of environmental im/mobilities than often done to date. Much of the recent research on this topic has a strongly empirical and 'local' focus

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(see Piguet, 2022; van der Geest et al., 2023); it seems that this has become a naturalised entry point for studies applying the environmental im/mobilities approach (as reflected also in Chapters 4 and 5 of this thesis). Even when making references to larger-scale phenomena impacting im/mobilities, for example in decision-making about accessing fishing grounds across national borders (Zickgraf 2022), or about pastoralist herding on increasingly urbanised and privatised land (Boas 2022), these tend to be presented as background regarding their immediate relevance on the local scale rather than as part of a multiscalar analysis of im/mobilities. Important exceptions in this regard are Parsons & Chann's (2019) work on water geographies, hydrosocial power and its impact on climate perceptions and im/mobilities; and, from a translocality approach, the research by Porst and Sakdapolrak (2018) on urban-rural migration under climate change, the socio-spatial dimensions and the simultaneity of mobility and situatedness of migrants and non-migrants across space.

Discussing the concept of scale or implementing explicitly multi-scalar research approaches might come more naturally to human geographers than researchers from other fields of the social sciences. Nevertheless, I would argue that based on the insights of this thesis as a whole, paying more explicit attention to scale can be beneficial for the debates around the climate change-migration nexus. This is because rather than providing an obvious entry point for research, the choice of scale has significant implications for the potential findings. This is referred to as the 'politics of scale' (see Lebel, 2006; Swyngedouw, 2004): when one scale is naturalised as the appropriate level of analysis of a given case, this leads to the prioritisation of certain issues and the invisibilisation of others. Although this is a political act, its justification and implications often remain undefined.

An explicitly multiscalar research approach, on the other hand, can avoid (to the extent possible) such scalar limitations, and provide a fuller picture of the relevant dynamics at play. By linking "the subjective, lived experience of climate change migration to the multi-scalar structures [...] through which it manifests" (Parsons, 2019, p. 671), such analysis can provide a situated understanding of how climate change plays out in everyday life, and how both structure and agency shape household-level decision-making about im/mobilities.

The mobilities approach provides a useful starting point for such analytical endeavour: With its diverse theoretical origins, the mobilities approach already breaks with traditional boundaries of analysis and emphasises the simultaneity of processes at different scales relevant to shaping im/mobilities. Indeed, by "calling into question scalar logics" and "going beyond the imagery of 'terrains' as spatially fixed geographical containers for social processes" (Sheller & Urry 2006, p. 209), the mobilities approach constitutes a critique and an alternative to approaches that focus on spatially defined categories, such as the nation-state, as the default unit of analysis (Durand-Delacre, 2022a). Mobility is considered then as an inherently "trans-scalar phenomenon; the result of factors interacting in complex ways across multiple levels of analysis" (Parsons, 2019, p. 681). Though the importance of integrating different levels of analysis is frequently referred to in publications on the environmental im/mobilities perspective (see e.g. Cundill et al., 2021; or Chapter 2 of this thesis), it seems that this take on scale as proposed by Sheller & Urry (2006) to date is not often applied in this context.

To further the conceptual development of environmental im/mobilities and to deepen the empirical insights of relevant dynamics at play, I consider that integrating explicitly multiscalar research might be a promising approach. This could be beneficial also for adequate environmental im/mobility policy making that goes beyond a focus on the (non-)movement itself, and addresses issues such as uneven

resource access at the source (Elmhirst et al., 2018; Eriksen et al., 2021). Furthermore, such an approach might help to overcome the oscillation between nuance and urgency within critical research on the climate change-migration nexus, as discussed above: Explicitly multiscalar research approaches provide pathways of analysis that allow for nuanced accounts of local-level dynamics, while also paying attention to their embeddedness in power relations playing out beyond the case-study level – and which are often more important for affecting change than addressing specific problems at a local level (Natarajan et al., 2019; Porst & Sakdapolrak, 2018; Radel et al., 2018). As such, the insights from this thesis could provide helpful pointers for advancing the current debates on topics such as resettlement, habitability and climate or mobility justice (Farbotko, 2018; Farbotko et al., 2022; Horton et al., 2021).

7.2.3. Reflections on the politics of knowledge production and epistemic justice

Another theme recurring in all the analytical chapters of this thesis (though mostly implicitly) is the role of knowledge production on the climate change-migration nexus. With this, I refer to how certain perspectives, narratives and facts come to be considered as 'knowledge' on the topic, whereas others get neglected or even discredited. Studying the politics of knowledge production on environmental im/mobilities involves paying attention how certain discourses come to take a hegemonic role, and what this effect this has (Doughty & Murray, 2016). In this section, I will reflect on how this plays a role in social scientific research on the climate change-migration nexus in general, and in this study in particular.

The different cases analysed in this thesis illustrate how hegemonic discourses about the risks of climate change promote specific ideas about the relationship between these risks and human im/mobilities, as well as about what constitutes an adequate response on policy or household levels. In answering my third research question above, I have analysed this through the element of *representation*, based on Cresswell's politics of mobilities (2010). The 'climate migration' discourse in Monte Patria, the inscription of climate vulnerability in Villa Santa Lucía and the resettlement legitimised as national climate adaptation in the Netherlands, Indonesia or Pakistan are examples of how some environmental mobilities come to be seen as emblematic of desolation and choicelessness, whereas others are considered as necessary and legitimate. I showed how in either case, these hegemonic discourses tend to be quite removed from local understandings of these issues, in some cases to detrimental effect.

The knowledge production around the climate change-migration discourse has also been analysed with other approaches. For example, critical (discourse) analyses of the alarmist and securitised 'climate refugee' narratives highlighted the political motivations and problematic consequences of such framing, and were fundamental in establishing more nuanced perspectives on the relationship between climate change and migration (e.g. Bettini, 2013; Boas, 2015). One more recent example is the study of Durand-Delacre (2022a), who through the lens of 'epistemic mobilities' highlights how among French development professionals, NGOs, academics and the media discourses around 'climate migration' are mobilised, reproduced and contested in what is essentially an unstable and fragmented stakeholder network. Studying the 'climate mobilities regime', as outlined in Chapter 3, likewise requires attention to knowledge production about these mobilities, as this shapes how they are addressed and regulated (Boas et al., 2022). This can be seen for example in the work of Farbotko (2022), who analyses contestations of the hegemonic 'climate displacement' mobility regime established by national and international actors around the 'sinking island state' Tuvalu. What such analyses from the critical social sciences have in common, despite their slightly different entry points,

7

is their scrutiny of how knowledge about the climate change-migration nexus is produced, particularly in media and governance arenas.

Such critical inquiry into the politics of knowledge production of environmental im/mobilities in media and policy arenas also invites a reflection of the role of *social sciences research* itself in these processes. One important dynamic in this context has been highlighted in the article *Climate Migrations Myths* (Boas et al., 2019): if research funding schemes are based on alarmist securitisation narratives, only "weak scientific evidence that reinforces the self-perpetuating myth of climate change migration as a looming security crisis" will be produced (p. 902). Apart from this more obvious way of steering knowledge production, however, also power-sensitive research approaches to the climate change-migration nexus have ethical and political implications for knowledge production that require some discussion (Butz & Cook, 2018; Given, 2008). In the remainder of this section, I will reflect on these by drawing on Mimi Sheller's *Mobility justice* (2018b), and in particular the element of 'epistemic justice'.

Sheller considers mobility justice both as a normative moral goal, and as an approach to analysing the "politics of unequal capabilities for movement, as well as on unequal rights to stay or dwell in a place" (2018b, p. 1). As an analytical tool, it is concerned with questions about whose perspectives are prioritised, which discourses become hegemonic, and to what effect, particularly for the already marginalised who are most affected by climate change. For Sheller, epistemic justice is an integral part of mobility justice[20]. Originally coined by Miranda Fricker (2007), epistemic *injustice* can be defined as "forms of unfair treatment that relate to issues of knowledge, understanding, and participation in communicative practices" (Kidd, Medina & Pohlhaus Jr., 2017, p. 1) such as exclusion, silencing, distortion of meaning, etc. – in short, unfair treatment regarding a person's "capacity as a knower" (Fricker, 2007, p. 1; see also Butz & Cook, 2018). Conversely, epistemic *justice* is the avoidance of such maltreatment. From this definition, the failure to consider local perspectives in the dominant discourses as analysed in Chapters 4, 5 and 6 constitutes epistemic injustice.

But working towards epistemic justice particularly in the context of climate change and mobilities, Sheller writes, goes beyond "procedural inclusion" (2018b, p. 33) of local knowledge. Instead, based on a science and technology studies perspectives, she argues that knowledge must be considered as ever emergent and contestable, and such work therefore "involves recognising and creating new forms of knowledge, new facts, and new ways of reconciling seemingly incommensurable ways of knowing" (Sheller, 2018b, p. 33). This, then, is the element where social scientists might be said to contribute most to mobility justice – but also the element where they can perpetuate epistemic injustices with unsound or unreflective research practices.

Many critical scholars to the climate change-migration nexus already start from a normative standpoint similar to Sheller's. Although this typically remains implicit, this standpoint shapes their research objectives and questions to focus on the perspectives of those marginalised or otherwise silent in the public discourse (see e.g. the elderly Cambodian beggar in Parsons, 2017; Thai rural-urban labour migrants working under precarious conditions in Porst & Sakdapolrak, 2018; or indigenous perspectives from low-lying Pacific island states in Farbotko & Lazrus, 2012). This thesis, which analytically prioritises local sense-making of climate change and mobilities by rural communities, is another example of such research. As a minimum, this stance requires transparency and reflection on

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[20] The other justice elements discussed by Sheller (2018b, p. 35) are distributive justice, deliberative justice, procedural justice and restorative justice.

the role and positionality of the researcher, particularly if following a constructivist epistemology (see Introduction) that considers knowledge as co-produced between research participants and researcher (Creswell, 2009; Given, 2008).

Regarding my own fieldwork, I think it important to acknowledge my own position as an outsider, both to Chile in general and the rural case studies in particular, and with language skills in Spanish (and the particular Chilean vernacular) acquired only shortly before and during the fieldwork. This makes it highly probable that I missed some of the deeper levels of association and connotation in my conversations with research participants. Although I triangulated the more factual information, subjective valuations or subtle historical references that were only hinted at in conversations (important in a country with such a still-polarising history as Chile) might have been lost to me, or not fully understood. Moreover, as an obvious foreigner, a *gringa*, a few of my conversation partners and interviewees were at first somewhat suspicious about my intentions and the use of the collected data, despite my openness on this topic, and were hesitant to share more controversial opinions. It is impossible for me to tell whether they would have been more open or restricted in talking to a Chilean researcher about these topics. While I consider to have acquired a rich set of data despite these shortcomings, it is important to acknowledge these gaps.

Furthermore, while I did focus on local perspectives on underlying problems such as resource distribution in Monte Patria, and the community refusal to relocate in Villa Santa Lucía grounded in their understanding of human-nature relationships, and prioritised local sense-making in my study, the empirical research conducted for this PhD research has not been emancipatory research. Emancipatory research is collaborative rather than participatory, and addresses important social issues and inequalities with "an agenda for reform that may change the lives of the participants, the institutions in which individuals work or live, and the researcher's life" (Creswell, 2009, p. 27; Kindon, Pain & Kesby, 2007). In its research design, this study did not explicitly set out to be emancipatory or transformative, and was mostly focused on developing an understanding of how the research participants made sense of the issues pre-defined as my research interests (such as 'climate migration discourse' or 'the need to relocate'), which did shift slightly based on the insights gained during fieldwork. In the process of data analysis and writing, the research participants did not have a direct impact, and despite my best intentions to write balanced, respectfully and in a manner protective of people's identities, they might have requested some changes if they'd had the chance.

This way of approaching empirical research is, I think, quite common research practice even among researchers prioritising grounded accounts of the lived experiences of im/mobilities in the context of a changing climate (see e.g. Piguet, 2022, or van der Geest et al., 2023, on the current prevalence of empirical research approaches). Such research allows for developing a situated and nuanced understanding of the societal effects of climate change, including im/mobilities, in a variety of different contexts. This work is certainly important since, as Parsons writes, "climate change mobility is not an aggregable phenomenon, but one which must be interpreted and built upwards from individual accounts" (2019, p. 672). However, to be fully consistent with the normative starting point that shaped my own research focus and that of so many colleagues in this field, it might be recommendable to incorporate more emancipatory approaches in the research on the climate change-migration nexus. These might not only contribute to enacting positive change in the lives of community co-researchers and to creating greater epistemic justice (Fricker, 2007; Sheller, 2018b), but as a side benefit, such

7

more open-ended research approaches might even move the academic debates on the climate change-migration nexus in as yet unexpected directions.

7.3. Recommendations for future research

Considering the recent exponential growth of research on the climate change-migration nexus (Piguet, 2022), I have no doubt that this will continue to be a topic of much academic research and debate in the future. In this section, I present five research recommendations based on the insights gained from this doctoral research, which can further the agenda of pluralising and politicising the climate change-migration nexus through an environmental im/mobilities approach.

Firstly, following the theoretical considerations sketched out above, future research could work towards a more integrated analytical framework that prioritises multiscalar analysis of environmental im/mobilities and allows for zooming in and out to focus on the various elements that are simultaneously at play in shaping these im/mobilities (see Parsons, 2017). Making such multiscalarity explicitly central to the analysis shows both the specificity of the new challenges posed by climatic changes, as well as their interconnectedness to other existing problems. Such detailed insights are a necessary basis for adaptation policy-making attuned to the specific context.

Secondly, a recent development in research on the climate change-migration nexus is the increasing focus on the concept of habitability (HABITABLE, 2023; Horton et al., 2021; O'Byrne, 2023), giving more prominence to the current discussions around planned retreat (O'Donnell, 2022). Habitability, defined as "the environmental conditions in a particular setting that support healthy human life, productive livelihoods, and sustainable intergenerational development" (Horton et al., 2021, p. 1280)**,** tends to be discussed in an inverse relationship with migration, assuming that decreased habitability, or uninhabitability, lead to planned resettlement in the best case and unsupported outmigration in the worst (O'Byrne, 2023). As such, habitability is a very place-centric concept, which is somewhat at odds with an understanding of place from a translocal or (environmental) mobilities perspective as discussed in this thesis. Given the high level of policy relevance concepts such as habitability and planned retreat have, future research could explore what theoretical contributions a mobile and relational understanding of place can bring to the concept of habitability.

Thirdly, a recurring element in the analytical chapters of this thesis were labour mobilities, and their already important role in economic and social life in rural Chile and beyond. These could become a more explicit entry point into the study of environmental im/mobilities in future research, exploring questions of how climatic changes impact different labour mobilities, and how this kind mobilities is considered by those participating in them in relation to climate change (see Radel et al., 2018). An interesting element to add to such research could be the distribution along gender roles. Both in Monte Patria and in Villa Santa Lucía, some types of labour mobilities were customarily strictly divided by gender, although particularly in the northern case the continuing droughts had somewhat changed this division. Future research could investigate further how changes in the environment impact the gender dynamics of labour mobilities in rural, natural resource-dependent contexts, and how this plays out in different sectors.

Fourthly, the environmental im/mobilities approach emphasises how mobilities should not be considered as novel or exceptional under climate change, but rather that we should focus on how *existing* mobility patterns are impacted by environmental changes (Hannam et al., 2006; Kelley et al., 2021; Sheller & Urry, 2006). Future research could deepen such insights by including more explicit analyses on these established patterns of mobilities, for example by dedicating more space to historical analyses of im/mobilities as well as the factors through which they have become established, challenged and changed over time. These insights would serve to better contextualise and compare current day changes and trends and would thereby allow a deeper understanding of the dynamics at play today.

And lastly, based on the reflections on knowledge production and epistemic justice above, I recommend future research on the climate change-migration nexus to include more emancipatory research approaches and methods, following the guidelines of e.g. Kindon et al. (2007). Such approaches can help to avoid epistemic injustices by involving research participants as "reflexive knowledge producers" rather than local "informants" (Butz & Cook, 2018, p. 86), who based on their lived experiences co-create research insights together with the (academic) researcher. Emancipatory research approaches have a very specific set of ethical implications and limitations, which require careful reflection, preparation and discussion on part of the researcher (Creswell, 2009; Lenette, 2022). If well-implemented, however, these approaches can promote the inclusion of diverse perspectives, particularly those marginalised by classic research approaches, to study and transform locally relevant issues, thereby contributing to more diverse and just insights on the climate change-migration nexus.

7

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English summary

Spanish summary

About the author

Publication list

Acknowledgements

WASS Education Certificate

English summary

The figure of the 'climate migrant' has become emblematic of the severe societal consequences of climate change. In media, policy and even academic arenas, it is often assumed that increasing sea-level rise, droughts or heat waves will directly cause a significant number of people to leave their homes in the (near) future. Some consider these people desolate climate refugees, others consider them to be adaptive migrants who can contribute to household-level resilience – but from both perspectives migration is considered as linear and exceptional, as a decision only taken because of advancing climate change.

However, a growing number of empirical studies point to a more complex relationship between climate change and migration. They show that migration decision-making is dependent on multiple factors, that people might not want to or be able to move when environmental conditions worsen, and that migration is not always long-distance, but might also take place through incremental, cyclical and repeated movements. These insights require a rethinking of how the climate change-migration nexus is conceptualised.

In this thesis, I seek to open up the dominant perceptions and explanations of how climate change and migration interconnect, to broaden our understanding of how these are nested in existing relations of power and, most importantly, to bring local interpretations of the climate change-migration nexus into the conversation. I do so by developing an *environmental mobilities* approach as an entry point for studying how people make decisions about moving or staying in place under a changing climate. Three research questions have guided this study:

1. What can an environmental mobilities perspective contribute to the study of the climate change-migration nexus?
2. How do local perceptions of climate change and its related risks shape environmental im/mobilities?
3. How do power relations shape environmental im/mobilities?

These questions are answered in the body of this thesis, which is comprised of two conceptual and three analytical chapters. Chapter 2 is a proposal of applying the mobilities approach as developed by John Urry and Mimi Sheller to the case of human mobilities in the context of environmental changes. Based on a review of the shortcomings and challenges of earlier research approaches and conceptualisations in 'climate migration' studies, this chapter elaborates on the concept of environmental im/mobilities. It highlights how, through this lens, a broader range of interrelated mobilities – and relative immobilities – becomes visible as affected by climate change. Furthermore, it emphasises the uneven distribution of mobility potentials, reflecting power relations spanning different scales. This chapter sets the scene for the rest of this thesis.

Chapter 3 elaborates on several (related) theoretical concepts, most importantly on the concept of environmental mobility regimes, and discusses the methodological implications of the environmental mobilities approach. As this chapter was written three years after the article appearing here as Chapter 2, it also reviews the significant advances that have been made in this field since it was established in 2018.

Chapter 4 is the first analytical chapter in this thesis, based on ethnographic fieldwork in drought-affected Monte Patria in central-northern Chile. In this chapter, I explore why the 'climate migration' discourse is at odds with local perception of climate change and migration pressures. Combining the environmental mobilities approach with an analysis of the political ecology of climate change, this chapter emphasises how the local agricultural economy is characterized by uneven resource access and the limited political bargaining power of smallholders. In this context, circular labour mobilities to the northern mining sector are considered a normal and potential positive household-level response to economic insecurity.

Chapter 5 is similarly based on an empirical case study in Chile, this one located in Patagonia, southern Chile. This chapter analyses why the population of the mudslide-affected village Villa Santa Lucía prefers to remain in place rather than relocate to safer grounds, despite the dangers of progressing climate change emphasised by scientists and the local government. Through the lens of ontological security, or people's sense of existential safety, this chapter zooms in on the role of people's sense-making of perceived risks and migration pressures to explore reasons for voluntary immobility in a context characterised by normalised labour and educational mobilities.

Chapter 6 continues with the theme of top-down community relocation in the name of climate change adaptation, in this case as a direct or indirect consequence of flood adaptation infrastructure interventions. The need of protecting the wider population is here used to legitimise these interventions, and the chapter presents cases from the Netherlands, Pakistan and Indonesia in which and policies have been contested by the local populations, with different levels of success. The argument made in this chapter is mainly ethical: Rather than merely technical interventions, this chapter argues that climate change adaptation interventions, especially when used to legitimise displacement and other forms of mobilities, need to be considered as inherently political, and require reflections about their uneven distribution of costs and benefits. This chapter thus broadens the scope of how the relationship between human mobilities and climate change (adaptation) is analysed.

In the Conclusion, I synthesise and discuss my research findings and reflect how they have contributed to a pluralised understanding of the climate change-migration nexus. I conclude that the environmental im/mobilities approach, with its emphasis on the heterogeneity and relationality of mobilities, constitutes a promising approach for developing grounded understandings of how climate change effects people's im/mobilities in their everyday lives. In combination with other theoretical lenses, this perspective provides an approach for studying both affective sense-making in mobility decisions, and the role of power relations both in translating climate change effects into locally perceivable effects and structuring people's options for response, including mobilities.

I end this thesis with reflections on the implications of the research findings: Firstly, assessing the developments in 'climate migration' studies over the past years, I conclude that research in this field has become significantly more pluralised and power-sensitive, but has still not overcome the seeming incompatibility between providing nuance of environmental im/mobilities and emphasising the urgency to act on climate or mobility injustices. Based on the insights from my thesis as a whole, I suggest that this may be addressed by paying explicit attention to scale in analytical approaches, and to develop more multiscalar studies on environmental im/mobilities. Furthermore, through the concept of epistemic justice, I reflect on the politics and ethics of knowledge production, on my

positionality as a researcher and on the potential of emancipatory research approaches for more just research on environmental im/mobilities. The thesis ends with recommendations for future research.

Spanish summary

La figura del 'migrante climático' se ha convertido en un emblema de las graves consecuencias sociales del cambio climático. En los medios de comunicación, la política e incluso en los ámbitos académicos, a menudo se asume que el aumento del nivel del mar, las sequías o las olas de calor provocarán directamente que un número significativo de personas abandone sus hogares en el futuro cercano. Algunos consideran a estas personas como desplazados climáticos desesperados, otros los ven como migrantes en proceso adaptativo que pueden contribuir a la resiliencia a nivel del hogar, pero, desde ambas perspectivas, la migración se considera lineal y excepcional, como una decisión tomada únicamente debido al avance del cambio climático.

Sin embargo, un número creciente de estudios empíricos señala una relación más compleja entre el cambio climático y la migración. Estas investigaciones muestran que las decisiones de los migrantes dependen de múltiples factores, que las personas rehúsan el traslado o que no pueden hacerlo cuando empeoran las condiciones ambientales, y que la migración no siempre implica desplazamientos en larga distancia, sino que también puede ocurrir a través de movimientos incrementales, cíclicos y repetidos. En ese sentido, tales revelaciones requieren una reevaluación de cómo se conceptualiza la relación entre el cambio climático y la migración.

En esta tesis, busco abrir las percepciones y explicaciones dominantes en torno a cómo se interconectan el cambio climático y la migración, ampliando nuestra comprensión sobre cómo ellas están enraizados en relaciones de poder y, lo más importante, para incorporar las interpretaciones locales de la relación entre cambio climático y migración en la discusión. Con esas intenciones, desarrollo un enfoque de *movilidades ambientales* como punto de entrada para estudiar cómo las personas toman decisiones sobre moverse o quedarse en un lugar en contexto de clima cambiante. Tres preguntas de investigación han guiado este estudio:

1. ¿En qué puede aportar una perspectiva de movilidades ambientales al estudio del nexo entre cambio climático y migración?
2. ¿Cómo influyen las percepciones locales sobre el cambio climático y sus riesgos asociados en las in/movilidades ambientales?
3. ¿Cuál es la influencia de las relaciones de poder en las in/movilidades ambientales?

Estas preguntas se responden en el cuerpo de la presente tesis, que consta de dos capítulos conceptuales y tres capítulos analíticos. El Capítulo 2 es una propuesta para aplicar el enfoque de movilidades desarrollado por John Urry y Mimi Sheller al caso de las movilidades humanas en el contexto de los cambios ambientales. A partir de una revisión de las deficiencias y desafíos de enfoques y conceptualizaciones anteriores en los estudios de 'migración climática', este capítulo desarrolla el concepto de in/movilidades ambientales. Destaca cómo, a través de esta lente, se vuelven visibles una gama más amplia de movilidades interrelacionadas y las relativas inmovilidades afectadas por el cambio climático. Además, enfatiza la distribución desigual de las potencialidades de movilidad, reflejando relaciones de poder que abarcan diferentes escalas. Este capítulo sienta las bases para el resto de la tesis.

El Capítulo 3 profundiza varios conceptos teóricos (relacionados), destacando principalmente el concepto de regímenes de movilidad ambiental, y discute las implicaciones metodológicas del enfoque

de movilidades ambientales. Dado que este capítulo se escribió tres años después del artículo que aparece como Capítulo 2, también revisa los avances significativos que se han producido en este campo desde su establecimiento en el año 2018.

El Capítulo 4 es el primero de tipo analítico en la tesis, basado en trabajo de campo etnográfico en Monte Patria: una zona del centro-norte de Chile afectada por la sequía. En él se explora por qué el discurso de 'migración climática' está en desacuerdo con la percepción local del cambio climático y las presiones migratorias. Combinando el enfoque de las movilidades ambientales con un análisis de la ecología política del cambio climático, este capítulo enfatiza cómo la economía agrícola local se caracteriza por un acceso desigual a los recursos y el limitado poder de negociación política de los pequeños agricultores. En este contexto, las movilidades laborales circulares hacia el sector minero del norte se consideran una respuesta normal y potencialmente positiva frente a la inseguridad económica a nivel de hogares.

El Capítulo 5 se basa en un estudio de caso empírico en la Patagonia chilena, analizando por qué la población de Villa Santa Lucía, severamente afectada por un aluvión, prefiere quedarse en el lugar en vez de trasladarse a zonas más seguras. Lo anterior, a pesar de los peligros del cambio climático enfatizados por científicos y por el gobierno local. A través de la lente de la seguridad ontológica, o la sensación de seguridad existencial de las personas, este capítulo se centra en el papel de la percepción de riesgos percibidos y en las presiones migratorias, explorando las razones de la inmovilidad voluntaria en un contexto caracterizado por movilidades laborales y educativas normalizadas.

El Capítulo 6 continúa con el tema de la reubicación comunitaria dirigida 'desde arriba' en nombre de la adaptación al cambio climático, en este caso, como consecuencia directa o indirecta de intervenciones de infraestructura de adaptación a inundaciones. En él argumento que la necesidad de proteger amplios segmentos de población es utilizada para legitimar estas intervenciones, presentando casos de los Países Bajos, Pakistán e Indonesia en los que estas políticas han sido rechazadas por poblaciones locales, con diferentes niveles de éxito. El argumento principal en este capítulo es principalmente ético: en lugar de intervenciones puramente técnicas, este capítulo sostiene que las intervenciones de adaptación al cambio climático, especialmente cuando se utilizan para legitimar desplazamientos y otras formas de movilidad, deben considerarse como inherentemente políticas y, por lo tanto, requieren reflexiones sobre la distribución desigual de costos y beneficios. De tal forma, este capítulo amplía el alcance de análisis en torno a la relación entre movilidades humanas y (adaptación al) cambio climático.

En la Conclusión, se sintetizan y discuten los hallazgos de la investigación, reflexionándose sobre cómo han contribuido a una comprensión pluralizada del nexo entre cambio climático y migración. Se concluye que el enfoque de in/movilidades ambientales, con su énfasis en la heterogeneidad y la relacionalidad de las movilidades, constituye un enfoque prometedor para desarrollar comprensiones fundamentadas de cómo el cambio climático afecta a las personas y su movilidades en la vida cotidiana. En combinación con otras lentes teóricas, esta perspectiva proporciona un enfoque para estudiar tanto la construcción afectiva de sentido en las decisiones de movilidad como el papel de las relaciones de poder en dos dimensiones: (a) la traducción de los efectos del cambio climático en efectos localmente perceptibles; (b) la estructuración de opciones de respuesta de las personas, incluyendo las movilidades.

La tesis concluye con reflexiones sobre las implicaciones de los hallazgos de la investigación. En primer lugar, al evaluar los desarrollos en estudios de 'migración climática' durante los últimos años, se concluye que la investigación en este campo se ha vuelto significativamente más pluralizada y sensible al poder. Sin embargo, aún no ha superado la aparente incompatibilidad entre proporcionar matices sobre in/movilidades ambientales y enfatizar la urgencia de actuar sobre las injusticias climáticas o de movilidad. Basándose en las revelaciones de la tesis en su conjunto, se sugiere que esto puede abordarse prestando una atención explícita a la escala en los enfoques analíticos y desarrollando un mayor número de estudios multiescalares sobre in/movilidades ambientales. Además, a través del concepto de justicia epistémica, reflexiono sobre la política y la ética en la producción de conocimiento, en torno a mi rol como investigadora y sobre el potencial de enfoques de investigación emancipatorios para una investigación más justa sobre in/movilidades ambientales. La tesis termina con recomendaciones para estudios futuros.

About the author

Mobility has been an ongoing theme throughout Hanne's life. Born in 1991 in Magdeburg, Germany, she spent a happy childhood in different places in the northern German countryside. After finishing high school and some brief stints in Sweden and Nepal, she came to the Netherlands in 2011 to pursue a BSc in Tourism at NHTV Breda and Wageningen University, to understand the possibilities of socially and environmentally sustainable tourism. It was during the international fieldtrip of this study program that she did a first research project on labour migration in the tourism sector – and questions of migration and mobilities have been central to her work ever since.

During a semester in Istanbul, Turkey, and a Research Master in International Development Studies at Wageningen University, she explored these topics from different academic disciplines, including sociology, human geography and law, and became so fascinated that she decided to do research for a living. After graduating from her Master's (cum laude) in 2017, she started working as a Junior Researcher at the Environmental Policy Group at WUR, developing a PhD proposal on mobilities in the context of a changing climate which received funding by the Wageningen School of Social Sciences. After five years of working on this project, involving countless hours of reading, writing and re-writing as well as a pandemic, a transatlantic move and a maternity-related hiatus, she lives in Santiago de Chile with her husband and son, and continues to explore the interplay between human im/mobilities, relations of power, and climate change.

Publication list

Academic publications

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WASS Education Certificate

Hanne Wiegel
Wageningen School of Social Sciences (WASS)
Completed Training and Supervision Plan

Name of the learning activity	Department/Institute	Year	ECTS*
A) Project related competences			
A1 Managing a research project			
WASS Introduction Course	WASS	2018	1
'A mobilities approach to non-migration in the context of environmental change'	Environmental non-migration: Frameworks, methods and cases, at TU Dresden (DE)	2019	1
'Climate change and migration – it's complicated!'	Climate Makes People Move, at College of Europe, Warsaw (PL)	2022	1
'Complicating the tale of 'first climate migrants'	Dealing with Drought: Water politics, human (im)mobilities and adaptation strategies, at Augsburg University (DE)	2023	1
Reviewing papers and manuscripts, editing Special Issue	Various academic journals/publishers: Ecology and Society, Regional Environmental Change, Journal of Ethnic and Migration Studies, Frontiers in Water, Bristol University Press	2019-2023	3
A2 Integrating research in the corresponding discipline			
Analysing Discourse - Theories, Methods and Techniques (CPT-56306)	WUR	2018	6
Loss, Damage and Mobility in the context of Climate Change	Environmental Humanities Department, KTH, Naples (IT)	2018	2
Emotions in Debates on Natural Resources (WRM-51304)	WUR	2021	4
B) General research related competences			
B1 Placing research in a broader scientific context			
Policy and Governance Theories for Analysing Water Issues (PAP-54302)	WASS	2020	2
Metodologías para el estudio de la conflictividad socio-ambiental en fuentes digitales (Methodologies for studying social-environmental conflicts through digital sources)	Formigas and Iberoamérica Social	2021	2
B2 Placing research in a societal context			
Organisation of international symposium 'Environmental Mobilities' together with Dr Ingrid Boas	ENP/WUR	2019	2.9
Presenting with impact	Wageningen in'to Languages	2021	1
Opinion piece (co-authored)	NRC	2022	0.1

C)	Career related competences/personal development			
C1	**Employing transferable skills in different domains/careers**			
Start to teach	Education Support Centre	2018	1
Supervising BSc and MSc Thesis Students	Education Support Centre	2019	0.5
Supervising BSc and MSc thesis students and teaching assistance	ENP/WUR	2018-2023	4
Mobilizing your scientific network	WGS	2019	1
Total			**33.5**

*One credit according to ECTS is on average equivalent to 28 hours of study load

146