FUTUREMAKING IN A DISASTER ZONE: INDIGENOUS WOMEN, CLIMATE JUSTICE, AND THE EVERYDAY POLITICS OF CLIMATE CHANGE ADAPTATION IN PERU

by

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DISSERTATION ABSTRACT

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Title: Futuremaking in a Disaster Zone: Indigenous Women, Climate Justice, and the Everyday Politics of Climate Change Adaptation in Peru

Indigenous women in Peru are often labeled "triply vulnerable" to climate change due to race, gender, and economic marginalization. Despite Peru's focus on gender, Indigeneity, and intersectionality in national adaptation planning, this blanket label of women's vulnerability persists in local 'disaster zones' like the Andes, where melting glaciers create flooding and water scarcity hazards. This narrative of vulnerability erases Indigenous women's lived experiences and adaptions, positioning them as a "harmed and damaged" group bracing for climate disaster. As a result, most adaptation studies and policies in glaciated regions focus *first* on climate change and *second* on daily life, and only rarely on the intersections of gender, race, and class that shape adaptation futures.

This dissertation draws on interviews, document analysis, archival research, and participant observation to understand how Indigenous women are adapting to climate change in the Peruvian Cordillera Blanca, and how their diverse experiences are reflected by Indigenous women's organizations and the Peruvian state in national level adaptation planning. I draw on a case study in the Cordillera Blanca mountain range—as well as an analysis of gender and Indigeneity in national adaptation planning—to show how

Indigenous women's adaptation experiences and demands play out across scales. I conducted fieldwork over the course of five cumulative months between 2017-2019, and I collaborated with a local researcher in the Cordillera Blanca to conduct in-depth interviews between 2020-2022.

The dissertation includes three findings: 1) Quechua women in the Cordillera Blanca engage in futuremaking, a framework that centers a fuller understanding of the everyday needs and desires of women and the communities they support, as opposed to the singular focus on interventions to reduce flood risk; 2) Indigenous women leaders in Peru draw on their territorial claims and resistance to extractive activities to re-make adaptation planning into a space that centers Indigenous sovereignty, and; 3) Quechua women's labor in home gardens underpins community adaptations, upending regional templates of adaptation as infrastructure and hazard reduction. Ultimately, this research shows how Indigenous women's futuremaking practices, adaptation labor, and resistance to territorial dispossession in Peru identify different risks and adaptation futures compared to hazard-focused researchers and policymakers.

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I. INTRODUCTION

In the summer of 2019, I took a local bus to my friend Rosa's house, which is located in the middle of a glacial lake outburst flood (GLOF) hazard zone in the Peruvian Cordillera Blanca mountain range 40 minutes east of the city of Huaraz. In the family's garden there is a spectacular view of Andean peaks in all directions. There is a sense of being in an oasis, shielded from the noise of the street right outside the gates and the hustle and bustle of the town of Huaraz below. There is no palpable sense that Lake Palcacocha, a glacial lake fed by rapidly melting ice caused by climate change, could

Figure 1: View of the garden and animal corral in Rosa's home. Photo by H. Moulton

overflow the dam constructed to retain it and come barreling down the valley and destroy their home.

Instead, Rosa's home is a bustling site of construction, weeding, corralling animals, and hastily making school lunches. Rosa's mother and father now live in a side room off the basic kitchen comprised of a single burner, a small wooden table and a plaster sink. Rosa's sister Ernestina shares a room with her daughters, and Rosa sleeps in another room off the kitchen. Until recently, Rosa worked a demanding job at a tourist hotel in Huaraz, which she held for nearly 15 years. She left to focus on establishing her own hotel business called Hamariki Inn, which she has built floor by floor over the past five years. Hamariki now towers above the small adobe house that the rest of the family lives in. With running water, flush toilets, rooms with locking doors and large windows, and an airy kitchen and lounge area overlooking the glaciated peaks, it is clear that Rosa has thought through the needs of tourists throughout her time in the hospitality industry. She told me that she was ready to be her own boss, and that owning and running her own hotel would give her money to support her elderly parents, and additional time to help them around the house. The guests would also provide supplementary income for Ernestina, who planned to sell organic herbs that she grew in her garden to interested clients.

Figure 2: Second kitchen with a fire pit and washing station. Photo by H. Moulton

The day before, I sat at a table in the Hotel Central Sucali in Huaraz, Peru with an international team of glaciologists, hydrologists, city planners, and natural hazard specialists. As part of a project on integrated water and risk management in the Cordillera Blanca, our group's task was to work with local officials and professionals to understand the challenges to achieving sustainable water management practices and glacial lake outburst flood mitigation under the most dire IPCC emissions and warming scenario, RCP 8.5. This particular scenario looks catastrophic in the region, with all but the highest glaciers predicted to disappear within 20 years (leaving 7 km^2 compared to 900 km^2 during the Little Ice Age) which would contribute to widespread water scarcity and

access issues (Motschmann et al., 2020). Even under the most optimistic emissions scenario, glaciers would continue to shrink due to the lag in how emissions affect glacier melt (Schauwecker et al., 2017).

The mood at the table was somber and stern, with the men noting that "the local population has no environmental sensibility and does not care about flood risks," "water quality is going to continue to decline as glaciers melt and expose acidic rocks near rivers," and "the rural population is going to decrease with agriculture becoming an unsustainable way of life" (Fieldnotes: August 17, 2018). I was hearing the local population discussed as though it were a single entity, with limited conversations of different experiences of risk and climate change based on gender, and I was also hearing a pervasive sense of how inevitable this worst-case scenario was. I thought back to Rosa's experiences and wondered at the mismatch between both spaces I was involved in: the doom we discussed in the hotel with experts and the life-giving home and garden experiences I shared with the women in Rosa's family.

Figure 3: Images from the Aguafuturo stakeholder workshop, held in August 2018 in Huaraz, Peru. Photo credit: Randy Muñoz

While Rosa's experience is not indicative of the intersectional experiences of all Quechua women living in the Cordillera Blanca, I was curious about how she might describe climate-related vulnerability in relation to gender. We had used this word a lot in our expert meetings and workshops, and the GLOF literature was saturated with risk and vulnerability language, so I wanted to understand how local women would describe their own experiences. Rosa and I talked about vulnerability to climate change and melting glaciers and she looked at me quizzically as I tried to translate the word "vulnerable" into Spanish, then into Quechua. She said that she had never used this word and offered up the synonyms "worried" "stressed" and even "brave" instead. She explained that many single mothers in the area were worried about their children and their ability to provide for their families, but that they were brave in being both the mother and father for their children. I asked her if she thought about herself in this category and she shook her head, saying "For me, no. But other women, especially mothers, experience this." Indeed, Quechua women in highland communities experience unique challenges and structural sources of marginalization—including heavy involvement in informal labor, domestic violence, disproprtionate loads of carework compared to men, and until recently, limited educational opportunities (Del Aguila, 2016).

Rosa was building her hotel and changing her crops because of some of the same social and environmental pressures we discussed the previous day, including shifts in agriculture and water availability that made her family's potato farm and cattle-herding less profitable. But her view of the future was not of doom. Instead, she and the other women who my collaborator Inés and I would eventually interview for this project

described a landscape threaded with both social and environmental challenges that affected women in specific ways based on their unique life experiences but also based on shared challenges—such as increased responsibility for household food security and emotional labor. There was almost no discussion of ice loss and flood risk, despite their awareness of these issues.

Simply put, I was seeing a mismatch between our efforts at technical adaptation planning and the adaptation needs of the most marginalized people in the region: specifically, Quechua women living in peri-urban highland communities. The kind of glacier emergencies that occur in the Cordillera Blanca mean that large scale interventions like dams and flood early warning systems are major priorities. But they do not address the everyday, household level needs and desires that Indigenous women who we met and spoke with describe. The current framing of risk reduction in adaptation planning and glacier hazard management has a profound effect on how the state, researchers, and NGOs view the everyday adaptation experiences that Rosa described. Through my experience working on the Aguafuturo project, I saw that everyday adaptations are often seen as diversions from a longer term and more structured plan for adaptation and risk management, or through the lens of a deficit model, where people need to be "sensitized" to risk and educated. And the people who are most often associated with the everyday are Indigenous women, who are frequently engaged in subsistence activities that 'must be protected' from climate related risks. In reality, it is everyday forays into embodied uncertainty, creativity, play, trial and error, and failure that constitute local knowledge and make successful adaptation possible. Without

considering these processes, adaptation planning worldwide will not be responsive to the needs of the most systemically marginalized people, in this case, Indigenous women.

Climate change and ice loss are therefore always in the background of my work but are not the singular focus. Following this, my research asks two questions:

> 1) How do Indigenous women characterize their experiences of adaptation in regions where melting glaciers are creating climate-related physical hazards? and
> 2) How are gender and Indigeneity leveraged by Indigenous women's organizations and the state in national level adaptation planning, and what are the claims that Indigenous women and the state make through this process?

The implications of this are widespread, because they shape the types of programs that are designed and implemented at the national level through the subnational level, and whose adaptation futures will be enacted and supported long term.

Place and Context

This study centers Indigenous women's practices of everyday life amidst environmental change in a globally renowned disaster zone: the Cordillera Blanca mountain range in the Central Peruvian Andes. The region is internationally famous for glacial lake outburst floods (GLOFs), which occur when glacier meltwater fills up glacier lakes beds, causing large amounts of lake water to overtop dams or their natural moraines and destroy towns and livelihoods in the valley below (Carey, 2010; Emmer et al., 2020).

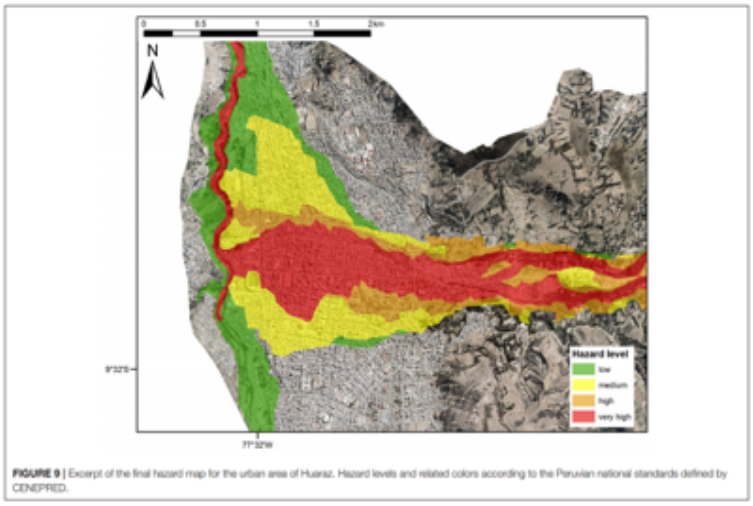

Figure 4: Model of GLOF hazard levels in Huaraz and surrounding areas from Frey et. al. 2018

Water scarcity is also increasingly uncertain both seasonally and annually. As the rainy season becomes unpredictable due to climate change, glaciers provide less input to rivers, and access to water remains mired in political and infrastructural challenges (Guittard et al., 2020; Motschmann et al., 2022). As such, the region has been a hub of domestically and internationally funded and supported technical adaptation measures designed to mitigate flooding and water scarcity. Icy environments are potent places to study issues of inequity and justice. Under the spotlight of climate change, tropical glaciers in the Andes have been labeled dangerous, fragile, and ephemeral and the populations living below this ice have been doomed and damned along with them (Moulton et al., 2021). In the Cordillera Blanca, melting glaciers caused by

Figure 5: Glacial Lake Palcacocha with siphons installed to lower lake level. Photo by H. Moulton

anthropogenic climate change have led to jockeying over shifting water supplies, changing landscapes of tourism, and shifts in livelihoods that disproportionately affect those without the power to control the changing flows of money, material resources, water, and other materials. For example, there are nearly 300,000 people who live in the valley, over 2/3 of whom live in rural spaces outside of the regional capital city of Huaraz or other cities (*INEI*, 2018). Land grabbing and conflicts over resources like mining mean there is very little extra land for these rural residents, and large swaths of land are dedicated to conservation through Huascaran National Park (Rasmussen, 2019).

The Cordillera Blanca has experienced devastating floods, landslides, and increasingly common episodes of water scarcity throughout the past 100 years as a result of climate change induced ice loss (Carey, 2010; Stuart-Smith et al., 2021; Wegner, 2014). But these floods and the impacts of melting ice affect people in unequal ways. In order to uncover this inequality, researchers and policymakers need to pay careful attention to the social and environmental context that marginalized populations like Quechua women experience, in addition to questioning longstanding assumptions about risk. For example, vulnerability to floods has shifted from richer to poorer areas over time (Carey, 2010), and highland communities area affected differently by climate change and ice loss based on location, class, gendered divisions of labor, and tourism, among other issues.

The Cordillera Blanca is also a regional hub for tourism, with many men working in mountain guiding and trekking, and many women working in hospitality, like Rosa. Tourism in Huascarán National Park and Biosphere Reserve, a protected area that covers

340,000 hectares in the Cordillera Blanca, has also been increasing. The number of non-domestic visitors to Huascaran National park more than doubled from just over 30,000 visitors to 90,000 visitors, bringing with it the demand for hospitality and services like guided tours to the surrounding mountains and lakes (Branca & Haller, 2021). This brings a large source of income for residents in the region who work in hospitality. But this is also an uncertain source of income, since issues like COVID and national political struggles can quickly shut off the tap.

In order to better understand the experiences of Quechua women at the local level, it is also important to trace the use of gender and Indigeneity in adaptation planning at the national level. Peru has positioned itself as a leader in Latin America in terms of climate change adaptation planning, mainstreaming gender into climate change policies, and increasing the representation of women and Indigenous people in adaptation planning. In 2019, the Peruvian Ministry of Environment initiated the process of creating a national adaptation plan (NAP), which provided me with the opportunity to follow the state's attempts to mainstream gender and interculturality into planning, as well as a forum to follow Indigenous women's organizations demands as they are increasingly centered. The majority of the process of finalizing the NAP was held online as a result of COVID, which meant that there were many webinars, press conferences, and workshops that detailed the positions of both the state and Indigenous women's organizations in relation to climate change adaptation. The plan was set to transform how gender is mainstreamed into adaptation projects at all levels, but political uncertainty in Peru has waylaid many of the policy efforts put forward by previous administrations. Peru's president was recently

impeached, which was part of a series of presidential impeachments and resignations that has caused constant leadership shifts within the Ministry of Environment, the organization responsible for implementing and facilitating the NAP. As such, uncertainty in national-level politics will continue to be a source of instability for local level climate policies and implementation plans.

Key Findings and Contribution to the literature

The following section details the scholarly conversations that my work contributes to. In addition to these contributions, my work is in dialogue with decolonial climate change studies (Gómez-Barris, 2017; D. E. Johnson et al., 2021; Sultana, 2022), which does not exist as a stand-alone category in this section. Rather than framing my work as contributing to decolonial studies, I instead emphasize that a decolonial approach is necessary to achieve transformative climate adaptation that centers the lives of Indigenous women in the Andes.

Interdisciplinary climate change research in the regional context

In the Santa Valley of the Cordillera Blanca, where my research was conducted, Quechua women living in highland communities are often erased from research and testimony about the impacts of climate change and melting glaciers in the region. Instead, there is a focus on ice loss and water scarcity first and foremost, and researchers note that daily life is frequently only considered through the lens of climate, rather than seeing climate as one among a series of factors that affect everyday life (Carey et al., 2017,

2021; Haverkamp, 2021; Rasmussen, 2016). This excludes the constellation of factors that affect adaptive capacity and vulnerability to disasters and risks throughout the course of a day and even a lifetime, especially for groups of people like Quechua women who are politically disenfranchised by the dominant power structures in Peru. The problem with this focus on emergencies is that in the effort to address possible catastrophe, groups of people living in exposed geographic areas are largely seen as vulnerable units rather than communities of individuals with unique identities and views on environmental uncertainty.

Recently, there has been more research that focuses on water, changing wetlands, and local perceptions of climate change that seeks to center community voices and demands (Julca, 2018; Walker-Crawford, 2019; Zimmer et al., 2022). Studies that do consider power in the region's local contexts propose integrated bottom-up and top-down approaches for managing proglacial landscapes (Zimmer et al., 2022) as well as paradigms for recentering community-based, feminist, and decolonial climate research (Haverkamp, 2021). This community-centered and transdisciplinary work considers the science-policy interface within disaster management, coupled human and biophysical modeling of glacier and water changes, climate attribution, and the relationship between local perception of environmental change and shifts observed with technology (Carey et al., 2017; Drenkhan et al., 2015; Monge-Rodríguez et al., 2022; Motschmann et al., 2020; Stuart-Smith et al., 2021; Vuille et al., 2018). Despite this robust focus on shifting research out of the realm of purely biophysical risk, there are still very few studies that

center both the lives of women and feminist approaches to climate change adaptation simultaneously within the regional context.

My research further develops the claim by scholars like Huntington et al (2019) that a singular focus on climate change reinforces colonial power structures, and that attention to collaborative research can better address the fullness of life's challenges and opportunities for Indigenous peoples adapting to climate change. I center the testimony of Quechua women and also consider the power dynamics that lead to a regional focus on technical solutions to climate hazards above the daily lives of most of the people, regardless of gender. This is the first study in the regional context to do so, and the first body of work that links Indigenous women's adaptation demands at the national level with local scale adaptations.

Contextualizing vulnerability beyond climate and glacier disasters

My work focuses on two conversations in the critical climate change adaptation and vulnerability literature, which span several fields in the qualitative social sciences: 1) Questioning homogenous labels of vulnerability based on unfounded, outdated, racist, or sexist assumptions, and; 2) Accurately contextualizing the social and environmental challenges faced by minoritized communities who have been structurally undermined by racism, sexism, systemic poverty, political corruption, and capitalism.

Vulnerability to climate change is always political. As a discursive term, vulnerability may be deployed in an effort to convince decisionmakers to pay attention to specific minoritized groups (Dewan, 2021; Mikulewicz, 2020a). But it also often erases

the agency and knowledge of marginalized groups and creates a corollary narrative of urgency and helplessness that justifies interventions on behalf of marginalized populations (Anderson et al., 2019; Goh, 2019; Paprocki, 2019). Researchers have shown the importance of carefully examining local power structures and political inequalities that affect how diverse groups of people will respond to and benefit from adaptation interventions (Marino, 2018; Nagoda & Eriksen, 2014; Nightingale, 2017; Nightingale et al., 2020; J. C. Ribot, 2011). However, scholarship that addresses how adaptation works on the ground is still largely limited (as shown by Arctic scholars like J. D. Ford et al., 2015; Huntington et al., 2019), and is particularly limited in terms of analyzing local power structures, such as gender dynamics, which can lead to either maladaptation or the redistribution of risk, often towards groups of people who are already severely marginalized (Atteridge & Remling, 2018; Juhola et al., 2016; Mills-Novoa et al., 2022). This study builds on efforts to re-politicize adaptation (S. H. Eriksen et al., 2015; Marino & Ribot, 2012) by paying attention to the daily adaptations of people who are erased by large-scale disaster risk reduction and management strategies (see paper 1).

Quechua women living in rural, highland communities are among the most structurally marginalized people in Peru (Babb, 2020; de la Cadena, 1995; Hernández Asensio et al., 2014) and are often labeled "triply vulnerable" to climate change as a result (*ILO*, 2017). Despite this ongoing and active marginalization, the label of vulnerability has become all-encompassing or homogenizing (Arora-Jonsson, 2011a; Ravera et al., 2016) and often fails to precisely capture the intersectional and diverse

experiences of Quechua women's daily lives. As a result, this research responds to the call to contribute more empirical studies in the climate adaptation literature that address the contours of lived experiences and *contextual* vulnerability rather than assuming that vulnerability is a *static* and predetermined outcome of being marginalized. It also resists the too-simple and too-quick move from vulnerability to empty narratives of resilience and empowerment, which is rarely accompanied by a commensurate level of support and care (Enarson, 2012; ERIKSEN et al., 2011; Nagoda, 2015; Nightingale et al., 2019).

Climate change is a powerful discourse that alters expectations of causality (Dewan, 2020; Klenk & Meehan, 2017; Nagoda, 2015; O'Brien et al., 2007). When it is deployed in qualitative research, it can lead to a biophysical-focused model of adaptation that does not meaningfully address underlying social structures beyond climate (Carey et al., 2017; J. Ribot, 2014). Bassett and Fogelman (2013) noted a decade ago that only a small percentage of the adaptation literature addresses the social roots of vulnerability in order to adapt to climate change in ways that transform existing structures of social marginalization, rather than simply making incremental adjustments or focusing on the physical environment. The adaptation literature has since shifted away from the biophysical-focused model of vulnerability critiqued by scholars like Blaikie et al. (2005), but has yet to *consistently* "ask the right questions" (Ensor et al., 2019) in order to meaningfully center the lived experiences of populations who have been labeled vulnerable.

My work takes up this mantel by decentering climate change and considering it to be among a bevy of different issues that affect women in the region. In the Cordillera

Blanca, for example, vulnerability is fundamentally tied to socially produced inequalities that may have nothing to do with ice, such as land availability and differential access to social services. Through the process of decentering climate, my intent is not to deny climate change, but to show the risks of overly focusing on this at the expense of everyday life (from paper 1). The end result of prioritizing work that consistently addresses local experiences of social and environmental reality would be to create policies that change the sources of suffering and support the desires of women that were uncovered in this research.

Feminist adaptation studies: recentering the everyday, power, and Indigenous women

Contextual vulnerability can be addressed through feminist research that centers power differences at multiple scales, but especially at the local and household level. It is at the scale of the household and daily life that the negotiation between social and environmental conditions unfolds in detail and reveals the priorities of Indigenous women in concrete rather than abstract ways. As such, this study starts from the feminist position that the household is actually a microcosm for understanding power relations reflected in wider communities and networks of care, even up to the international level (Andersen et al., 2017; Bee et al., 2015; Buechler, 2016; Dyck, 2005; Nagoda & Eriksen, 2014). In paper 1, I argue for a feminist take on adaptation that centers Quechua women's futuremaking practices in order to take an intersectional view of climate related vulnerability and to drill down from emergency to lived experiences of the most marginalized (Amorim-Maia et al., 2022; Kaijser & Kronsell, 2014; Mollett & Faria,

2018). It is critical to pay close attention to the lives of Quechua women, whose lives do not register within the dominant framework of understanding environmental change in the region—that of emergency, ice loss, and disaster. A feminist lens of adaptation takes a situated view of lived experiences and how Quechua women navigate uneven power relations (Babb, 2020; de la Cadena, 1995; Iniesta-Arandia et al., 2016; Ravera et al., 2016; Weismantel, 2001).

I am attentive to the fact that gender does not solely exist in the binary, which would erase the gendered experiences of the thousands of Indigenous people in Peru who do not identify as men or women (*Promsex*, 2023). Moreover, gender is always co-produced with other forms of difference, meaning that race, class, ability, and place always affect how gender is lived out and experiences (Crenshaw, 1990; Mollett, 2017; Mollett & Faria, 2013; Thompson-Hall et al., 2016; Yuval-Davis, 2006). Climate change adaptation planning in Peru, however, is often presented within the traditional men-women binary, with gender-responsive adaptation planning typically geared towards women or set up to compare the experiences of women to the those of men (MINAM, 2021). This study responds to calls in feminist political ecology to avoid the overly simplistic "add women and stir" approach to studying environmental change (Carey et al., 2016; Dyck, 2005; Elmhirst, 2015; Mollett & Faria, 2013). Instead, I take a feminist approach to climate adaptation studies by paying attention to gender, everyday life, marginalization, resource control, intersectional differences, and power structures embedded in adaptation planning, which disproportionately affect Indigenous women in Peru, both across the country and within my field site. Misreading women purely as

victims of climate disaster and emergency as a result of their gender reproduces the stereotype of all women—regardless of other axes of identity— as vulnerable, poor, and in need of external aid to survive yet another existential crisis (Nagel, 2012; Wester & Lama, 2019). Indeed, Indigenous women's suffering is often highlighted more than their efforts to create better lives for themselves and their families, for example within the legacy of gender-based violence in rural communities during the Peruvian armed conflict (Suarez, 2013).

Although the lives of Quechua women in diverse geographic regions of the country are multifaceted and there is no single experience of being a Quechua woman, the shared history of gender and race-based discrimination that targets Indigenous women in the country dates back to colonization and is still deeply embedded in both national and local politics (Rousseau & Ewig, 2017; Rousseau & Hudon, 2016) including climate adaptation policies. ES Huaman (2019) notes that, "Quechua women's labor, rights, bodies, and intellects have been controlled and restricted for the purposes of maintaining coloniality and state power." This exploitation and control extends to climate change adaptation, where Indigenous women, particularly in the highlands, are championed as seed savers and the guardians of traditional agriculture (F. Castro, 2022; "Mujer rural," 2020), all the while being systematically undermined by continued mining projects, dispossession, political corruption, violence, and the construction of narratives of poverty and backwardness that justify interventions without women's consent or involvement (Forstner, 2013; Silva Santisteban, 2017). The International Labour Organization notes that, "Being rural, indigenous and, in addition, a woman increases the probability of

being poor in Peru" (Del Aguila, 2016) and poverty is often used as a justification for adaptation interventions without understanding the specific and varied ways that gender and Indigeneity shape adaptation prospects in any given community (Nelson et al., 2016).

Feminist scholars have shown how resource conflicts and access are mediated materially and emotionally (Sultana, 2011), particularly through studies of gender, power, and water (Elmhirst, 2015; Sultana, 2021). This also extends to labor and climate change and shows how systemic marginalization can continue while the state can claim increased participation of Indigenous women in climate change adaptation planning efforts. My research shows how livelihoods, local economies, and resource conflicts extend to climate change adaptation and the disproportionate share of labor that Quechua women shoulder in order to adapt (see paper 3) while still being structurally undermined through maladaptive practices like mining and large-scale industrial agriculture (see paper 2).

Finally but significantly, women center their bodies in futuremaking and in national adaptation planning through conversations about reproductive issues, death, relations with other-than-human beings, illness, health symptoms, food, medicine, and emotions, which Indigenous women frequently connect to environmental issues (Moreton-Robinson, 2013; Perreault, 2013; Radcliffe, 2015; Zaragocin & Caretta, 2021). Therefore, futuremaking within the context of adaptation is felt, directly experienced, and subjective, such as increasing heat and cold affecting women's joints as they work outdoors (see paper 1) or mining tailings poisoning the bodies of Indigenous women even as other sources of water become less available due to climate change (see paper 2). Futuremaking and Indigenous women's activism at the national scale makes embodiment

legible to the state, researchers, and NGOs who might otherwise ignore this gendered issue. The approach of embodied uncertainty also provides an alternative to the more analytic, model-based, disembodied approach commonly used by researchers focused on technical adaptations (Scoones & Stirling, 2020; Sword-Daniels et al., 2018).

Power and transformational adaptation for Indigenous women: when business as usual is violence

Transformational climate change adaptation—which seeks to transform existing structures of marginalization through the adaptation process— is the aspirational end result of questioning homogeneous labels of vulnerability, centering local voices and power structures rather than technical and de-politicized adaptation interventions, and prioritizing the demands of historically marginalized people like Indigenous women. There are three questions that are important to consider in this field: What does it mean to be transformational? How do we achieve it? and, What happens if we forego transformative change? (S. H. Eriksen et al., 2019; Holland, 2017; Holler et al., 2020). To address these issues, I ask about the work that gender and Indigeneity do in national adaptation planning and how this affects power in climate policy from the national to the local scale. In addition, I ask what the stakes are in maintaining the status quo. To accomplish this, I am primarily in dialogue with critical climate change adaptation studies within geography, and particularly scholars who are assessing transformative adaptation that redresses historical inequities created by the global economy, colonialism,

or sustainable development (Bentz et al., 2022; Blythe et al., 2018; S. Eriksen et al., 2021; Kates et al., 2012; Leichenko & O'Brien, 2019).

In terms of policymaking, Atteridge and Remling (2018, p.1) note that "Concerns about 'maladaptation'… are mentioned on the margins but do not significantly influence the way adaptation choices are made or evaluated by policy makers, project planners or international funds." I focus on the idea of *shifting* vulnerability within maladaptation (Barnett & O'Neill, 2013; Juhola et al., 2016; McEvoy & Wilder, 2012) wherein adaptation policies and management strategies that are meant to decrease flood risks for entire communities end up conflating the experiences of all people in affected or at-risk geographic areas. At the national level, I find that efforts to address different vulnerable populations in adaptation planning—through a focus on gender, intercultural issues, and intergenerational welfare—refuse to address issues like mining and industrial agriculture. Mining specifically undermines the adaptive capacity of Indigenous women, while it is touted as beneficial for the Peruvian population at large due to the high demand for copper, silver, and zinc in the global green economy transition (World Bank Group, 2022).

I address the barriers and opportunities for transformative adaptation through the experiences of Indigenous women at both the local and the national level. The national-level component of this study (paper 2) aims to understand the ways that structural power relations—especially related to gender and Indigeneity— are challenged or reinforced through national climate change adaptation planning. I conducted an empirical study that shows the potential for transformative adaptation if Indigenous women's demands and

lived experiences are met with concrete policy support, and the potential for maladaptation and increased vulnerability if this process of ignoring women's lived experiences becomes more entrenched. In combination with my case study work in the Cordillera Blanca, my research shows that adaptation planning efforts that fail to consider the everyday lives and political priorities of marginalized populations, such as Indigenous women in Peru, will lead to maladaptive outcomes by failing to address issues like mining, failing to support women's everyday adaptations like home gardening, and continuing to prioritize technical interventions over "soft" interventions that support flourishing lives.

I show that by including gender and interculturality in adaptation planning at the national level, the state bolsters its standing as a leader in transformative climate change adaptation planning in Latin America, while simultaneously rendering invisible the actual demands of marginalized populations like Indigenous women. This also depoliticizes Indigenous women's demands for territorial sovereignty based on their embodied connection to land, since gender is not framed in connection to sovereignty in state-led adaptation planning, and is only connected to land titling through the outdated lens of gender parity. It's therefore necessary to keep the *political* nature of climate change adaptation front and center in order to resist the discursive depoliticization that sanitized efforts at gender mainstreaming and culturally-appropriate adaptation planning can often invoke (Alston, 2014; Mikulewicz, 2020b; Scoville-Simonds et al., 2020).

I find that the NAP represents an extension of adaptation and development as usual in lieu of transformative change, meaning that it fails to address the inequities

perpetuated by sustainable development initiatives—such as working with the World Bank to develop initiatives that undermine the capacity of Indigenous women under the guise of reducing poverty. Indigenous women are therefore held up as resilient, model adaptation subjects who are the guardians of Mother Earth. The state then promotes a gendered and racialized model of resilience that they then undermine by ignoring demands for sovereignty that would stop extractive activities on Indigenous women's lands and therefore allow them to adapt as they see fit. This amounts to discursive violence (Picq, 2018; Sultana, 2022; Valdivia, 2020) which compounds the already rampant physical violence committed against Indigenous communities and women (*FIDH*, 2021) – who are routinely killed for their activism, poisoned by mining on their territories, and ignored when they call for public policies that would protect the bodies of Indigenous women and Mother Earth as one and the same.

Positionality and Methods Reflection

This section details key methodological choices and adjustments that I made throughout the research process. It also includes reflections on these choices, the process of conducting fieldwork, and my positionality as a white, woman-identifying researcher from an institution in the Global North. The methods themselves are included in each individual section of the dissertation. Importantly, the COVID pandemic shifted my research plan entirely: from a comparative study of women's experiences of adaptation in the Cordillera Vilcanota and the Cordillera Blanca, to a collaborative ethnographic project on the Cordillera Blanca and an analysis of the politics of gender and Indigeneity

in national scale adaptation planning. Peru had the highest per capita COVID 19 death rate in the world. The country was effectively shut down with limited opportunities to travel from March 2020 to January 2022. As a result, I had to shift my plans to do long term in-person ethnographic work in Cusco and the Cordillera Blanca to single field site work, which involved working with a collaborator in the Cordillera Blanca to conduct in-depth interviews with women. I detail both my place-based and remote research reflections below.

* * * * *

My first visit to the Cordillera Blanca was in 2010 as a tourist, determined to hike to the famed sky-blue glacial lakes that peppered the Santa Cruz hiking trail in the Santa Valley. I was living in Lima at the time for a semester abroad and I experienced the region in the same way that most foreign-born visitors do: I was deposited in Huaraz after a sleepy overnight bus ride through the Andes, I spent one night at a cheap hostel in the city, followed by four days photographing glaciers and fighting altitude sickness under the famed peaks of the Andes, only to turn around and take the first bus out of Huaraz and back to Lima the day following our trek.

When I returned in the summer between my master's and doctoral work, I recognized the architecture of many parts of the city, but knew nothing of the people, the food, the culture, and the lives of the men and women who live outside the city itself. In fact, I did not even remember that 28 de Julio, Peruvian Independence Day, is a terrible

time to try to find lodging. Much of the country is on vacation on 28 de Julio, and many Peruvians who can afford to leave Lima and other crowded cities to escape to the mountains or the beach. Leaving my plans until the last minute resulted in limited access to hotels in the entire valley, nevermind in Huaraz itself, where I was supposed to be launching my research into the societal effects of risk, ice loss, and glacial lake outburst floods. I had managed to secure a hotel for the first few nights of my stay and, exasperated, I approached Rosa, the woman who appeared to run day to day operations at the hotel for advice on the next week of my stay. "Could I sleep in the common room?" I requested, worried. She adjusted her hat, looked out the window towards the mountains, and clacked her tongue against her teeth, saying nothing more for a long time. Finally, she told me "you can take a tent and go sleep outside my father's hut in the mountains" then laughed as my mouth fell open.

While I ended up finding lodging in the city, I would come to know Rosa, her family, and their land in the *puna* (highland plains) well enough in the coming years to consider it my home away from home. The women in the family, along with their friend Solano the taxi driver and Rex the dog, would become my closest friends, guides, and protectors. It is to them that my work is accountable, and it is the voices of women like Rosa, her sister, and her mother that I foreground in this work. I spent countless hours in conversation with Rosa and her sister Ernestina, hiking through the mountains, chasing sheep, harvesting potatoes, vaccinating cattle, and hauling donkeys out of wetland mud with the family. Rosa and Solano personally took me up to Lake Shallap and Lake 513, two glacial lakes that were being monitored for GLOF risks. Their accompaniment was

invaluable, and helped me to learn more about the landscape and what it means to women in the region than traipsing along in a tour group could ever have done. When I was ill from eating *pachamanca* (earth-smoked potatoes) from a street vendor, Ernestina's daughters brought me a bucket and a washcloth. When my stomach hurt from altitude, as it always did the first week of my visit, Rosa mixed together stomach soothing herbs like *muña* (Andean mint), chamomile, eucalyptus, and *hierbabuena* in a piping hot French press and told me to drink the whole thing. When I was going deep into the Cordillera Huayhuash alone and was silently wracked with anxiety, Rosa lent me her extra cellphone and told me to call her anytime, day or night. When I returned twice from the Huayhuash, unable to sustain the physical, mental, and emotional toll of the deeply isolating work I had embarked on there, Rosa made space for me on the couch next to her. We watched Spanish language soap operas silently, side by side, and I was never so grateful for the presence of a true friend.

I learned three important things from this early fieldwork, which I detailed in my fieldnotes during the summers of 2018 and 2019: 1) group interviews and walking interviews (Jones et al., 2008) would be necessary for some women to feel comfortable talking to me, 2) accompaniment by a trusted local woman would be key for deepening reciprocal trust with people and sustaining challenging fieldwork, and 3) women are very interested in talking about their life experiences, which contradicted the stories I heard that women rejected the very idea of talking to researchers or deferred to the men in their lives.

* * * * *

Solano's car puttered up the steep, gravel-covered slope at the very top of the road, spewing a voluminous cloud of smoke that blocked the view of the road ahead. We were heading to the Shallap Valley in the Peruvian Cordillera Blanca in his 1980s taxi cab, which had balding tires and required periodic stops to splash the engine with cool water from the nearby glacier-fed river. As the car stumbled back to life, Rosa, whose farm we were going to tend to, gently chided Solano about his ancient vehicle and its "problemas" as Solano's black cat ornament swung wildly on his rearview mirror, in time with the bucking vehicle.

We eventually stopped to pick up two women who were waiting on the side of the narrow dirt road that we were navigating. Soon I was sandwiched between them. Both had their supplies for the day wrapped in colorful cloth blankets and wore tall brown hats with embroidered handkerchiefs draped over the brim to protect their faces from the sun. "The sun is stronger up there than it used to be" one woman said to me, noting my bare head and clearly sizing me up as a hiker. "Are you going to go to Lake Shallap?" Shallap is an increasingly popular tourist destination, a beautiful glacial lake that has been managed for flood risk for decades by the Peruvian government. When I told her I was actually going to help Rosa bring the cows from the high valley farm to a lower location, she laughed and started talking to Rosa in Quechua. I can only assume she was confused about why a hiking-gear clad gringa was going to herd cows at 13,000 feet. Rosa shrugged and said to her in Spanish "She said she likes to follow me through the mountains, so here we are."

This story from my fieldnotes illustrates the types of experiences that marked the place-based portion of my research and fieldwork. In order to better understand the lives of Quechua women in the region and how they navigate social and environmental changes, I participated in daily life with as much of an open mind as I could, constantly tacking back and forth between observational mode and a sense of just being in this space with people I was becoming closer to. I conducted several walking interviews and intended to do many more before COVID hit and changed my research plans.

My preliminary fieldwork in the summer of 2018 showed that traditional ethnographic methods like participant observation and interviews did not address the complexity of lived experiences of environmental change in my field site. For example, some women would respond to initial questions with stock phrases that reflected the government narrative of climate change in the region. Later, they would tell me they actually did not believe what they had recited from the official narrative because they had seen no evidence in their own lives. During one interview in particular with a woman named Carmen, I carefully set out my recorder, read off the consent form that the University of Oregon's Institutional Review Board required me to provide, and began to read my pre-determined list of questions. My field notes show that I was buoyant and excited to start the interview at first:

When Carmen came out of her house she took her time making her way over to me. Then she looked at me and smiled and immediately began pulling ears of dried corn off the strings that she had hanging outside of her house. I thought their pale husks were

beautiful, all sun dried and brittle. They made her house stand out from others in the neighborhood. It had flair and a little bit of style, in addition to being functional. In any case, she acknowledged me briefly, laid down half a plastic sack on the ground, then began to lay the ears of corn on top of the sack. All the while she was speaking Quechua with our mutual friend Ernestina in muffled tones punctuated with giggles. I asked her if she needed help, and she said sure, so we took down two lines of corn. Then she sat on her stoop and I sat in a baby-sized, red wooden chair, while Ernestina sat on the corner of the stoop and crocheted, and we began our interview. (Fieldnotes: September 4, 2019)

Not more than five minutes later, Carmen clammed up, providing no more than a sentence-worth of details for each of my 15 questions. The rest of the interview was awkward at best. As I perched on the child's stool, one leg slowly falling asleep, Ernestina mostly spoke for Carmen and many questions elicited one-word responses. Slightly frustrated, I turned off the tape recorder and started shucking corn instead. Carmen slowly started asking me questions about my life and my family as her three-year-old son fed me graham crackers dripping with honey. I learned more about Carmen's life with the tape recorder off than I ever could have from the highly formal process that I constructed in my office in Oregon. It was clear to me that I needed to conduct more unconventional interviews and conversations and share details about my own life in order to earn the trust of those I was asking to participate in my study.

At the beginning of the pandemic, I attempted to coordinate phone interviews with women in the Llupa and Unchus region, assuming that the lockdown would last far less than a year. I paid Rosa to act as my research coordinator, and she set me up with

five interviews in October and November 2020. Several of these interviews were with her family members, which allowed me to test technology, ensure questions were understandable, and spend time sharing details about me and my life to facilitate trust and a two-way conversation, which worked so well on the ground. These interviews were spectacularly difficult. Wi-Fi in the high Andes is notoriously absent and access to data through cellphone networks literally comes and goes with each passing storm cloud. I greatly enjoyed these conversations and connecting with people while I could not travel. But I realized that this method would not work for the kind of in-depth, intimate, detailed interviews about daily life that I was imagining. I ultimately thought of these interviews as context and relationship-building rather than the core of my qualitative data.

In order to adjust my plan, I worked with Inés Yanac León, a fluent Quechua speaker from the town of Recuay in the Cordillera Blanca, to facilitate on-the-ground interviews in a safe way. I was referred to Inés by Noah Walker-Crawford, who has conducted extensive anthropology fieldwork on the region on glacier hazards and climate justice (Crawford-Walker et al., 2018; Walker-Crawford, 2019). Inés has worked on many projects related to glacial lake outburst flood awareness, local perceptions of climate change, health, and gender in the entire Santa Valley. She has completed requirements towards at a doctorate at the Catholic University in Lima and also has a keen awareness of many of the social and environmental issues that are currently affecting women in the region, as well as how they have changed over time. In order to work with Inés, I secured funding from a collaborative project with the University of Zurich, which meant that I also needed to work with a master's and doctoral student in

the geography department at Zurich in order to develop a relevant set of research questions for their work. This joint funding and collaborative interviewing added another layer to the process, since it required that I add questions to my interview that directly addressed climate change and the local impacts of flooding and water scarcity, despite the fact that I was *actively decentering* these topics in my own research. This highlights many of the challenges of funding ethnographic and unconventionally structured qualitative work in academia. In order to access flexible funds to pay Inés at a fair rate, I worked with a Swiss team who had access to this funding and a longstanding history of important and respectful work in the region. At the same time, I needed to change my interview structure and creatively address the fact that the kind of interview I had imagined in my mind would need to be reworked for the benefit of the team.

Ultimately, Inés and I had several phone calls to edit and re-arrange the interview questions so that women would feel comfortable talking about their lives first (to address my research questions) and climate second (to address the adaptation questions from UZH). I wrote the first draft of my questions and added the UZH questions to the end. Then, we went back and forth by email, Whats App messaging, and phone in order to edit the questions for ease of understanding and to facilitate translation into Quechua, which we correctly assumed would be the preferred interview language for most women. After Inés conducted three interviews, we dropped several questions about health upon her recommendation (health as a topic was being drawn out through other questions), rearranged other questions to add to the flow of conversation, and added a specific

section on livelihoods and land tenure based on interesting anecdotes in the first three interviews.

In listening to all of the transcripts in Spanish as I transcribed them, I was enormously grateful for Inés' willingness to listen to each interviewee, tailor questions to their level of understanding, and clarify information and wording that might be unfamiliar to me (for example, by using alternate words when repeating a word or phrase that the interviewee used). Although I took a year of academic Quechua and speak Spanish nearly fluently, the contrast between the discussions I was able to have in the phone interviews I conducted early-on and the interviews that Inés conducted was readily apparent, and this research is far better for having her centrally involved. This collaborative work with an Indigenous research partner helped me to better situate my analysis within a decolonial, feminist understanding of climate change in the region (Buechler et al., 2015; Valdivia, 2020) and forced me to reckon with the boundaries and coloniality of my academic training (David-Chavez, n.d.; Liboiron, 2021), my privilege (Caretta & Jokinen, 2017; Faria & Mollett, 2016), the politics of representation when working with Indigenous communities (Smith, 2013), and the limitations of research that is purely analytical rather than responsive and oriented towards change (Speed, 2006).

It was sometimes difficult to match the speed required for me to finish my doctorate on time with the pace of work under COVID conditions in the Andes. It was simply not possible for Inés to dedicate multiple days at a time to organizing and conducting interviews, shopping for gifts of hand sanitizer and fruit (as Inés suggested to me), re-organizing interviews that fell through, and transcribing all of the interviews in

Quechua that I could not understand. Additionally, I felt a responsibility to pay Inés a wage that would be comparable to the high-level and professional interviewing she does for the Peruvian Ministry of Health, for example. I asked her what this rate was and cross-checked it with several colleagues to see if I needed to raise it further, aware that culturally it is not common for Peruvian research assistants to demand high wages of their partners in the Global North. I ultimately supplemented the amount that Inés would receive from UZH in order to reflect the time she spent carefully transcribing interviews and working with care in the pandemic environment. This type of labor and compensation for it should be foregrounded in discussions about doctoral fieldwork. It was difficult and time consuming to find funding that could be used as compensation for a local research assistant in an international setting, despite the fact that Inés' contribution was absolutely pivotal to my dissertation.

Finally, my work on gender and Indigeneity in the national adaptation planning process (NAP - paper 2) was multifaceted, challenging, eye-opening, and entirely new to me. When it became clear that I would not be conducting long term fieldwork in the Cordillera Blanca, this focus on the national adaptation planning process became much more important than I had originally planned. I began by following press releases and announcements about how participatory the NAP would be, how it had a deliberate focus on gender and interculturality, and how Indigenous women's organizations were responding to these calls for their voices to be included. I sat in on live webinars, accessed recorded webinars organized by the state, NGOs, and Indigenous women's organizations, and combed Twitter, institutional websites, blogs, newspaper articles, and

YouTube to understand the demands of Indigenous women in adaptation planning as compared to state and NGO framings. This dragnet process felt both unsystematic and entirely too thorough. I went through multiple rounds of grounded coding, watched webinars several times, and ultimately realized that I could not stick to analyzing information that was only formally part of the NAP process. If I had done this, I would not have heard the demands of Indigenous women's organizations, despite the fact that this NAP was ostensibly designed to be especially inclusive of their voices for the first time. As a result, I widened the net further to include where Indigenous women were talking about gender and climate change outside of the formal adaptation process, mainly through blog posts, workshops, and social media.

When I was finally able to return to Peru in June 2022, most of the city of Lima was still working remotely, but I was able to organize and conduct two interviews with high-level leaders of Indigenous women's organizations (for paper 2), as well as to visit and conduct archival research at the Flora Tristan feminist library in central Lima (for paper 3). A national transportation strike over the prices of gasoline, fertilizer, and basic necessities had paralyzed the Pan-American highway and several other major roads across the country, preventing me from accessing the Cordillera Blanca. I was steeped in the chaos of a rapidly changing national political environment that was causing a sharp increase in inequality (*Rising Strong*, 2023), much of which compounded with the effects of the pandemic to affect Indigenous women in a disproportionate way. This is because Indigenous women often work in the informal sector, are in charge of household

food security, and already bore the burden of pandemic-related carework and changes to their livelihoods (ONAMIAP, 2022).

I saw how compounding crises were only *further marginalizing* Indigenous women, whereas all the rhetoric I heard online from my home during the pandemic was about trying to increase *participation* and *equality.* For example, one day in Lima I ran into two women with infants who had recently arrived in the city from Junín in the Andean highlands. COVID, changes to agriculture and livelihoods as a result of water shortages, and family ties had brought them to the city. As we passed tourist shops on José Larco street in the upscale neighborhood of Miraflores, they told me that diaper and formula prices had risen so precipitously that they were unable to feed their babies consistently, whereas six months ago they did not have this problem. As we walked into a local pharmacy I was shocked at the formula and diaper prices. I bought two tubs of formula and two packs of diapers for nearly 600 soles (about $150 USD). Although I never imagined my time spent in Lima would be anything more than a pass-through on the way to the mountains, I am grateful for this detour. Standing on José Larco with my arms full of diapers and infant formula, I hugged the women I had just met and pocketed the two cherry lollipops that they offered me, then returned to my apartment in a melancholy fog. I sat silently for a while and turned over the words that Melania Canales, the leader of the country's largest Indigenous women's organization, had recently told me: that it is simply not enough to do research. This situation *has* to change.

Overview of the Dissertation

In **Paper 1**, I use a case study in the Cordillera Blanca mountain range to advance a feminist, decolonial framework of everyday adaptation called 'futuremaking' that challenges the current ice-and-water-focused paradigm of adaptation policy in glaciated regions. I draw on interviews with Quechua women, participant observation on adaptation planning teams, and informal expert interviews to advance the futuremaking framework, which prioritizes the everyday and future desires of women and households over technical adaptations that view people as vulnerable. Futuremaking is a feminist, decolonial process of everyday adaptation in a disaster zone that relies on A) Prioritizing the everyday over the someday; B) Intergenerational welfare and community networks of care, and; C) Dynamic and embodied adaptations to uncertainty. I argue that futuremaking both challenges the efficacy of adaptation projects currently underway in the Andes and charts a path towards more transformative adaptation interventions by prioritizing feminist networks of care over managing damage and disaster.

In **Paper 2**, I analyze the 2019-2021 process of creating Peru's national adaptation plan in order to understand how gender and Indigeneity are mobilized by different actors in climate change adaptation planning, and the broader work that these framings do for institutions, governments, and Indigenous women. I argue that Indigenous women leaders in Peru are drawing on their long history of territorial claims and landed expertise to re-make adaptation planning into a space that transforms the political aims of state-level adaptation policy by centering Indigenous sovereignty. In so doing, I make two contributions to the literature on transformative climate change adaptation: 1) I show that adaptation plans that foreground gender and minoritized

populations cannot be considered transformative or equitable if they do not address land and sovereignty, and 2) I demonstrate that plans that rely solely on gender and multicultural mainstreaming are liable to produce maladaptive outcomes, since they continue to protect economic activities like mining that disproportionately affect Indigenous women's health and adaptive capacity. This research is key for a policy and planning audience that is aware of the gendered and racialized politics of climate adaptation, but may overlook questions of territorial sovereignty and Indigenous women's embodied connections to land.

Finally, **Paper 3** draws on in-depth interviews conducted with Quechua women in four sites in the Cordillera Blanca. It weaves together in-depth interviews with Quechua women across three regions of the Santa River Valley in the Cordillera Blanca— along with participant observation, archival research, and document analysis— in order to understand Quechua women's everyday experiences of adaptation, and how these experiences intersect with political-economic struggles around gender, land, water, and agriculture in a region experiencing climate-related glacier melt, flooding, and water scarcity. We argue that Quechua women's *huertas* are political spaces that are often overlooked but crucial for community livelihoods during moments of climate, political, or economic crises, and that this has been continuous throughout time. They are also important for women's agency and well-being. However, these small-scale adaptation options are not often funded or supported sustainably at the scale of larger adaptations like flood prevention measures, both because women's voices are ignored, but also because of the highly political and gendered issues of land use and water rights that

huertas shine a spotlight on, as well as the assumption that near-household labor in service of adaptation should be done voluntarily and automatically without external support. This means that women's labor in supporting families and communities with local adaptations remains in the shadows, while at the same time this increasingly gendered aspect of this adaptation-related work represents an opportunity to address and enact transformative changes to the politics of gender, water, land, and adaptation in the Andes and beyond.

II. FUTUREMAKING IN A DISASTER ZONE: EVERYDAY CLIMATE CHANGE ADAPTATION AMONGST QUECHUA WOMEN IN THE PERUVIAN CORDILLERA BLANCA

Holly Moulton, Mark Carey

1. Introduction

In the Peruvian Cordillera Blanca, Quechua women adapt to social and environmental change through daily actions like tending home gardens, cultivating community support networks, and starting small businesses. The region is known for glacial lake outburst floods (GLOFs), which occur when glacier meltwater fills up glacier lakes, causing lake water to spill over dams or natural moraines and destroy towns in the valley below (Carey, 2010; Emmer et al., 2020). As a result of these highly visible and even iconic glacier disasters, the everyday adaptations of residents can be overlooked, ignored, or even suppressed when they do not foreground the celebrity-like ice loss issues. Essentially, the most marginalized residents and their everyday adaptations are often obscured by more high-profile disaster research and management strategies, such as producing flood maps, building dams, creating hydrological models of water scarcity, and installing GLOF early warning systems. Although these strategies are lifesaving, the singular preoccupation with disaster risk reduction means that limited time and attention are paid to the everyday adaptations of historically marginalized populations, like Quechua women in highland Andean communities.

This research engages with Quechua women's everyday experiences to interrogate narratives of vulnerability that have been ascribed to them by the Peruvian

national government, international aid organizations, and researchers (Zambrano & Beltran, 2012) and to provide an alternative to the preoccupation with future destroying floods. Indeed, climate adaptation scholars show that technical climate change adaptation interventions often undervalue the role of identity factors like race and gender in shaping the *context* of vulnerability (Eriksen et al., 2021; Kaijser & Kronsell, 2014) and Indigenous women in particular are often seen as homogeneously vulnerable to climate change rather than having diverse adaptation experiences (Heikkinen, 2017). Too much existing research in the Andes and beyond centers vulnerability, damage, and risk without addressing what the labels mean for residents rather than researchers, or asking whether they are even the appropriate concepts and labels in the first place. Most adaptation studies and policies in glaciated regions focus *first* on climate change and *second* on daily life, and only rarely on the intersections of race, class, and gender that shape the capabilities which support thriving over survival (exceptions include, for example: Bode, 1989; Carey, 2010; Cruikshank, 2014; Fox Gearhard et al., 2013; Gagné, 2019; Lynch, 1991). When researchers do expose these societal dimensions of ice loss and climate adaptation, they reveal a different set of risks that people face compared to the glacier-centric doomsday scholarship, in addition to showing that people can flourish and not just be vulnerable victims (Huntington et al., 2019).

This study takes women's daily lives as the starting point and shows that women are building flourishing home gardens in the middle of flood paths, cultivating community care networks, and managing social and environmental uncertainty. The results of this research demonstrates a new framework called *futuremaking* through

which to view daily life in disaster zones. Futuremaking is a process that takes Indigenous women's intersectional experiences of environmental and social change seriously and centers their situated environmental knowledge and capabilities. This framework centers a slower and more informed understanding of the everyday needs and desires of women and the communities they support, as opposed to the singular focus on GLOFs and large-scale interventions to reduce flood risk. This shift to deliberately center the everyday lives and desires of Quechua women also reflects the daily reality of households and communities in an area that is portrayed as a climate disaster zone.

This article draws from a case study in the Cordillera Blanca mountain range in the Central Peruvian Andes to advance a feminist framework of everyday adaptation that challenges the ice-and-water-focused disaster management paradigm in glaciated regions. The pillars that support futuremaking include: (1) focusing on the everyday rather than the someday, (2) fostering intergenerational welfare, and (3) cultivating a dynamic relationship with social and environmental uncertainty. This article advances scholarship in feminist environmental studies that seeks to re-orient damage centered climate change research (Huntington et al., 2019; Tuck, 2009) towards a focus on capabilities, women's everyday lives in specific contexts, and climate justice (Amorim-Maia et al., 2022; García & Olarte-Olarte, 2023; Nightingale et al., 2020; Schlosberg & Carruthers, 2010). This is especially important in the Global South, where adaptation interventions often mirror top-down development initiatives and do not focus on the everyday adaptations of the most marginalized, which advance community capabilities and desires under conditions of climate change. This work examines glacier disaster zones but alo shows

how women's futuremaking practices identify different risks compared to most glacier-focused researchers and policymakers, as well as how these women adapt, thrive, build communities and relationships, and make daily decisions in hazard zones and climate hotspots.

2. Feminist climate change adaptation planning

Feminist interpretations of climate change adaptation elevate ways of seeing the future, the community, the household, and environmental change through the situated knowledge of marginalized populations, such as Quechua women in highland communities in Peru (Haraway, 1988; Nightingale, 2016). A feminist lens on adaptation planning is necessary for three reasons: it questions North-South development and power dynamics that are also present in climate adaptation (Esquivel, 2016); it encourages intersectional analyses of household dynamics in order to interrogate broad narratives of vulnerability (Eriksen et al., 2021; Mikulewicz, 2018); and its allows for a situated analysis of Indigenous women's everyday lives, rather than a top-down and abstract view of women's vulnerability (Arora-Jonsson, 2011b). Importantly, Indigenous feminisms clarify that decolonization and Indigenous sovereignty are inseparable from issues of gender and power (Cochrane, 2014; Moreton-Robinson, 2013) and uncritical hazard planning tends to perpetuate harm caused by both colonialism and gender discrimination (D. E. Johnson et al., 2021).

Critical and feminist adaptation research critiques the development-based framing that addresses disaster management— such as through dam building— separately from

everyday life. These everyday adaptations are visceral, material, and embodied rather than abstract. Integrated watershed management strategies of rich nations and multilaterals have been shown to supersede the desires of development aid recipients and perpetuate North-South power dynamics (Escobar, 2011; Goh, 2019; Henrique & Tschakert, 2019; Sultana, 2019). When adaptation is tethered to development, only certain policy options are available, and they often follow patterns driven by Western ideas of adaptation outcomes rather than the lived experiences of those adapting (Funder et al., 2018; Mills-Novoa et al., 2020). Additionally, adaptation planning that is dependent on development pathways often constrains adaptation options and entrenches current inequities (Gajjar et al., 2019), especially amongst historically marginalized populations like Quechua women in highland communities.

Feminist adaptations rectify this by taking a situated view of lived experiences and how Quechua women navigate uneven power relations (Iniesta-Arandia et al., 2016; Ravera et al., 2016). It is critical to pay close attention to the lives of Quechua women, whose lives do not register within the dominant framework of understanding environmental change in the region—that of emergency, ice loss, and disaster. By centering often-ignored issues like emotions, subjectivities, knowledges, and politics, adaptation planners can better address uneven power relations that show up in adaptation planning (Gonda, 2019). Through the practice of uncovering and repairing uneven power relations through more just adaptations, a feminist ethic of care becomes central, thereby making the process of adapting more relational and less distanced from grounded contexts and lives (Bee et al., 2015; Haverkamp, 2021).

In addition, research on the embodied lived experiences of the most marginalized allows for a more realistic understanding of how environmental and uncertainty affect people's health, well-being, and adaptation options (Bee et al., 2015; Scoones & Stirling, 2020). Importantly, women center their bodies in futuremaking through conversations about reproductive issues, death, illness, symptoms, food, medicine, and emotions, which participants frequently connect to environmental issues. Therefore, embodied futuremaking is felt, directly experienced, and subjective, such as increasing heat and cold affecting women's joints as they work outdoors. Futuremaking makes embodiment legible, and the approach of embodied uncertainty adds an alternative to the analytic approach commonly used by aid organizations and academic researchers.

Importantly, feminist approaches to climate change also center the household as a site of everyday political and environmental struggle for Indigenous women (Bee et al., 2015). This challenges the stereotype of Indigenous women as simply homemakers and water bearers, which essentializes women, the environment, and households alike. Such stereotypes reduce women's agency and provincialize the home, relegating household concerns either to the mundane and unimportant, or to the waste bin as assumed products of patriarchy. This study starts from the feminist position that the household is actually a microcosm for understanding power relations reflected in wider communities and networks of care, even up to the international level (Buechler, 2016; Dyck, 2005; Nagoda & Eriksen, 2014).

3. Futuremaking and the everyday

This article uses the term ‘futuremaking’ to describe the incremental, everyday practices that Quechua women in the region use to adapt to social and environmental change. This daily process of making the future stands in contrast with modeling floods and water scarcity. Futuremaking also moves away from the tendency to label certain populations—such as Indigenous women— as homogeneously vulnerable and in need of intervention. Such sweeping classifications fail to understand that women in fact make their own futures through everyday life.

Futuremaking questions the inevitability of disaster-laden climate futures by using a different temporality than adaptation planning, which is often focused on modelling, risk assessment, and infrastructure on projected decadal scales. This study contributes to scholarship that shows the limits of the Western preoccupation with future emergency and crisis (Arnall & Kothari, 2015a; Bowden et al., 2019; McMichael et al., 2021). Temporality is an especially important aspect of local adaptation to changing ice and water landscapes, since women’s lived experiences are often invisible in the temporality of an acute yet potentially far off emergency (Lord et al., 2020). Narratives of urgency embedded glacial lake outburst floods mitigation, for example, tend to omit everyday adaptations and concerns that people negotiate to make the future in an *incremental* fashion, leading to temporal misalignment between local people and adaptation professionals. Shifting the ‘priority temporality,’ from acute emergencies and future catastrophic events to everyday *processes* of adaptation and futuremaking (e.g., by

tending herb gardens) creates a focus on lived experiences rather than the singular preoccupation with emergency.

These emergency-based responses often include narratives of progress and the Western goal of linear reductions in uncertainty through interventions like modeling and infrastructure, which typically overshadow the desires and everyday struggles of the most marginalized (Henrique & Tschakert, 2019; Hulme, 2011). They do not tend to take into account rhythmic responses to everyday life (Edensor et al., 2019) a way of viewing time that is important for many Quechua women in the region. Importantly, adaptations measures on Indigenous lands and that involve Indigenous people often fail to address local priorities like territorial and food sovereignty (Hill et al., 2020). This means that there are ultimately decolonial implications to taking seriously Indigenous women's futuremaking practices as an alternative to Western visions of emergency management.

The process of futuremaking highlights struggles over whose vision of the future shapes governance of the present (Elliott, 2021; Goh, 2019; Paprocki, 2018), and how different sets of knowledges —such as knowledge of flooding and ice loss versus knowledge of agricultural adaptations and community networks—are deployed to shape the future. In the Cordillera Blanca, projections of all but the highest glaciers disappearing past 2100, causing hazards from both new and longstanding lakes (Emmer et al., 2016; Taylor et al., 2023), mean that engineers and adaptation planners address uncertainty through their own practice of making the future. This practice is often more outcome based (flood emergency prevention and awareness, assessment of water availability) rather than process-based and focused on *bettering* conditions for present

and future generations (Nightingale et al., 2022). Futuremaking reframes uncertainty, since interviews show that uncertainty is a persistent component of everyday life to be addressed flexibly, rather than something to tame (Scoones & Stirling, 2020; Sword-Daniels et al., 2018). When uncertainty is addressed daily, controlling and calculating far-off emergencies is not a useful practice for making adaptation decisions.

4. Study Site

The study participants are Quechua or Quechua-Spanish speaking women who live in Peru's Cordillera Blanca mountain range in the Ancash Region. All participants primarily reside in the towns of Unchus and Llupa, population centers of 460 and 579 people which are located 30 minutes from the regional capital city of Huaraz, which has a population of 170,000 (INEI, 2017a). These towns were selected because they are located on the banks of the Quillcay River, which originates at Lake Palcacocha (see Figure 6). They thus live in rural spaces close to the Ancash capital, which has also been classified as "highly vulnerable" to emergencies like GLOFs (Frey et al., 2018).

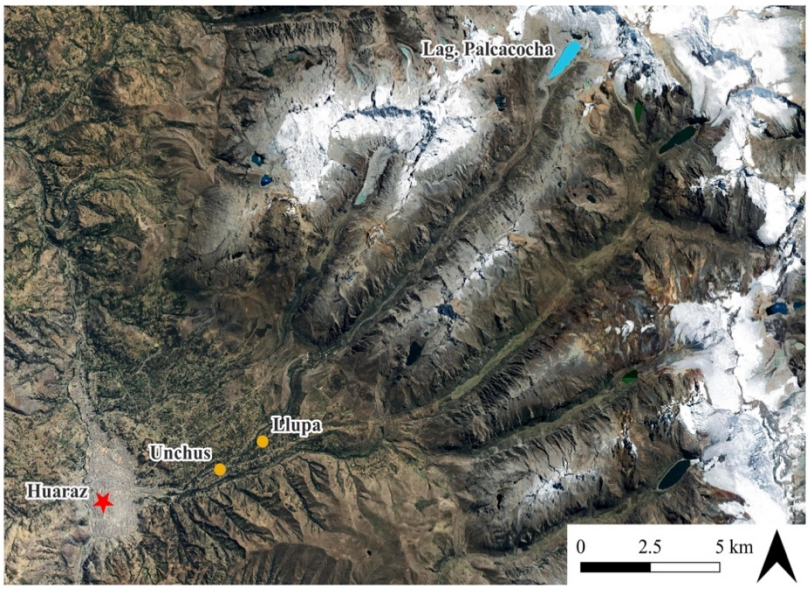

Figure 6: Location of study sites relative to the city of Huaraz and Lake Palcacocha. Image source: Google Earth

Many women identify primarily as *campesinas*, people who work the land in the countryside, in addition to or occasionally instead of identifying as Quechua. This reflects the history of gender, Indigeneity, and nationmaking in Peru, a country that both sees women as more Indigenous and closer to the earth but also sought to erase indigeneity in the project of nationmaking (de la Cadena, 1995). This study uses Quechua to denote the primary language and identity of all participants while also recognizing the plurality of experiences of Indigeneity and its complex history in Peru.

In Ancash, 84% of women worked in the informal sector in 2017 (INEI, 2017a), meaning that their work is precarious, subject to change based on social, environmental, and market forces, and not tied into social safety nets. Many women live in homes without running water and some lack electricity, but infrastructural access varies based on location and socioeconomic status. Importantly, residents travel between rural and urban spaces, navigating different risks and opportunities in each area.

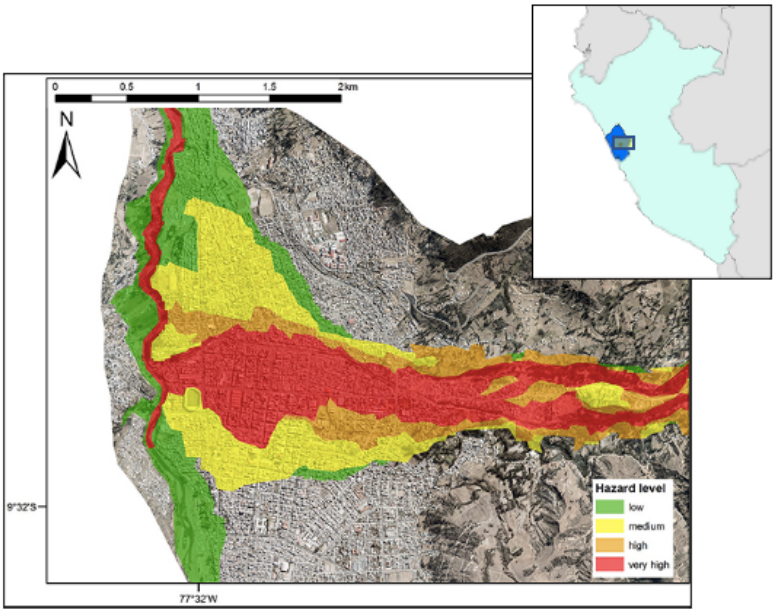

Figure 7: Inset map of hazard levels from GLOFs in Huaraz and surrounding towns (hazard map from Frey et al, 2018). Inset shows location in Peru and the Ancash Region.

Domestic and international media sources often portray the Cordillera Blanca as the site of a future-destroying GLOF from Lake Palcacocha. The *New York Times* has doomed these glaciers and the lives they support as climate change casualties, and the *Washington Post* announced that the Cordillera Blanca is a climate change adaptation experiment gone awry, focused almost entirely on the failure of Peruvian officials to install a permanent safety dam and early warning system at Palcacocha (Miroff, 2017), despite decades of successful glacial lake management and monitoring (Carey, 2010). Indeed, a 1941 glacial lake outburst flood from Palcacocha killed 1,800 people in Huaraz (Wegner, 2014), while

many other GLOFs have occurred since then such as in 2003 from Lake Palcacocha and 2010 from nearby Lake 513 (Carey et al., 2012; Moulton et al., 2021). Flood maps alert local people to GLOF hazard zones based on proximity to the Quillcay River (see Figure 7), and an early warning system has been designed but is yet to be installed (Casey, 2018; Frey et al., 2018).

5. Methods

This article draws on interviews and participant observation conducted between 2017 and 2019, with follow-up interviews conducted by Whats App with available participants in 2020 (see Appendix A for interview dates and locations). Six semi-structured life history interviews (DeLyser et al., 2009) and one interview with two participants simultaneously were conducted with women in the towns of Unchus and Llupa. Life history interviews asked about broad life experiences that connect place, environment, and biographical events for women in the Cordillera Blanca, while follow-up interviews conducted with three participants asked additional questions about themes that arose during initial interviews (see Appendix B for interview questions). The authors of this article are both white North American scholars who have worked collaboratively with local people in the Cordillera Blanca for a number of years (six years and 23 years respectively). As such, we acknowledge the process of translation and interpretation that occurs in the research and writing process (Nightingale, 2016; Smith, 2013; Sultana, 2019) and the need for reflexivity on the part of the authors regarding how knowledge is situated and shared (Iniesta-Arandia et al., 2016).

A local Quechua-speaking woman collaborated with the first author to recruit participants, coordinate travel, translate Quechua into Spanish, and refine interview questions. Participants for this study were recruited through the collaborator's close relationships with local residents. 'Walking with' interviews (Jones et al., 2008) were used by the lead author and collaborator in cases where women could not pause their daily activities to talk. These interviews occurred in the participant's setting of choice, sometimes spanning 10 kilometers and 2,000 feet of altitude, and sometimes occurring right outside the home.

Participant interviews asked about daily experiences, including access to environmental and economic resources, early childhood memories, employment, mobility, family structure, and familiarity with adaptation words like vulnerability and resilience. Damage-oriented questions about climate impacts were avoided, since they often presume vulnerability and miss social context (Ensor et al., 2019). To understand both these larger processes and the conditions that support women's desired lives, capabilities-oriented questions (Schlosberg & Carruthers, 2010) were used, such as "what are the social and material resources that you use to support yourself and your family?"

The framework of futuremaking emerged after performing three rounds of thematic coding on interview data and participant observation notes. Grounded coding revealed key differences between how women discuss their lives and how multilaterals, government officials, and researchers understand women's experiences. Women's language aligned with the concept of futuremaking, which scholars have described as a process of imagining and testing everyday actions through which people create their

visions of the future (Comi & Whyte, 2018) or engaging in present activities to create the future under uncertain conditions (Kleist & Jansen, 2016). In the first round of grounded coding, the exact words and phrases that women use to describe their everyday experiences were analyzed, along with references to environmental and social issues. For the second round of coding, the 55 themes that resulted from round one were sorted into three broad categories: everyday concerns and activities, intergenerational issues, and relationships with social and environmental uncertainty. The final round of coding refined and verified these three categories by re-reading each interview to specify the language of each pillar of futuremaking. Lastly, these categories were verified across interviews, and discussions that were unique to individual interviews were noted in memos.

6. Pillars of futuremaking

Futuremaking practices among participants revealed three principal pillars: A) Prioritizing the everyday over the someday; B) Intergenerational welfare and community networks of care, and; C) Dynamic and embodied adaptations to uncertainty. In the sections below, we illustrate how women experience and explain these three pillars in their daily lives, thereby exposing larger processes of futuremaking. All participant names have been changed for confidentiality.

6.1 Prioritizing the everyday over the someday

Women described a range of everyday activities that give texture to their lives in an area that is portrayed as a disaster zone. They describe cooking, taking care of children, watering crops, attending water council meetings, watching television, purchasing animal feed, and traveling to the market, among other activities. One participant named Yobana said "These things are life in the country, on the farm." Others noted that working is necessary, day in and day out, and that women are primarily responsible for this household and familial upkeep. Most of the women live in multi-generational households, so everyday life also includes caretaking, although the level and type of caretaking varied based on family and community commitments.

In discussing everyday life, women frequently mentioned climatic and weather changes, including heat waves that damage crops and encourage pest infestations, increasingly frequent shortages of irrigation water during the summer dry season, and the relief of the '*más tranquilo'* (slower) pace if life water is abundant. Participants stated that local authorities ignore these environmental changes and their effect on everyday activities, suggesting instead that policymakers were more interested in either their own gains or glaciers. Women say that they would like local governments to focus on things like water and fertilizer, or their daily lives, rather than more typical workshops on flooding and climate change awareness.

Women address their goals with limited social support and under uncertain environmental conditions by advancing the concept repeated often of *poco a poco*—which translates to "little by little." *Poco a poco* is a way of making the future by using small, daily actions and observations to engage with visions of the future and challenges

that arise. Several women used *poco a poco* to describe melting glaciers, noting "little by little they are melting." For example, Giovanna noted that "Before, when I was younger, there were lots of springs, more water. But little by little, I see that there is not water in the springs, they're drying, they are dry. There isn't even any for the animals. Or for humans to consume." Importantly, women also used *poco a poco* to explain incremental life changes over long periods of time, sometimes multiple generations, instead of quick pivots. One woman named Julia said, "I had no choice, little by little I learned to cry less and to be stronger for my children" after their father was killed in an accident. Another woman said she was advised to "build her tourist hotel a floor at a time" once she could afford construction so that she would be "motivated and incentivized by little-by-little progress."

The most consistent element of everyday life that women discussed was the *poco a poco* cultivation and maintenance of *huertas caseras,* or home gardens. *Huertas* are year-round vegetable and herb gardens that increasingly offer a climate- and weather-resilient source of crops to sell in the local market, as well as a supplement to household food supplies. *Huertas* are small and require less water than a larger potato farm, which is the main form of household agriculture in the region. Moreover, their fast-growing crops can be frequently swapped based on market prices, water availability, pest infestations, or following damage from heat or hail. Women primarily tend *huertas*, although men occasionally assist depending on the season and available work.

Huertas require everyday engagement in the form of weeding, watering, applying fertilizer, harvesting, and switching out crops. However, the level of attention required

varies based on the season, rainfall, and the amount of available water in rivers and canals –water that comes from glaciers in the dry season. For example, Julia explained that she waters all day in the dry season when water is scarce. She said her free time was limited because, “When I am not working, I’m in my herb garden. I’m gathering, sowing, irrigating, almost all day” In the wet season, water is abundant, and it is easier to have a *huerta*. Julia said*, “*Many people plant herbs in the rainy season, the whole village, so it’s very cheap to sell them. In contrast, in the dry season, for example beginning in June, July, August, September, and into October, there are not herbs because there is no water so, they don’t plant a lot." By watering all day during the dry season, Julia is able to make more money with less market competition, which is important for her as a single mother.

Households and the *huertas* alongside them provide a landscape for futuremaking. They are spaces where women operate in a slower sense of time, making incremental changes to herb crops and income strategies, cultivating family relationships, and making adjustments to everyday life. However, women’s daily lives differ based on material constraints, social forces, markets, and value judgements. This includes access to resources, free time, expectations of community support, values, culture, professions, and family commitments. Some women felt restricted, since they were unable to explore opportunities outside of the home due to limited education, constant irrigation management, gendered expectations of motherhood, and family duties. One woman, Giovanna, expressed, “One gets sick of spending every day in the same place.” A participant named Martina mentioned that she would like to sell vegetables from her *huerta*, but she has to stay home and watch her children because “my kids are young,

they need attention, and my husband doesn't want to do it." Julia's sister Violeta told me that she considered becoming a mountain guide, but she did not know any women doing this and did not know where to start. Futuremaking is thus predicated on the capabilities necessary to take daily actions of one's choosing, which requires access to resources that facilitate this process, such as materials and money, or free time, family support, and community conditions (Holland, 2017; Schlosberg, 2012).

Despite their limited focus on emergencies, many women in the Quillcay watershed are aware of GLOF risks. For instance, Julia said "they say the lake could fall, but I don't think it will. The glacier is too far up now" and her daughter learned about GLOFs from Palcacocha in school but is not worried. When asked about their biggest environmental concerns, participants mentioned heat, hail, water availability, and pests, but never GLOFs. This tracks with work done by human geographers in the region (Carey et al., 2014; Motschmann et al., 2020; Walker-Crawford, 2019), which shows that flooding is not a primary concern. In fact, flooding is a someday event that women acknowledge as a possibility, but is less worrisome than changing rainfall, pests, access to jobs and income, and schooling for children.

Specific everyday concerns—both material and value-based— outweigh the risk of a sudden flood for women, a flood that could be thought of as the 'someday' rather than the 'everyday.' These everyday concerns include household maintenance, money, *huertas*, business goals, access to credit, family values, cultural expectations, community norms, and the need to be physically present for the family while men travel for work in tourism. These concerns shine a light on capabilities that allow everyday life to function in service

of a desired future. All participants envisioned a future that is comprised of aggregate daily moments that increase both present and future standards of living. For example, through planting gardens that provide both daily access to food and a future source of income for personal goals. Futuremaking offers a framework to fully engage with everyday social and environmental conditions in the region, and therefore to lay the groundwork for a future that women desire.

6.2 Intergenerational welfare and community networks of care

A self-stated role of women in the Cordillera Blanca is to foster community networks of care and intergenerational welfare, whether that be in large intergenerational houses, or in community-based arrangements. When she was 15, Maria dropped out of school and took a housekeeping job in Huaraz to support her family. At age 25, she now stays home to care for her 18-month-old daughter and prepares food for her husband, who has struggled to find consistent work. The household gardens also provide an avenue for building intergenerational networks of care. A young woman named Yobana, for example, emphasized that *huertas* are always a multigenerational project, stating that "For the most part, me and my mom are the ones who dedicate ourselves most to the *huerta*" and Julia underscored this with stories of her and her deceased daughter, who used to spend hours watering and weeding the *huerta* alongside her.

Futuremaking in the region relies on enduring relationships among multiple generations of women. Violeta and Julia, who are sisters, work to support their larger extended family. Violeta does not have children and explained that her parents are elderly

and frequently ill, so they need monetary support. Their parents own the land the family lives on, but Julia and Violeta manage the *huerta* and household. Additionally, Violeta learned housekeeping, accounting, and administration at a local tourist hotel, and ultimately decided to build her own hotel on her family's land. Violeta left school at age 12 to support her family but taught herself business skills, including basic English and how to get loans for construction supplies. She said she had been asked to repeat a year of school in sixth grade, but "when we have to repeat a year, they [our parents] don't want us to return, our parents don't want us to return to school" so she had to teach herself. But she emphasized that now, most parents want their children to study because "we want to make sure that our child is not like us." Both Juana and Lidia corroborated what Violeta expressed, that women take care of animals, pigs, guinea pigs, chickens, cows, herbs, and farm crops to make a living so they can support their children's educational and professional goals.

In addition to managing and maintaining household-level activities for multiple generations, often take on both traditionally masculine and traditionally feminine roles when a spouse passes away, travels for work, or is estranged from the family. This blurs the boundaries of historically gendered activities in the Andes. For example, Violeta says that single mothers have tremendous courage because they work constantly and have to be "strong to be both father and mother for their kids." Maria echoed this language, discussing her desire to leave her husband in Huaraz and move back to her hometown. Her husband makes limited money, and her daughter would benefit from growing up in a mutual care setting, Maria explained.

Some women were hesitant about the idea of futuremaking through motherhood. Violeta was nervous about romantic relationships because motherhood could disrupt her fledgling business. Martina was also hesitant to have another child since her house was too small, and they lacked the resources to add more space. She would also be the sole caretaker and would instead prefer to start her herb business with Julia. These experiences highlight women's daily political choices to resist gendered expectations in a region where domestic violence is high, women's healthcare is poorly funded, and teen pregnancy is common, but education for young women is increasingly more accessible (*INEI*, 2017b). Futuremaking is therefore tied to parenting, and motherhood and fatherhood are roles that many women identified with in distinct ways, either claiming or reworking gendered parenting roles depending on one's unique family situation.

Futuremaking is also an expansive task that requires a network of community relationships, primarily amongst women who support each other in daily tasks and bolstering capabilities. Violeta and Julia described women at the tourist hotel who gave them advice about how to expand their *huerta* and hotel business. Their mentor had recently opened a successful hotel and shared valuable learning experiences with them, recommending the *poco a poco* approach and saying this would help Julia to "*salir adelante*," or move forward, to better support her kids. Julia also asked for advice from a friend about her *huerta*, because she did not learn from her mother. She said "I had a friend, she planted, she told me to plant herbs so you can sell them. She was the one who told me exactly 'you are going to do it like this.'" Moreover, Violeta often hauled sacks of potatoes or bundles of hay to women in her neighborhood. This material and labor

support allowed families who lacked access to extensive farmlands, or who could not reach their farms because of age or illness, to have a source of food security. Martina and Julia talked constantly about combining their herb businesses and selling directly to consumers to make more money. Martina's caretaking situation with her children made this difficult, and Julia's recent loss of her daughter put this on hold. But they remain friends and share the goal of combining their efforts in the future. In these ways, futuremaking provides generative space for enhancing community capabilities and feminist networks of care.

Women show that intergenerational welfare and community networks of care are integral ways of living in order to not just survive, but to learn of new opportunities and adapt to social and environmental changes (Radcliffe, 2015).This focus on community networks of support and intergenerational welfare shows how women make the future not just within the span of their own lifetimes, but also in thinking about their children, parents, and other community members. Although many adaptation projects now take a community-based focus and hold workshops with local people (for example, Crawford-Walker et al., 2018), the emphasis on community care and intergenerational welfare should be strengthened in order to create more equitable adaptations**.**

6.3 Dynamic and embodied adaptations to uncertainty

Women in the region rely on two key elements to address climate and social uncertainty—dynamism and embodied adaptation. Environmental uncertainty in the Cordillera Blanca includes issues of water access and quality, changing seasonal

precipitation, lack of household plumbing, flooding, and seasonal temperature extremes—all of which are experienced viscerally and require dynamic adaptations to navigate. These sources of uncertainty affect many residents of the region, but issues like geography, class, race, and gender affect adaptation options. This environmental uncertainty is therefore felt and perceived, or embodied, in different ways based on identity, and embodied uncertainty cannot be addressed with static adaptations that are disconnected from daily experiences.

One way that women adapt to uncertainty in a dynamic and embodied way is through movement. Violeta constantly moves throughout the watershed, going from the market to the tourist hotel where she works, to her family's house and farm, then up to glacial lakes with tourists and friends, then back again, sometimes covering 20 kilometers and thousands of feet of elevation change in in a single day. She experiences stress headaches from working in Huaraz, which is heavily polluted, and seeks out fresh mountain air and cranial massages from a local woman to alleviate these headaches. Violeta has a higher socioeconomic status than Maria, Juana, and Yobana, since she has been able to make money and invest in her business. Therefore, she can adjust more easily to these sources of environmental uncertainty. For example, she can leverage her mobility and work in hospitality in Huaraz when crop yields are uncertain due to seasonally heavy frosts. Likewise, she can purchase or sell cattle depending on market prices and interannual observations of water and pasture availability. If cattle husbandry requires long days walking to water sources because local springs have dried up, Violeta sells them and invests the money in her hotel. Dynamic mobility is therefore a key strategy for adapting

to uncertainty, but women have different types of mobility available to them—and mobility changes throughout life.

Women with *huertas* have a keen awareness of the uncertainty involved in selling goods in the market (Babb, 2018). All women with *huertas* watch buying prices and the relative value of herbs depending on competition. Few women have access to enough water to irrigate *huertas* during the dry season. This is because glacial meltwater is the primary source of streamflow in the summer, and reduced streamflow as glaciers disappear means that water supplies are seasonally limited by competing water users. Upstream homes may drain available water in the canal before it runs to properties below, or there simply may not be enough water available. Therefore, women spend longer periods of time fully irrigating their *huertas*. Several women said they would like to secure enough money to buy a water tank to avoid dependence on fluctuating water supplies in the canal.

Women, as the people primarily responsible for household and near-household water management in the region, must be flexible in the face of this environmental uncertainty. To adapt to changing water supplies, most research participants adjust their planting schedules, irrigation timetables, and selling strategies on a seasonal and annual basis. Juana stands in her *huerta* and waters all night in the dry season. Despite her exhaustion, if she does not water at night, she spends more money on lower quality store-bought food and fertilizer to hedge against poor soil conditions. Some of this uncertainty is related to environmental change, and some of it is seasonal and social in nature and requires

additional knowledge to navigate (Birkenholtz, 2013; Sultana, 2009), since technical sources of irrigation and drinking water management are lacking in many rural areas.

Quechua women living in rural areas like Juana and Lidia sometimes described the need to "submit" to environmental changes like decreased rainfall and melting glaciers, as well as social changes like nearby mines. They too stay up all night to water their crops when there are no other competing water users, putting their bodies and health on the line to adapt to uncertainty. They told me "cold, hot, where can we go but here?" They had limited access to education and feel they are not capable of changing their lives as a result. In contrast, Maria currently lives in Huaraz and is often in her house with her toddler. She has running water and easy access to grocery stores but is much more physically disconnected from social environmental changes. Were she to move back to Llupa where her parents live, which she expressed a desire to do, she would experience this environmental uncertainty differently because she would be directly involved in daily acts like watering crops, herding animals, and gardening.

Accepting or trusting uncertainty was also a common theme in interviews. Martina described how her Evangelical religion helped her to process the life's challenges by giving her a larger sense of God's plan. She trusts in God, and often repeated the phrase "*si dios quiere*" (God willing). Indeed, scholars of environmental hazards have shown that religion can enhance social cohesion and coping capacity in glacier disaster zones (Sherry et al., 2018). Many participants expressed this trust through the lens of a Christian or Catholic god, who may justifiably punish or reward both individuals and entire societies. Women express this acceptance or trust in distinct ways, such as singing

at church, dreaming of building a new house, worrying about end of times flooding, or investing heavily in the goals of younger generations. Julia noted that trust and action make her capable of providing for her family, saying that, "I continue this way, and if God wants, I can have a lot of things." This acceptance is not fatalistic, even when the outcome is uncertain or potentially bleak. Rather, it is a trusting expression of faith.

Importantly, this trust and acceptance of uncertainty should not be conflated with passivity. Julia for example both trusts in God and also engages in a variety of actions to steer her future. She stopped raising cattle, which require long periods of time to mature and are dependent on healthy rainfall and wetland systems for pasture. A consistently reliable seasonal rainfall has become less certain over time with climate change. Instead, Julia chose activities that she calls "more productive" and more enjoyable, such as selling herbs and vegetables from her *huerta* and raising guinea pigs. She manages uncertainty through a keen eye on market prices for different kinds of goods and pays attention to the larger social and environmental conditions that would either support or detract from her capacity to earn money, such as rainfall, competition, national politics, access to water in canals, and community cooperation. She does all of this while both choosing activities that are enjoyable and accepting that there is a larger plan for her life that guides these everyday activities. Maria echoed this, noting that "we have to accept and see things better. What can we do in life, while we still have it?" Here, Maria and Julia are accessing flexible, everyday capabilities that allow them to cope with uncertainty.

Participants never spoke about their fear of sudden, deadly events like floods. They did, however, discuss the full-body grief that comes with losing a loved one. When

you live in a flood zone where a GLOF may or may not happen in your lifetime, these embodied losses take precedence and are the types of events that affect people's ability to adapt and continue making the future. For example, Julia explained that the death of her daughter had changed the trajectory of her garden, her business, and her life. She said, "When Shayuri died I didn't attend to them very well, and all of the herbs died. *Muña*, chamomile…they died. They were doing well and were ready to be picked, I was getting ready for this and then…I didn't have the wherewithal to do anything so I didn't pay attention and everything died." But she emphasized that she was not discouraged. She pivoted to planting quick-growing crops in her *huerta*, telling me, "I have turned the soil and after I planted radishes and turnips as well. Now I have to go harvest them to bring them to Huaraz tomorrow." This dynamic relationship with grief is a capability and her garden allows her to pursue multiple adaptation futures based on her life circumstances.

Currently, disaster risk reduction and adaptation planning are written and conceived of as separate from plans for local development and social services. This means governments and adaptation planners often manage different types of uncertainty than the types that women conveyed in interviews. Such a disjuncture means adaptation planning works to control water-and ice-based uncertainty, rather than supporting women's capabilities and desires to manage uncertainty in dynamic ways that protect the bodily health of themselves, their families, and their communities.

7. Discussion: Futuremaking and capabilities in climate change adaptation planning

Through regular acts of futuremaking, such as tending vegetables for elderly parents or supporting new business owners, Quechua women create the conditions for entire communities to adapt to social and environmental change. Daily, dynamic adaptations to uncertainty are essential to futuremaking because they encourage a process-oriented view of adaptation rather than an outcome-based view. This process is material and embodied and cannot be easily represented in a model or flood map, or addressed with glacial lake dams, which most women living in highland valleys rarely think about or come into contact with. For example, the health effects of shifting access to staple foods and the embodied effects of provider stress are outside the temporal and physical scale of infrastructure and mapping projects. Therefore, the three pillars of futuremaking mediate the effects of climate change in ways that disaster-focused adaptation support cannot.

Futuremaking shows that climate change adaptation planning, including flood mitigation efforts, must be able to see and address these everyday experiences to provide equitable adaptation support. Experiences of futuremaking are better addressed through the framework of capabilities than through the dominant lens of vulnerability, given the potential for capabilities frameworks to transform existing power inequities. The capabilities approach to just adaptation tends to foreground the conditions necessary for people to live full lives, which includes resources, knowledge, and ability to choose one's desired conditions and supporting resources rather than having climate adaptation imposed on them (Nussbaum, 2001; Schlosberg & Carruthers, 2010; Sen, 2000) or rather than prioritizing adaptations that do not support the conditions necessary for transformative adaptation (Holland, 2017).

A feminist framework for adaptation planning and disaster zones has the potential to center capabilities for transformative adaptation by ensuring not just minimum access to resources like water and food, but by supporting the capabilities that allow Quechua women to thrive despite the threat of disaster and historical social marginalization. This could come in the form of intergenerational knowledge of *huertas*, dynamic ways of relating with uncertainty, and everyday adaptations, the pillars of futuremaking. These are all capabilities, not just material resources or infrastructure. Not only that, but this research on Quechua women's lived experiences shows that homogenous labels of vulnerability to flooding, often based on location and marginalized social identities, do not accurately portray differences in lived experiences between different groups and individuals. These labels of vulnerability also reinscribe gendered stereotypes of helplessness (Arora-Jonsson, 2011b) that could lead to more damage-centered research.

This study helps to flesh out the specific reasons why women are not thinking about GLOFs—despite the real hazards they present—but are instead thinking about the environmental and social conditions that *support* a home and family on a daily basis, rather than *destroy* the home. Futuremaking makes space for both worry and dreaming in a region that is mired in apocalyptic images of ice loss, flooding, and water scarcity – issues that are not caused by climate change alone, but rather are deeply intertwined with resource extraction, capitalism, and power. The findings from this study align with scholarship on the adaptation imperative and depoliticization, where addressing climate change adaptation without addressing the political lives of the most marginalized people will only further obscure their voices in adaptation policy (Marino, 2015; Ribot, 2011).

This is especially true in adaptation planning in glaciated regions, where urgent disasters appear to always be just over the horizon, which appears to justify highly technical planning that reduces uncertainty.

This research shows that temporality is a critical and understudied element of adaptation planning in this region. Hazard zones on flood maps speed up time, only showing fast moving floods and quickly melting glaciers that could change the lives of the region's residents in minutes. In contrast, women interviewed for this study emphasized changes that happen slowly, through daily actions and an investment in well-being across generations. The visual practice of speeding up time through maps and models, looking deep into a future that seems to have already been written, distracts government and international adaptation experts from also studying and supporting intergenerational practices of Quechua women. Adaptation planning in the region is not usually designed or funded in a way that expands this relational awareness or longitudinal view of incremental practices. Ultimately, this is perpetuated by well-intended people and organizations, whose management practices come from Western practices of categorizing, managing, and intervening to reduce risks. Since women note that change often happens little by little and on a sometimes-intergenerational timescale, adaptation programs that expect immediate results may run the risk of looking at local people as foolhardy if project managers expect change to happen at the pace of a project's goals rather than daily life. If women's capabilities, as demonstrated through futuremaking, were also supported, it would better the lives and adaptation options of entire communities and address the temporality that Quechua women prioritize.

8. Conclusion

This work elevates ethnographic accounts of Quechua women's daily experiences of living in a glacier hazard zone that appears to be under the constant threat of disaster with limited hope for a flourishing existence. The study finds that Quechua women use the process of futuremaking to navigate intersectional experiences of environmental and social change. Futuremaking consists of three pillars—prioritizing the everyday over the someday, fostering intergenerational welfare and networks of community support, and a dynamic and embodied engagement with uncertainty. The article argues that by centering Indigenous women's experiences of futuremaking in everyday life, particularly by bringing a feminist lens to adaptation studies, decisionmakers can understand the politics of the everyday for the most marginalized and shift adaptation planning towards a capabilities-focused framework rather than centering damage.

The current framing of emergency and risk reduction in adaptation documents has a profound effect not just on how the world sees local adaptation efforts, but on how ideas of small-scale experimentation and failure become labeled as diversions from rational and structured adaptation interventions. Technical experts often view the desire to focus on the everyday rather than the someday as a 'shortsighted' feature of rural life (Ojha et al., 2016). However, when viewed from a feminist perspective, the focus on the everyday maintains life and holds the possibility of both flourishing and resisting narratives of decline in regions that experience glacier disasters. Feminist approaches to climate change adaptation can recenter the agency and capabilities of women and prioritize local communities and networks of care, which forges a path towards

transformative adaptation. Instead of focusing solely on disaster, adaptation planning professionals and researchers should start with Indigenous women's practices of futuremaking, moving from the questions of "how much damage will flooding and water scarcity cause?" to "how are people living with changing conditions?" while addressing the social structures that shape diverse futuremaking practices. Without considering these processes, climate change adaptation planning worldwide will not ultimately be responsive to the desires of those who have been most marginalized, especially Indigenous women.

III. '*LAS MUJERES SON LAS GUARDIANAS DE LA PACHAMAMA*": REFRAMING PERUVIAN CLIMATE CHANGE ADAPTATION PLANNING THROUGH INDIGENOUS WOMEN'S POLITICS OF TERRITORIAL SOVEREIGNTY

1. **Introduction**

Across the globe, countries are increasingly incorporating social differences like gender, race, and socioeconomic status into their climate change adaptation planning rather than simply focusing on natural hazards (S. Eriksen et al., 2021; Morgan et al., 2019). As a result, themes of vulnerability and marginalized communities are now more central to global discussions of adaptation planning (Atteridge & Remling, 2018; S. Eriksen et al., 2021; Morioka et al., 2020). This recognition of structural differences and injustices in adaptive capacity has led to Gender Action Plans in over two dozen countries (*IUCN*, 2020) and plans that recognize how power creates uneven adaptation outcomes both within and between nations based on income, race, class, geography, and other types of difference (*UNEP*, 2022; Juhola et al., 2016). Indigenous women are increasingly targeted for inclusion, with organizations like the United Nations stating that "Indigenous women continue to face the fatal health impacts of environmental degradation and extractive industries" (United Nations, n.d.) but also that "Indigenous women are vital to climate action" (*UNFCCC*, 2021).

Peru is one such example of a country who has attempted to address adaptation differences and injustices by increasing the representation of Indigenous communities and Indigenous women. Yet these national-level attempts to better represent gender and Indigeneity in adaptation planning, for example, often fail to address Indigenous

women's specific demands based on their self-stated experiences of what supports and hinders adaptation. For example, Indigenous women are clear that the continued presence of mining and other extractive activities undermines the adaptive capacity of Indigenous communities and women. Melania Canales, the leader of the Indigenous women's organization ONAMIAP, says that by resisting mining, Indigenous women are safeguarding not only the lives of those who are directly affected mining, but *all* lives. She says, "Indigenous women defend life, all life. Because if they [mining interests] destroy those lives, they will also destroy our lives" (Encuentro sembrando vida). Territorial sovereignty and juridical security are therefore the foremost demands of Indigenous women in order to continue to be the self-stated "guardians of Pachamama [Mother Earth]" within the context of both climate change and a long history of dispossession. However, the Peruvian state has been silent on the role of land use, sovereignty, and extractive activities and how they undermine the adaptation futures of Indigenous women. This failure to take Indigenous women's demands seriously undermines the transformative potential of national adaptation planning processes that purport to be inclusive. However, Indigenous women's organizations are actively resisting these efforts at erasure and continued violence in the context of climate change adaptation.

This research asks the question: How are gender and Indigeneity mobilized by different actors in climate change adaptation planning, and what is the broader work that these framings that they do for institutions, governments, and Indigenous women? By analyzing the 2019-2021 process of creating Peru's national adaptation plan, I argue that

Indigenous women leaders in Peru are drawing on their long history of territorial claims and resistance to extractive activities to re-make adaptation planning into a space that meaningfully considers Indigenous sovereignty. They do this by working to transform the political aims of state-level adaptation policy, which do not accurately reflect Indigenous women's intersectional framing of land rights and adaptation (Hill et al., 2020; D. E. Johnson et al., 2021; Watts & Peet, 1996). I draw on both a targeted and thematic analysis of the following types of documents: Peru's national adaptation plan, webinars held by the state in the process of creating the plan, webinars and meetings held by Indigenous women's organizations, institutional reports by NGOs and multilaterals, social media, and news media. In so doing, I examine Indigenous women's intertwining resistance to extractive activities like mining and the state's vision of "adaptation as usual." I find that the state's vision of adaptation fails to account for *ongoing* sources of violence against Indigenous women that undermine adaptive capacity—instead seeing climate change as a separate threat to Indigenous communities and women.

This study makes two contributions to the literature on transformative climate change adaptation: 1) I show that adaptation plans that foreground gender and minoritized populations cannot be considered transformative or equitable if they do not address ongoing threats to land and sovereignty, and 2) I demonstrate that plans that rely solely on gender and multicultural mainstreaming are liable to produce maladaptive outcomes, since they continue to protect economic activities like mining that disproportionately affect Indigenous women's health and adaptive capacity. This calls

into question the idea of producing adaptation plans at the scale of the sovereign nation, and whether these plans can ever equitably address diverse populations.

Indigenous women in Peru are demanding that sovereignty be included in the relatively new-to-Peru combination of gender mainstreaming and climate change adaptation planning that is being articulated by the state and multilateral organizations[1]. This is an opportunity to go beyond just gender mainstreaming and multiculturality to redress dispossession from territory, extraction, and any other interventions that have prevented Indigenous people from "developing as they see fit" (UNDRIP, 2006) in alignment with the principles of climate justice. The cost of not doing so is to forego the opportunity to develop national adaptation strategies that address and implement transformative change.

This research is key for a policy and planning audience that may be international or multinational and may therefore overlook questions of territorial sovereignty that typically fall under Peruvian jurisdiction in their quest to mainstream gender into adaptation planning. The consequence of overlooking the intersection of adaptation, gender, and sovereignty is to continue to perpetuate violence against Indigenous women in particular by turning a blind eye to the role of extraction and dispossession in undermining adaptive capacity. This means that efforts to mainstream gender and intercultural justice into adaptation planning will be unable to address the maladaptive

[1] For the purposes of this study, multilaterals are defined as entities or organizations with a transnational reach that have a vested interest in a particular vision about how race and gender intersect with climate change, and how they should be treated in adaptation planning. Multilateral organizations are funded by multiple governments, such as Canada, Germany, the United States, the United Kingdom, and Ireland in the case of the NAP Global Network.

outcomes that come from continuing business as usual around land and natural resource extraction.

Importantly, this study focuses on the demands of people who identify both as Indigenous and as women. Through its process of mainstreaming gender into adaptation planning, Peru identified Indigenous women as vulnerable populations whose human rights must be "monitored and evaluated" in the process of adapting to climate change (MINAM, 2021, p. 11). As a result of the Peruvian state's focus on closing the gender gap between men and women in adaptation (MINAM, 2021, p. 9), I focus on the demands and positions of different actors vis-à-vis gender and indigeneity from the perspective of Indigenous women.

2. Theoretical and historical context

2.1 Land and territorial sovereignty

Indigenous communities in Peru have a constitutional right to their land (Article 89). The state is also legally required to consult and receive consent from Indigenous communities regarding legislative or administrative procedures that affect their land in accordance with ILO 169 (*ILO*, n.d.). However, the process of legally registering this land as a sovereign territory is fraught (Thurner, 1997) and the law of free and informed prior consent or FPIC is rarely followed ("Defensoría del Pueblo," 2022). Formal titling processes, while not the same as recognizing sovereignty, are also difficult for communities to obtain due to a host of bureaucratic barriers (Glavin et al., 2013; Tubbeh & Zimmerer, 2019).

Rights to land and territorial sovereignty are distinctly different concepts in Peru. Indigenous communities across the country live on their ancestral territories, but the state often sees and frames these territories as land, a more inert term that connects to legalistic language of claims and property titling rather than historical connections to the earth as life itself (MINAM, 2021; Article 89, n.d.). Additionally, debates about who counts as Indigenous and therefore who can claim ancestral ties to the land rather than just property rights (Chirapaq, 2017a; de la Cadena, 1995; Gadea Linares, 2021) create a pronounced difference between property titling and demands for sovereignty. For example, the Autonomous Territorial Government of the Wampis Nation is the first Indigenous community in Peru to gain jurisdictional sovereignty over their land, meaning that they can protect their land from outside interests in natural resources (*IWIGIA*, 2018). In contrast, all other Indigenous communities, even if they have titles to their land, do not retain sub-soil rights. The state retains usufruct rights for mining and harvesting of other natural resources, like forests (Fraser, 2017; *LandLinks*, 2016). Moreover, there are increasingly deep divisions between the elite, whiter, capitalist, decision-making classes that are located in the capital city of Lima and the highland and Amazonian Indigenous and peasant communities that often bear the brunt of these political decisions with limited participation or input (Orlove, 1993)

For the purposes of this study, there are three key points to keep in mind about land rights in Peru: Indigenous communities in Peru are actively fighting dispossession from their ancestral territories, especially for mining claims; the process of registering an Indigenous community for either titling or territorial control is difficult legally,

practically, and politically, and; Indigenous women have historically been amongst the most land-insecure people in the nation, with a few national attempts to increase private land registration, but with limited overarching success and almost no attention to territorial claims rather than legally-framed land-ownership.

Recently, the IDB and Peruvian state have come together, with a $40 million budget to initiate the "Cadastre, Titling and Registration of Rural Lands-Third Stage" Project (PTRT3), which affects both the registration of peasant land titles and Indigenous and native communities. The PTRT3 Project is designed to provide titles to Indigenous communities, and women in particular. However, the large amounts of international financing put towards registering Indigenous and Indigenous women's territories are not designed to contribute to territorial sovereignty movements. They are projects that international donors and multilaterals invest in largely because of the connection between titling Indigenous communities and positive outcomes with forest conservation in the Amazon, for example (Blackman et al., 2017; Merino & Gustafsson, 2021), an issue that receives substantial international attention, often at the expense of support for other geographies in Peru (N. Mori, personal communication, June 21, 2022). Additionally, titling itself is insufficient according to many Indigenous leaders, because it does not protect against the deleterious effects of the state's usufruct rights for mining and natural resource extraction on Indigenous lands, which directly undermines adaptive capacity (ONAMIAP, 2017). Additionally, there are still significant barriers to accessing the administrative process needed to even receive a title for land, which is compounded for historically marginalized populations like Indigenous.

Indigenous territorial sovereignty is affected by a variety of issues—including resource speculation and new settlements after land reform. But state-sanctioned mining, largely by international private mining corporations, has been the most fraught. From 2000 to 2016, Peru's GDP growth and economic health was the best in Latin America, lifting millions of people out of poverty and decreasing inequality by objective measures (Lust, 2019; *Peru Climate and Development Report: Executive Summary*, 2022). In fact, poverty fell from 59 percent in 2004 to 20 percent in 2019 (INEI, 2022). However, much of this growth was predicated on a mining boom that made Peru the second largest copper exporter in the world, among other mining accolades (Arce, 2014; A. J. Bebbington & Bury, 2009). Mining was held up as Peru's ticket to post COVID economic recovery, which has fostered additional anti-extraction movements within both the climate change and COVID recovery spaces. International mining companies who hope to exploit Peru's deposits of resources—from copper to gold to hydroelectricity—are granted concessions that easily give them access to lands that rightfully belong to Indigenous peoples. For example, the Las Bambas mine—the largest mine in Peru—earned a 35,000 hectare concession with an estimated 18 year active period in order to double copper production in Peru. These property rights are also protected by bilateral agreements with the home country of each mining company and the World Bank's Multilateral Investment Guarantee program, making their ownership even more concrete and efforts to reclaim ancestral territories taken over by mining companies even more difficult (De Soto, 2000). However, mining constitutes a threat to Indigenous peoples and Indigenous women in particular because women "defend life for future generations" and

in practice, Indigenous people are not afforded the right to consent to extractive industries in their territories ("Sembrando vida," 2021; TVPerú Noticias, 2022). As a result, the Quechua communities in Apurimac and Cusco who live near the mine have been engaged in active resistance, saying they were not consulted or given the opportunity to consent to the project and evaluate its environmental and social impacts (Oxfam, 2016).

Territorial sovereignty, land rights, and mining map directly onto adaptation planning. Without territorial sovereignty, Indigenous communities are unable to control the contamination, violence, and dispossession that undermines their adaptive capacity. For example, climate change may cause changes to the water cycle, while mining tailings contaminate the limited water that continues to be available (Silva Santisteban, 2017). This is particularly important for Indigenous women, who have a unique relationship with the land that stems from their self-stated positionality of "guardians of Pachamama" (Gobernanza, 2021a)

2.2 Indigenous women's organizations and embodied connection to territory

In Peru, Indigenous women often frame broader territorial self-determination around their rights to "body as territory." This means that Indigenous women's organizations are able to frame collective, community-based concerns about dispossession and sovereignty in terms of the effects on women's bodies in particular (Mundim, 2021). Indigenous women's unique relationship with land manifests through reproduction, traditional knowledge of medicinal herbs and plants that nurture and heal communities, and their role as defenders of land and biodiversity who resist structural

and physical violence caused by colonization and colonial institutions (Cusicanqui, 2010; Mundim, 2021; Radcliffe, 2015). As a result, women can show that land is the source of life itself and is the space in which "relationships and identities are woven and transmitted to new generations" through the bodies of women (ONAMIAP, 2017). Although scholars argue that reducing collective rights to territory can be harmful for Indigenous women living outside of their ancestral lands (Cusicanqui, 2010), territorial sovereignty is inseparable from the right to adapt to climate change in a just and culturally appropriate way.

One of the most pervasive threats to Indigenous women's bodies, territorial sovereignty, and lives is resource extraction—which occurs in Andean and Amazonian Indigenous territories alike (A. Bebbington & Bury, 2013). Mining in particular has deleterious health effects on Indigenous women. For example, a study by Amnesty International found that the Kana community outside of Cusco, located near the Swiss-English Glencore mine, had elevated levels of arsenic and lead in their systems (IPS, 2021) both of which can negatively affect pregnant women and their fetuses. The Las Bambas copper mine, owned by the Chinese mining company MMG, caused damage to Indigenous women in particular, damaging Indigenous rights and claims to body as territory (D. Olmo, 2022; Leinius, 2021). When extractive activities threaten Indigenous women's relationships with land, research finds that women often employ everyday "stay put" and "carry on" techniques rather than engaging in spectacular acts of resistance (Jenkins, 2017, 2015). This shows that the long history of violence against Indigenous women and communities is not new, Indigenous women experience territorial destruction

in a material way, and Indigenous women's organizations must remain vigilant in order to prevent these logics of dispossession and erasure from becoming embedded in adaptation planning.

This specific relationship to land as body-territory is also highlighted through the process of climate change adaptation, in which threats to territorial sovereignty beget adaptation challenges that are an extension of the violence already being committed against Indigenous women. Indigenous women's organizations in Peru argue that Indigenous women across the country have a unique relationship with land, and therefore a vested interest in resisting adaptation planning that undermines their demands and ability to adapt. Indigenous women therefore center their bodies in national adaptation planning through conversations about reproductive issues, death, illness, symptoms, food, medicine, and emotions, which Indigenous women frequently connect to environmental issues (Moreton-Robinson, 2013; Perreault, 2013; Radcliffe, 2015; Zaragocin & Caretta, 2021). Indigenous women's activism at the national scale makes embodiment legible to the state, researchers, and NGOs who might otherwise ignore this gendered issue.

Many scholars have critiqued gender mainstreaming, a key element of Peru's adaptation planning process, since it does not address the other identities that co-constitute gender—such as race, ethnicity, age, geography, and ability (Alston, 2014; Arora-Jonsson, 2011b; Daoud, 2021). The literature on climate change and intersectionality offers an alternative to gender mainstreaming (Amorim-Maia et al., 2022; Kaijser & Kronsell, 2014; Thompson-Hall et al., 2016) and research on the political representation of Indigenous women in Latin America has considered

intersectionality through the lens of "inclusive solidarity," in which marginalized communities coordinate demands to counter shared structural inequities (Ewig, 2018; Rousseau & Ewig, 2017). However, the literature on climate change and intersectionality has not considered land as a key element of embodied identity, and therefore adaptation planning, for Indigenous women.

Peru has seven main national organizations who represent Indigenous and peasant interests, including two large Indigenous women's organizations who interface with the state and multilaterals (see Figure 8 for a list of organizations who are active in framing Indigenous women's role in adaptation planning). These organizations represent people who identify as Indigenous women living in multiple geographic regions of the country and with diverse identities. Importantly, Indigenous women hold shifting and multiple subjectivities depending on other intersectionality nodes of identity, but this plurality of identities under the umbrella of "Indigenous women" is brought together under a centralizing message by Indigenous and Indigenous women's organizations for the purposes of interfacing with the state and multilaterals.

Organization Acronym	Name of Organization	Role in Adaptation Planning
ONAMIAP	National Organization of Andean and Amazonian Women of Peru	Indigenous women's organization; Representative in international meetings like the COP; directly consulted by the state in adaptation planning
FENMUCARINAP	National Federation of Peasant, Artisan, Indigenous, Native, and Salaried Women of Peru	Indigenous women's organization; directly consulted by the state in adaptation planning
CHIRAPAQ	Center for Indigenous Cultures of Peru	Representative of Peru's Indigenous communities and women in national and international culture and rights discussions

Figure 8: Indigenous and Indigenous women's organizations involved in adaptation planning

2.3 Transformative adaptation and resistance

NAPs are also spaces where states and multilaterals have committed to mainstreaming gender and other marginalized identities into climate action. The NAP Global Network and International Institute for Sustainable Development, for example, require a gender component of the NAP in order to support a country's planning process, as does the Green Climate Fund Readiness Program. As a result of this increased focus on difference and marginality, nearly 1/3 of all nations that have established a formal NAP now have gender-responsive climate change adaptation plans, whereas in 2018 there were none (NAP Global Network, 2022). But limited research has been conducted on the distinct priorities that emerge at the intersection of gender and Indigeneity within the emerging national adaptation plans that focus on gender. Instead, scholars have focused on the transformative potential of adaptation planning that takes difference and marginality seriously (Few et al., 2017; J. Ford et al., 2016; Holler et al., 2020; Nightingale et al., 2022; Quealy & Yates, 2021; Thompson-Hall et al., 2016), gender responsiveness and mainstreaming (Chingarande et al., 2020; Gonda, 2019; Holvoet & Inberg, 2014; Nagoda, 2015; Shabib & Khan, 2014; Singh et al., 2021; Wester & Lama, 2019), and the scalar politics of national adaptation policies (Ojha et al., 2016; Tschakert et al., 2016).

This focus on NAPs as mechanisms to redress historical harms wrought through colonialism, gender discrimination, and ongoing extractive activities is a burgeoning area of study that has implications for the transformative potential of transnational adaptation planning (Amorim-Maia et al., 2022; Colloff et al., 2017; S. H. Eriksen et al., 2019;

Persson, 2019). However, few studies have examined the ways that gender and Indigeneity are leveraged by multiple different actors to negotiate adaptation priorities, as well as their consequences for the adaptive capacity of marginalized communities.

This study highlights the role of resistance in global adaptation planning efforts. In particular, I show that Indigenous women demand territorial sovereignty as a precursor to gender and culturally responsive adaptation, thereby resisting adaptation as usual and empty narratives of representation. Scholars have shown that resistance to adaptation planning can show up in a myriad of ways that range from opting out of local adaptation projects to subverting discursive frames (Arnall & Kothari, 2015b; Camargo, 2022; Henrique & Tschakert, 2019; Mills-Novoa et al., 2022; Paprocki, 2022). This study builds on the work of Mills Novoa et al.'s (2022) study based on Katz's (2004) typology of resistance. They show that agrarian communities are active agents in adaptation plans and projects who resist, leverage, and rework projects from below. In particular, I show that Indigenous women are 'reworking' historical and ongoing threats to territory—particularly around mining—to push the state to see territorial sovereignty as vital to Indigenous women and communities' adaptation futures.

Scholars have also noted that when international NGOs or multilaterals are involved in adaptation planning, they dramatically shape the boundaries of representation (Ojha et al., 2016), sometimes going so far as to depoliticize the representation of marginalized communities to forward a particular vision of equity and transformative change (Mikulewicz, 2020b). In the case of Peru, the NAP focuses on gender, multiculturality, and intergenerational concerns based on the guidance of international

NGOs like the NAP Global Network. However, Indigenous women exist this too-easy framing by continuously redirecting the state towards land and territorial sovereignty. Research on participation in adaptation planning shows that representation alone doesn't lead to desired outcomes for marginalized communities (Holler et al., 2020). I argue that it is not transformative to simply include Indigenous women in the "dialogue" process of the NAP. Instead, land and resource control should be key components of gender-responsive adaptation planning, which many nations shy away from.

3. Methods

The data collection process was multi-pronged and took place over the course of two years, from late 2019 to early 2022. This period of time corresponded with Peru's national adaptation planning process, and generated an abundance of testimonies, documents, videos, and media related to gender, Indigeneity, and climate change adaptation. I systematically analyzed hundreds of pages of documents, as well as videos and social media, to determine how gender and Indigeneity were leveraged by the Peruvian state and multiple actors throughout this process. The materials either provide historical context and input for the 2021 National Adaptation Plan or its antecedents, give context and details for the process of creating the plan itself through stakeholder participation, or engage with the actual plan itself and how Indigenous women's organizations, multilaterals, and state agencies envision implementation—including projects, policies, and laws—that results from the NAP (see Figure 9). As a result of COVID, the majority of the process of finalizing the NAP was held remotely. Therefore,

I had access to webinars and public information sessions, as well as separate webinars and organizing events held by Indigenous women's organizations in Peru.

Peruvian State & Ministries	Indigenous Women's Organizations	Multilaterals & NGOs
• National adaptation plan (NAP) • Ministry of Environment (MINAM) led webinars • Press releases and official announcements • Media coverage of state-led adaptation planning (national newspapers El Comercio and La República)	• Webinars led by Indigenous women's organizations (mainly ONAMIAP) • Short video testimonies from Indigenous women's organizations • Social media photos, text, videos • Media interviews with leaders of Indigenous women's organizations • Institutional reports gathered in Lima, ONAMIAP and Chirapaq • Personal interview with Melania Canales, ONAMIAP (Lima, July 2022) • Personal interview with Newton Mori, Chirapaq (Lima, June 2022)	• Institutional reports (Oxfam, International Labour Organization, Flora Tristan, UN Women, CARE, USAID) • NGO-led webinars and videos (some co-sponsored with MINAM) • Institutional blog posts and media

Figure 9: Summary of collected documents and interviews (2019-2022)

In addition to document collection, I conducted interviews with Newton Mori from the Indigenous organization CHIRAPAQ and Melania Canales Poma, the former President of the Indigenous women's organization ONAMIAP. These interviews included targeted questions that were created to follow-up on the first pass open-coding that I performed on the documents I collected through May 2022.

The analysis for this paper involved a systematic review of all collected documents using Maxqda. I used a thematic analysis of the language around gender, Indigeneity, and

adaptation (Saldaña, 2015) to address power relations related to participation, as well as ideological and epistemological asymmetries and intersections (see Ojha et al., 2016). Through this analysis, I found that the NAP is contested, leveraged, reworked, and supported in surprising ways, and this paper is an attempt to elucidate one of them: how gender and sovereignty intersect in adaptation planning.

First, I used MAXQDA to identify how three different actor-umbrellas—state agencies, multilaterals and NGOs, and Indigenous and Indigenous women's organizations—described gender and Indigeneity in relation to climate change adaptation. I performed a grounded thematic analysis to try to understand the different discourses, assumptions, requests, and subtexts that were present both within multilateral and state organizations discussing gender and Indigeneity, as well as within Indigenous and Indigenous women's organizations themselves. I was specifically looking for discourses that repeatedly expressed a particular standpoint or set of practices relevant to climate change adaptation, gender, and Indigeneity. After I had established code groups from grounded coding of key representative documents, I established patterns inside the code groups. I also tagged key demands of Indigenous women's organizations and identified those that were mentioned most frequently.

Within this process it became clear that territorial sovereignty needed to be included as a major focus due to its obvious presence and frequency in women's language, and its glaring absence in the NAP and state organized webinars and documents. Indigenous women's organizations in particular describe gender as inseparable from territory—where adaptive capacity and adaptation knowledge are always created in relation to a

place, rather than through sustainable development or technical solutions. The following sections are organized by the main ways that the state and Indigenous women's organizations leverage gender and Indigeneity in adaptation planning: Indigenous women's demands for territorial sovereignty, the connection between mining and adaptation for Indigenous women's bodies, the state's vision of 'adaptation as usual' despite attempts to address difference, and possible visions of the future.

4. Findings

In the following sections, I discuss Indigenous women's adaptation politics as well as state and multilateral visions of gender and culturally responsive national adaptation planning. I conclude with evidence of Indigenous women's use of adaptation planning as a liberatory framework for territorial sovereignty and a discussion of the global implications of this case study for transformative national adaptation planning.

4.1 Indigenous women's demands: territorial sovereignty for just adaptations

For Indigenous women's organizations, adaptation planning is propelled by sovereignty, which reaffirms Indigenous women's commitment to adaptation in relationship with a place[2]. Melania Canales, the former President of the Indigenous

[2] Within these organizations there are several women who are called on by international Indigenous organizations more frequently, and who have become spokespeople for Indigenous women in terms of adaptation planning. The primary person in this camp is Melania Canales, who is a Quechua woman from Ayacucho, Peru. She was the former president of ONAMIAP, a former leader of the Rukanas Quechua group in the Lucanas district of Ayacucho, and is currently the leader of Continental Network of Indigenous Women in the Americas for the South Region (ECMIA Sur). Two other prominent leaders are Tarcila Rivera of the Indigenous cultural organizations CHIRAPAQ, who is a Quechua woman from Ayacucho who has had an active multi-decade tenure as the organization's president and an international thought leader around Indigenous and Indigenous women's rights, and Lourdes Huanca, an Aymara woman from Puno who is the head of the National Federation of campesina, artisan, Indigenous, native, and salaried women (FENMUCARINAP).

women's organization ONAMIAP (2019-2022), notes that: "Climate change is going to affect Indigenous women above all and to attend to this problem, we have to talk about the right to territory" (TV Peru, 2019). Melania also connects Indigenous women's environmental expertise to land, saying that "Indigenous communities and indigenous women have a special relationship with the earth and territory. Territory is part of our life itself, from there we develop our medicine and ancestral knowledge, and for women this is something special. Without the earth/territory, there is no life" (TV Peru, 2019). Other leaders of Indigenous women's organizations echo the specific relationship that Indigenous women have to place, and therefore to climate change adaptation that begins with territorial sovereignty. For example, Aurora Coronado of FENMUCARINAP notes that women are the ones who are forced to adapt the most to climate change because of their constant connection with food and medicine cultivation. Therefore, they are the ones who and who protect "the home and economic life" through their understanding of land and connection to place.

Indigenous women have a history of exclusion from state-led efforts to address climate change. For example, Peru's 2018 Climate Change Law included no mention of gender or free and informed prior consent for conducting projects on Indigenous lands that would undermine sovereignty. This exclusion pushed Indigenous women to "step up their vigilance" in the process of creating the national adaptation plan (Canales Poma, personal communication, July 4, 2022; "ONAMIAP," 2020b; Silva Santisteban, 2017). Mayra Macedo, an Amazonian delegate from ONAMIAP, participated in the Peruvian Ministry of Environment's "*Dialoguemos*" process prior to creating the NAP. This

process, which translates roughly to “let’s have a dialogue” in English, was created to encourage non-state actors to participate in climate change discussions and have their interests heard. Mayra criticized the state for not taking seriously free, prior, and informed consent, and for seeing mere attendance and participation at this event as a proxy for consent. She said “Regarding the proposals of the Indigenous peoples, clearly women must be included in this dialogue. We would like effective participation. That is, with voice, vote, and decision making. Although it is true that they have us participate, our contributions are of no use because they do not take them into consideration” (Lucía Nuñez & Romero, 2019). Melania Canales said that adaptation planning processes are not decisionmaking spaces. She said “we [ONAMIAP] would like to say go to hell, certainly, but we are here because we want to keep supporting because even though it’s a space where they do not even listen to you, our position is that we keep showing up” (M. Canales Poma, personal communication, July 4, 2022). This shows that Indigenous women are aware that participation is not sufficient, despite the fact that the state has focused on increasing the representation of Indigenous women and communities in climate discussions.

Territory is at the center of Indigenous women’s agency, resistance, and defense of the earth, and Indigenous women’s organizations show that colonialism drives both climate change and the state’s refusal to address territorial sovereignty in adaptation planning. Indigenous women note that colonization has interrupted the ability to adapt their own science and technology to rapidly changing environmental conditions, thus creating vulnerability that extends into climate change adaptation (ONAMIAP, 2022).

Representatives on a webinar about land and Indigenous women that was held by ONAMIAP said "women will continue defending mother earth with their very lives" "national norms have legalized dispossession" and "we are resisting the genocide that began with colonization" (ONAMIAP, 2021). In the video "Indigenous women in the Indigenous peoples platform for confronting climate change," Aurora Coronado said that public policy needs to come from the country to the city, rather than the other way around, in order to truly reflect the lived experiences of Indigenous women (Gobernanza, 2021b). This means that the colonial legacy of violence against Indigenous women, peoples, and territories must end in order for adaptation to be possible.

Indigenous women's organizations articulate a series of adaptation demands based on the idea that territorial sovereignty is key for adaptation, mere political representation of women and Indigenous people does not let the state off the hook, and colonialism undergirds many of the threats to Indigenous women's adaptive capacity. Figure 10 shows a list of these ten demands as articulated in the documents that I collected for this research. The top four demands were most frequently repeated and will therefore be elaborated on.

Indigenous women's demands for just climate adaptations
• **Right to territorial sovereignty and juridical security of Indigenous territories** • **Address territory from an integral lens rather than fragmenting ecosystems and people** • **Establish the Ley de Madre Tierra (Law of Mother Earth) to protect both land and lives** • **Create public policies that come directly from Indigenous women's lives** • Guarantee the right to collective territory • Stop criminalizing Indigenous land defenders, especially women • Recuperate, revitalize, revalorize ancestral knowledge, science, and technology • Facilitate and strengthen food sovereignty and women's agriculture • Stop supporting agribusiness and agricultural monopolies at the expense of smallholders • Political representation and a plurinational congress that better represents Indigenous demands and interests

Figure 10: Summary list of Indigenous women's demands for climate change adaptation

4.2 Extractive activities and disruption of territorial embodiment

Indigenous leaders in Peru have long cited mining, oil and gas extraction, and heavy metal contamination as being particularly destructive to women's bodies, their reproductive systems, and in turn, their children, which perpetuates an intergenerational cycle of social and environmental harm (LR, 2021; *Mujeres peruanas se une*, 2020). Indigenous women refer to themselves as "*portadoras de la vida*" or carriers of life (Silva Santisteban, 2017) which means they also translate environmental chemicals to their children through pregnancy and nursing (Cooperacción, 2020; *Amnesty International*, 2020). For example, scientific studies have shown that women's reproductive systems are highly sensitive to heavy metal contamination, and high concentrations of metals and persistent pollutants can translate into breastmilk. This is an issue for communities who are located near rivers contaminated with mining tailings, for example, or near roadways where large mining trucks produce dust and contaminate the air by traveling through

small villages by the hundreds. Mercury or other mining drainage can accumulate in fish and water supplies (Duke University, 2020; Moeys, 2020) and copper mining can drain water supplies that are already threatened by changes to precipitation, groundwater, and glacier runoff—particularly in the dry Southern Andes (Imfeld et al., 2019; Vega-Jacome et al., 2020). Indigenous women leaders note that if the embodied expertise of Indigenous women was taken seriously, extractive activities that undermine both life as it is *and* adaptation potential would be considered unethical, rather than being tied in with Peru's economic growth potential and sustainable development.

This defense of life and territory is often a fight against extractive activities that contaminate rivers, dispossess communities, and lead to heavy metal poisoning in the bodies of Indigenous people, and especially women and children. In addition to mining protests, a group of women from the Awajún community in the Peruvian Amazon confronted representatives from the Ministry of Energy and Mines in 2021 during a protest and blockade, demanding environmental remediation for their communities, which have been affected by ongoing oil and gas extraction (GrupoRPP, 2021). Importantly, Indigenous women are frequently persecuted for defending their land and territory, which constitutes another threat to bodily health. They are "persecuted, stigmatized, killed, assassinated, and criminalized" (Canales Poma, personal interview 2022) in Peru and beyond.

State-sanctioned extractive activities, like mining, are further undermining territorial sovereignty and creating a double-bind for Indigenous communities who are adapting both to climate change and suffering from ongoing mining activities that

primarily occur on Indigenous lands. The state does not address land concessions for mining in the NAP despite its focus on gender and Indigeneity, and despite the fact that Indigenous women say that extraction and dispossession are the main threats to their adaptive capacity (M. Canales Poma, personal communication, July 4, 2022). These extractive activities are an extension of the colonial processes that Indigenous women in Peru resist in climate change adaptation planning based on their unique connection to land as "carriers of life" and "guardians of Mother Earth." For example, an Oxfam report called *¡Sin Mujeres Indígenas, No!* noted that, "Extraction projects can put the livelihoods and food security of women at risk, can create large problems with health and security for women, increase unremunerated work for women, and undermine the condition of women in homes and communities" (*Oxfam*, 2019, p. 7). This is further compounded by the physical and sexual violence committed against Indigenous women when mining camps are present (*Oxfam*, 2019) and the persecution that Indigenous women face when they defend their territories against these powerful interests.

Indigenous women's demands to reduce extractive activities and enhance adaptive capacity through territorial sovereignty are challenged by Peru's reliance on natural resource extraction. Peru is the second largest exporter of copper in the world, which primarily comes from foreign mining companies acting on Indigenous lands (World Bank Group, 2022). Mining comprises 65% of Peru's total exports and around 10% of its GDP, and recovery from the COVID 19 pandemic relied on mining continuing during the quarantine and increasing production following Peru's long lockdown (World Bank Group, 2022). Mining continued to operate during quarantine and is the foremost

priority put forward by the state in Peru's Economic Reactivation Plan (ONAMIAP, 2020). Indigenous women's organizations say that despite the importance of mining to Peru's economy, it is anathema to their adaptive capacity (Canales Poma, personal communication, July 4, 2022). Adaptation is not possible if lands are being invaded by mining companies who have third party titles to the land that are sanctioned by the state (Canales Poma, personal communication, July 4, 2022).

These extractive activities are increasingly connected to climate change mitigation efforts and global green economies, since copper is used in many technologies that generate renewable energy. However, large-scale copper mines cause locally maladaptive effects, as Indigenous women make clear, in the service of global mitigation through a green economy. For example, copper is used for everything from wind and solar to electric vehicles. Additionally, "green mining" based on the demand for renewable energy is key to economic growth in Peru, with copper making up 1/3 of the nation's total exports and global demand for Peru's nickel, cobalt, and lithium stores on the rise (World Bank Group, 2022). The World Bank (2022) notes that "Higher copper demand and prices represent a significant opportunity for Peru, the world's second largest producer, especially if it can expand copper production." However, it also acknowledges that there is a "challenging mix of complicated permissions and community conflicts" and that "addressing these would allow the sector to fulfill its potential." By way of example, recent protests in Quechua communities outside of Cusco and Apurimac temporarily shut down major mining operations by the Chinese company MMG at Las Bambas, with other mines in the Cusco region affected as well. Protestors in the Cusco

area, who were largely Quechua, underscored the need for a consent process with the affected Indigenous communities before a new proposed mine is created ("Las Bambas," 2022). Experts and Quechua women in the region testified that their plants and animals were dying, and their children were coming down with a number of new health ailments (ONAMIAP, 2020a; *Oxfam*, 2016). There is therefore a tension here between Indigenous women's ability to adapt in Peru through territorial sovereignty and the global demand for metals to mitigate climate change.

When I asked Melania Canales about ONAMIAP's climate change proposals, she immediately began to talk about juridical security and the right to collective lands on Indigenous territories. She said that, "Extractive activities destroy life through contamination, and we have to defend against this above all else…It is there [territory] that we raise our cattle, that is where our medicinal plants are, above all they come in and destroy everything living." She went on to connect this to climate change by saying that the acceleration of climate change has forced people to think about the world in a fragmented way—for example, by just focusing on Amazonia as a carbon sink for climate change. In contrast, she said that Indigenous women demand that people in charge of adaptation start seeing the world in an integral way, "Better said, it is not possible to just think about forests without thinking about glaciers, glaciers are what irrigates forests because they also go to Amazonia…it's also not possible to not think about the ocean. It is not just about thinking about this one place, Amazonia, you also have to think about the mountains and the coast and the sea" (M. Canales Poma, personal communication, July 4, 2022). This disrupts the focus on adaptative capacity for

Indigenous woman as a separate issue from extraction. According to Melania, this fragmented view of territories as singular entities rests on the same logic that allows for extraction, since it is not possible to adapt when lands are being invaded (M. Canales Poma, personal communication, July 4, 2022). Newton Mori underscored this by telling me that the Andes are still marginalized during climate change adaptation discussions since most of the focus and attention goes to the Amazon. This means that the connection between climate change adaptation, mining, and even agriculture is often missed in focusing on the Amazon as the lungs of the earth and preventing deforestation.

4.3 State and multilateral vision of adaptation planning

In Peru, the NAP is led by the Ministry of Environment (MINAM), which aimed to make the process highly participatory and inclusive of members of civil society, including Indigenous and Indigenous women's organizations. Gender is one of the three cross-cutting focuses of the NAP—the other two focuses are intercultural and intergenerational welfare— and focuses on recognition of gender differences in adaptation needs and capacities, gender-equitable participation and influence in adaptation decision-making processes, and gender-equitable access to financial resources and other benefits resulting from investing in adaptation. The state positions these cross-cutting focuses as more equitable than thinking about national populations at large.

Given that the Peruvian government has worked closely with multilaterals to fund, shape, and execute the NAP process, multilateral priorities for discussing gender, race, and land are also interwoven with state conceptions of these issues. The United

Nations and the United Nations Framework Convention on Climate Change (UNFCCC), for example, is a driving force around the language used in climate adaptation documents and planning. Although these entities have different goals in climate change adaptation, they all fund projects that tend to have the common goal of promoting sustainable, "resilient" development and reducing vulnerability for women (LEDS LAC, 2019), often through capacity building or access to property and credit. There is also a large focus on building women's resilience, especially through food production and the security that this provides the planet and developing nations. "Object populations" for adaptation interventions are difficult for the state to accurately identify outside of major categories of difference, like the gender binary and poverty status (Chirapaq, 2017a; N. Mori, personal communication, June 21, 2022). Therefore, the valences of poverty and development are often used as a proxy for provisioning services to Indigenous communities. This connects race and gender to poverty as a node of visibility, and to markets and access to credit as a solution, which Indigenous women are trying to draw attention away from as a colonial system of thought.

There is no clear discussion of land and territorial sovereignty in the NAP. Out of nearly 100 mentions of territory in the NAP, gender is only mentioned in tandem with territory when referring to geographic spaces in the abstract, such as "groups of women responsible for their territories and collective organization" (MINAM, 2021, p. 251). The NAP itself defines Indigenous or original communities as "communities that descend from populations that have inhabited the country in the period of colonization and that, regardless of their juridical situation, retain their own social, cultural, and political

institutions, or parts of them, and who at the same time self-identify this way " (MINAM, 2021). Here, the NAP sidesteps discussions of territorial sovereignty that Indigenous women put front and center, and instead focuses on "social, cultural, and political institutions" which are not as threatening to the state. When the NAP discusses "territorio/territory" it refers to "our territory" or "Peru as an adapted territory", thereby connecting land back to collective national identity rather than Indigenous sovereignty. Importantly, land tenure and property titles are only mentioned in tandem with Indigenous communities in the "forests" section, which tends to only include the Peruvian Amazon and leaves out Quechua, Aymara, and other Indigenous communities and people in the Andes and in coastal regions of the country.

Often, the NAP refers to titling rather than sovereignty. Moreover, gender is never paired with a discussion of land unless land is referred to as a movement towards property titling. For example, the NAP says that barriers to participation come from lack of access to legally sanctioned land titles, and hence decision-making power that comes with official land claims. There is frequent mention of gender gaps in land ownership, mentioning that only 21% of women have access to land, compared to the 79% of men, and 20% of agricultural units are directed by women, but only 5% have a property title for these units." Later on, the NAP notes that the "exclusion of women in decisionmaking in the agrarian space is because of the lack of property and land tenure that they have"(MINAM, 2021). Again, this does not discuss the larger forces that cause the state to prioritize industrial agriculture while at the same time holding up women as the face of small-scale, traditional agriculture in the country. This is a theme in the NAP, where

structural and historical discrimination, especially against women and Indigenous people, is acknowledged in a basic way, but the role of the State in these processes is kept conspicuously absent through abstract language.

Peru positions its stance on climate change and its processes of creating state-level plans and norms around climate change as a point of national pride. For example, Peru was the first South American nation and the 19th country in the world to establish a gender action plan for climate change (*MINAM*, 2016). Peru is a signatory to the Paris Accords, among other major climate agreements, many of which identify the Amazon as a key ecosystem of interest for global climate resilience. Additionally, Peru is seen as having made greater strides towards gender equality in the last decade than other Andean nations—such as Ecuador, Bolivia, and Venezuela (*Gender Gaps in Peru*, 2018). According to the IUCN, which funded and facilitated Peru's Gender Action Plan for Climate Change (PAGCC), Peru is a regional leader for women's legal and de facto access to credit and property. It was also the first country in Latin America to approve a national climate change law, the first to ratify the Paris Accords, and hosted COP 20 in Lima—which was a pivotal international meeting for establishing norms that facilitate gender mainstreaming into climate change adaptation (*Estrategia Nacional Ante El Cambio Climático*, 2015). All of these points of pride have helped Peru attract funding and international support for its adaptation plans and practices, but has not strengthened the connection between gender, Indigeneity, and land that Indigenous women say would meaningfully affect their adaptative capacity.

The state did establish CONAMUCC (National Committee of Women and Climate Change) and PPICC (National Indigenous Peoples Climate Platform) under President Martín Vizcarra in 2020 leading up to the process of formalizing the NAP (*PPICC*, 2020; *MINAM*, 2020a). This is often championed as a win for the state, with both committees held up as transformative efforts by the state to include women and Indigenous people in major state-based programming efforts around climate change (*MINAM*, 2020a; *MINAM*, 2020b). This platform is important for the state and Indigenous and Indigenous women's organizations alike, since it serves the purpose of inclusion (on the part of the government) and visibility (for Indigenous women's organizations). However, the very existence of separate committees for women and Indigenous people to address national level climate change planning underscores the deep lack of intersectionality in the state's organizing processes.

Significantly, frequent changes in leadership at the national level in the last decade have left many of these efforts hanging. Multiple changes in government over the past six years have affected the institutional continuity of both priorities for the NAP and as well as implementation, a phenomenon that scholars have noted in other nations as well (Pardoe et al., 2020). For example, the PAGCC was all but abandoned in 2016 due to a change in government that left these good intentions behind (Silva Santisteban, 2017) and the Peruvian government has churned through eight ministers of are simply symbolic because they either do not have their own dedicated funding streams or are not connected to concrete public policies that outlast changes in administrations. This betrays the Peruvian state's commitment to the status quo despite its nod to inclusion in the national

adaptation planning process. Presidencies come and go, but the commitment to granting mining concessions for subsurface mineral rights has remained since the early 2000s.

4.4 Reframing adaptation through gender and sovereignty

There is a clear disjuncture between the way that gender, Indigeneity, and territorial sovereignty are viewed by Indigenous women's organizations, the Peruvian State, and multilaterals in formal adaptation planning efforts. Despite this, Indigenous women's organizations are leveraging the NAP process as a way to establish continuity of the argument for territorial sovereignty across political platforms and issues, especially through the lens of gender and resistance to extractive activities occurring on Indigenous lands.

Indigenous women end up having to resist this narrative that the state granted participation, and that participation is sufficient. Instead, they use territorial sovereignty to show the failures of the state's view of intersectionality and gender mainstreaming in adaptation planning, noting that territorial sovereignty is now more critical than ever given the climate, health, and food crises that have besieged Peru in the last five years. A representative of CHIRAPAQ noted that a more simplified focus on gender—rather than considering Indigeneity and sovereignty as always intertwined with gender— is much easier for the state to grasp. This is due to the strong gains and visibility of the feminist movement in Peru over the course of the last 50 years (N. Mori, personal communication, June 21, 2022). He noted that in reference to interculturality, the state is only able to provide services, it is not interested in redressing structural issues that lead to racism,

discrimination, and vulnerability for Indigenous and Afro Peruvians, and is therefore less able to deal with the structural barriers related to Indigenous women's adaptation initiatives. Really, the state should be striving to create a different relationship, one that is more horizontal, between Indigenous communities and the state. But it is not "structured to address this" (N. Mori, personal communication, June 21, 2022).

Indigenous women's organizations also consistently call on the state to step up and implement public policies that align with their vision of a securely adapted climate future. In an interview on TV Peru, Melania Canales called on regional and local governments in particular to implement public policies and reforms, since they have a better understanding of the local contexts of adaptation than the national government does. However, she notes "We can dialogue with the state. But at the end of the day, it's the state that decides" (TV Peru, 2019). Indigenous women therefore "call in" the state rather than treating it as the enemy, highlighting their fundamental exclusion from the state and public institutions as a legacy of colonialism and capitalism.

In addition to pushing on the state, Indigenous women's organizations in Peru resist the references to sustainable development goals that are ubiquitous in both the NAP and the rhetoric of multilaterals who fund adaptation planning. ONAMIAP says that out of the UN's 17 Sustainable Development Goals and 169 targets, only four targets meaningfully and explicitly include Indigenous people, and there are no goals that specifically reference the role of Indigenous women in the sustainable development process (Canales Poma, 2019). Melania Canales also resists claims that development, from the perspective of multilaterals and the state, is a normative good. She says that "we

don't need development, we have our own development" and underscores this by noting that the whole vision of development comes from the outside and does not uphold Indigenous sovereignty (IWGIAtube, 2022). This pushback against sustainable development as envisioned by multilaterals and the Peruvian state is significant, since it forms the backbone of the roadmap and justification for the NAP. With a more expansive and grounded understanding of sustainable development that addresses Indigenous women and their territories, adaptation planning could not so easily sidestep extractive activities, which are simulaneouly spotlighted as key to reducing poverty and major barriers to just adaptations.

Mining is one of the main areas that Indigenous women have targeted for continuity of messaging around adaptive capacity. The World Bank's recent Climate and Development report (2022) noted that, "Peru can benefit from decarbonization policies, leveraging its forests, clean electricity (over 60% renewable), fertile land and vast copper resources to be a leader in a global low-carbon transition. By controlling deforestation and decarbonizing transportation, Peru can drive growth through sustainable agricultural and copper exports, while bringing long-term development benefits to the population." Indigenous women's organizations have resisted mining predicated on a global green economy and sustainable development, bringing these messages and efforts into adaptation planning by questioning both the premise of sustainable development goals that do not include them and an endlessly growing economy predicated on the type of extraction that undermines adaptive capacity for the most marginalized.

Indigenous women's organizations also lead in pushing forward the *Ley de Madre Tierra* (Law of Mother Earth) which would change the language around adaptation planning to include the rights of the Earth itself, a redefinition that would be more aligned with Indigenous women's calls for territorial sovereignty. By advocating for the *Ley de Madre Tierra*, Indigenous women reframe the earth as more than just a resource, therefore resisting narratives of a normatively good "green economy" that organizations like the World Bank put forward. Melania Canales notes that since Indigenous women do not view earth as a resource, they are able to draw on ideologies of collective welfare in climate change adaptation (TV Peru, 2019). Yeni Barrientos, an Indigenous leader from the Federation of Women of the Angaeres Province, notes that, "Us [Indigenous] women live with the Earth and we see that it's hugely affected by humans, because we are not seeing Mother Earth as part of us, but rather as an object of exploitation" (Mario, 2021). Aurora Coronado continues, "The state grants property titles but [does not extend this to] territory…the rivers, the mountains, they do not grant titles for them. They only give concessions for use. There is not an integrated titling process for territory" (Programa EUROCLIMA+, 2021). Indigenous women's organizations therefore ask that land be seen in an integral manner rather than being a series of fragmented ecosystems that are separate from humans and bodies, and therefore easy to exploit. Indigenous women's embodied connection to land helps to make this point clear—any violence committed against the land is violence against Indigenous women. In effect, Indigenous women in Peru are trying to institute new language and laws to use consistently in the institutional relations of global environmental governance. They do this by positioning territorial

sovereignty as inseparable from gender, Indigeneity, adaptative capacity, and the long history of extraction on Indigenous lands.

A crucial demand of Indigenous women is to reframe gender-responsive adaptive capacity building as a step towards s*overeignty* rather than *empowerment*. Indigenous women reframe capacity building—which is generally focused on training local people to understand the physical effects of climate change and providing technical support for adaptation—to insist on the necessity of training Indigenous organizations to manage their own funds and projects, as well as the capacity to make decisions in local communities all the way up to the highest levels of government. Melania Canales noted that, "Capacity building is not teaching us how to manage our water! It's giving us the tools to manage our land and financing"(Canales Poma, personal communication, July 4, 2022). Indigenous women are therefore trying to redress the causes of background vulnerability through rights, financing, and territorial sovereignty that would give them agency over their own adaptation options, but still with financing and support from the state. Indigenous women's focus on reframing capacity building hinges on decolonization, since Indigenous women are considered to be the most vulnerable to climate change, which is caused primarily by the consumption and emissions of developed, colonial nations (Chirapaq, 2017b; Llao, 2017; Wijsman & Feagan, 2019). These narratives of vulnerability often inform the development of adaptation projects that are meant to support Indigenous women, leading to maladaptive outcomes that reinforce the effects of extraction and colonialism on Indigenous women, rather than implementing more transformative adaptation measures.

5. Conclusions and Implications

Indigenous women's organizations leverage national adaptation planning as a liberatory space to prioritize gender, race, and territorial sovereignty as central to climate adaptation rather than as a peripheral process. If adaptation planning processes can meaningfully consider gender, Indigeneity, and sovereignty, there are implications for transformative adaptation. Indigenous women's organizations articulate a concrete environmental platform and use key political junctures as liberatory spaces to make broader claims over land and sovereignty that are squarely tied in with just adaptations for historically marginalized communities. The Peruvian state sees land in a very different way and has a vested interest in continuing many of the extractive practices that Indigenous women call out as maladaptive. Through discussions of land and territory, women are ensuring that this history of exclusion is front and center, contextualizing the power dynamics between multilateral experts, state representatives, and Indigenous women. Territorial sovereignty is therefore necessary for Indigenous women to resist the perpetuation of state sanctioned violence through climate adaptation.

Women's situated knowledge, bodies, and unique connection with land put them in a place to resist efforts to continue dispossession and undermining adaptive capacity. Returning land to Indigenous women and communities would disrupt the process of national growth (predicated on resource extraction) that is lauded by the IDB and the World Bank for lifting millions of people out of poverty and greening the global economy. The Peruvian state, which often positions mining and development interests

front and center, opposes these collective benefits by refusing to meet the specific demands of Indigenous women, even while they espouse equal participation and rights for Indigenous communities, and especially Indigenous women.

This research shows that insisting on templates for incorporating gender and race into adaptation planning can create abstractions and homogenization that undermine the power of historically marginalized groups to adapt as they see fit. Indigenous women's organizations in Peru show that in order for adaptation planning to be transformative, there cannot simply be a required focus on gender, cultural differences, and intergenerational welfare. States and multilaterals who push these priorities will encounter roadblocks to transformative adaptation if the sustainable development rhetoric embedded in adaptation planning continues to prioritize economic growth through extraction at the expense of territorial sovereignty. Indigenous women say that disrupting this connection between economic growth, development, extraction, and dispossession is the absolute non-negotiable baseline for transformative and just adaptation.

Mining is one of the cases where Indigenous women have a particular stake in showing how this not only perpetuates violence, but undermines adaptive capacity According to Lourdes Huanca, transnational corporations, mining companies, and other oligopolies that operate at the international level are major barriers to Indigenous women's adaptations in Peru, given the threat to land, health, and livelihoods. Indigenous women are now calling on the OAS and other international bodies to pay attention to violence against Indigenous people.

Indigenous women's organizations also argue that this particular way of constructing environmental futures and more just adaptations is mutually beneficial for people and more than human beings across the globe. This misalignment about land limits the possibilities for transformative adaptation for many marginalized communities based on Indigenous women's principles of care for the earth and mutual liberation, which may interest scholars working with other vulnerable or marginalized communities.

In the future, cross-national approaches and comparisons about the inclusion of gender and land rights in adaptation planning are necessary to understand the barriers to including territorial sovereignty and land rights in national adaptation planning. This is especially important because Indigenous women across the globe are beginning to call the lack of attention to sovereignty out as a barrier to transformative adaptation.

IV. CULTIVATING ADAPTATION, TENDING GRIEF: QUECHUA WOMEN'S HOME GARDENS AND ADAPTATION LABOR IN THE PERUVIAN CORDILLERA BLANCA

Holly Moulton, Inés Yanac León

"I want to plant as though the world were not ending."
-*Francisca*, Shilla, Peru

1. Introduction

In August 2019, a woman named Ernestina walked through her home garden, known as a *huerta* in this region of the Andes. She pointed out desiccated patches of mint growing in corners of the *huerta* that she struggled to irrigate during the dry season, when most of the water in the irrigation canals comes from glacier meltwater and very little rain arrives. Herminia shooed away sheep by hissing through her teeth and called for her young daughter to help her gather bundles of flowering chamomile, which she would sell at the local market at 4 AM the following morning before sending her daughter to school and beginning her work at a tourist hotel at 6:30 AM. She threw a hand-embroidered *mantel* over her hat to shade her face from the sun, explaining that the sun had lowered in recent years, burning her neck while she worked, drying out her *huerta,* and decreasing the sense of joy she normally felt in her *huerta*. Against a backdrop of mountain peaks, blue sky, and clothes hanging out to dry

Figure 11: Ernestina's garden in Unchus, Peru

in front of guinea pig corrals, Ernestina said that she sold herbs to pay for school supplies for her two daughters, and that she hoped she could buy more land and a house with better access to water in the future.

Six months later in the depths of the rainy season and the COVID lockdown, Ernestina's garden glowed green in the back of our Whats App video call, but she explained through tears that the rain had only brought weeds. Her youngest daughter had just passed away in an accident, and she told me "*no tengo ganas de hacer nada, así que todo ha muerto*"/ "I don't have the wherewithal to do anything, so everything has died." In the depths of grief and the pandemic, which cut off access to the market where she sells her herbs, she could not take advantage of the wet season and get ahead of the increasingly unpredictable dry season in the Peruvian Andes, below melting glaciers, spells of hail and frost, and changing social politics of water, food, and rural life.

In the Peruvian Andes *huertas* are feminized spaces that are predominantly tended by women. Women grow vegetables, fruits, herbs, and sometimes even flowers to sell at local markets to support themselves and their families. But these elements of everyday life receive limited attention amidst the robust literature and management policies that address ice loss and resulting water scarcity and hazards in the region, which is home to the highest concentration of tropical mountain glaciers in the world (Haverkamp, 2021; Huggel et al., 2019). Women's home gardens are spaces that reflect sociopolitical debates that are larger than just ice, especially regarding climate change adaptation, health, gender, and agricultural priorities (Braga Bizarria et al., 2022; Buechler, 2016; Cody, 2019; Jehlička et al., 2019; Shillington, 2008). *Huertas* also display the geographic

connections between changes in water in the Andes and changes in agriculture and adaptation policy at the national level.

This study draws on ethnographic research in the Cordillera Blanca, Peru to reframe regional climate change adaptation in the Andes. We do this by focusing on the gendered politics of land, food, and labor that shape local Quechua women's adaptive capacity and in turn, the adaptation opportunities available to entire communities. The literature on the social dimensions of adaptation in the Andes, especially in the Cordillera Blanca, largely focuses on the effects of melting glaciers, changing precipitation, and shifting access to and quality of water for residents of the region (Carey et al., 2017; Drenkhan et al., 2015; Monge-Rodríguez et al., 2022; Motschmann et al., 2022; Stuart-Smith et al., 2021; Vuille et al., 2018). While this adaptation research is vital within the context of hazards and society, Quechua women's *huertas* are a robust source of household and community adaptation that has been overlooked by this ice and water framing. Local and community-based adaptations in the Andes are increasingly considering wetlands (Zimmer et al., 2022), small reservoirs (Crawford-Walker et al., 2018), climate justice (Huggel et al., 2020; Walker-Crawford, 2019), and ancient systems to manage water quality (Recharte, 2021). But studies that consider these issues are still far outnumbered by research that frames adaptation as hazards and risks. Additionally, there is limited attention to gendered labor in the adaptation literature at large (exceptions include Rai, 2018, 2020) and in the Peruvian Andes (exceptions include: Mills-Novoa, 2023). We show that this is a crucial area of research that unveils a major source of community resilience that is nevertheless overlooked: women's labor in *huertas*.

This article weaves together information from interviews with Quechua women across three regions of the Santa River Valley in the Cordillera Blanca, participant observation, and archival research and document analysis. We ask about Quechua women's lived experiences of adaptation and everyday life, and how these experiences intersect with political-economic struggles around gender, land, water, and agriculture in a region experiencing climate-related glacier melt, flooding, and water scarcity. We argue that Quechua women's *huertas* are sociopolitical spaces that unveil the following: 1) the social dimensions of adaptation outside of hazards and risk, 2) Quechua women's increasingly important role in adaptation labor and processing climate emotions, and 3) the broader structural injustices that play out in climate change and social policy negotiations—and how romanticizing women's labor as community carework can undermine a real desire for structural support. They are also important for women's agency and well-being. We show how attention to Quechua women's *huertas* and the climate adaptation labor that they provide reframes adaptation in regions experiencing climate hazards, unveiling structurally undermined but critical source of adaptation that is often missed.

We find that women's labor increasingly includes the burden of processing the grief of ecological and social change on behalf of entire families, which affects the physical and emotional well-being of women in the Cordillera Blanca. This affective and material labor is gendered and often invisible—taken for granted as carework— but really it is labor that absorbs community-stress and sustains life during times of interlocking crises, such as economic downturns, national political crises, and

increasingly apparent effects of climate change on local populations beyond ice loss (Carey et al., 2017; Huggel et al., 2020). However, the Peruvian state, NGOs interested in adaptation planning, and multilateral institutions do not fund these adaptation options at the scale of larger adaptations like flood prevention measures. This is both because women's voices are ignored, but also because of the highly political and gendered issues of land use and water rights that *huertas* shine a spotlight on, as well as the assumption that near-household labor in service of adaptation should be done voluntarily without external support. This means that women's labor in supporting families and communities with local adaptations remains in the shadows.

It is important to expand understandings of 'local' adaptation challenges to encompass regional, national, and global contexts and drivers, especially in regards to Indigenous women living in deglaciating mountain regions (S. Eriksen et al., 2021). Accordingly, this article assesses the adaptation burden that women in the Andes shoulder by taking several interlocking injustices into account (Sultana, 2022): climate change, national political instability, the concentration of agricultural monopolies and decreased support for local production, rising consumer prices, and COVID 19.

This research was conducted collaboratively by Holly, a PhD student with experience working on climate change and ice loss research teams in the Cordillera Blanca, and Inés, a Quechua-speaking woman from Recuay in the Cordillera Blanca who has extensive experience on international and state-funded climate and social science research projects. We are attentive to the power dynamics that surface when a white researcher from the Global North works in local communities that are on the frontlines of climate-related impacts on life itself (Godden et al., 2020; Sultana, 2021). As such, this collaborative effort is an attempt to foreground not just the expertise of women on the ground, but also the expertise and lived experiences of local researchers like Inés.

Figure 12: Holly harvesting potatoes in September 2017

Figure 13: Photo of Inés, provided by I. Yanac León

The following sections provide context on gender and agricultural labor in Peru, and how affective labor and carework are often overlooked in research and policy. The bulk of the article is then organized based on the three sociopolitical dimensions of *huertas* outlined above, which resulted from a thematic analysis of interview data and

archival documents. Finally, we end with possible policy implications for climate adaptation practitioners and government agencies.

2. Gender and agriculture in Peru

In order to show how women's *huertas* as gendered spaces for adaptation, it is important to understand that Quechua women in the Andes hold multiple and varied intersectional identities (de la Cadena, 1995; Radcliffe, 2015). We took care not to lump all women together and to instead ask about how these women would describe themselves and how their identities may have changed across time. This is important in Peru, where most people in the countryside identify as campesino (peasant or smallholder farmers) rather than *indio* or *indígena* (Indigenous) despite being fluent speakers of Indigenous languages, such as Quechua in the Cordillera Blanca. This reflects the relationship between agrarian identities, race, and class in the Peruvian highlands (de la Cadena, 1995; Orlove, 1993; Weismantel, 2001; Weismantel & Eisenman, 1998).

Investments in small scale agriculture have recently been framed as support for rural and Indigenous women in Peru. According to Manuel Ruiz of the Peruvian Society of Environmental Law (SPDA), "Women in agriculture are the guardians of biological and agricultural diversity and guaranty food security in Peru and across the world. The selection and conservation of seeds, work in the *chakra*, and even the sale of agricultural products in local markets, are activities that are found in the hands of women" (reytuerto & reytuerto, 2017). Additionally, Federico Tenorio Calderon, the former head of the Ministry of Development, Agriculture, and Irrigation (MIDAGRI), said that "rural

women are in charge of food security for their families; but also for their communities. Their role is essential for rural development" (*Agencia Agraria de Noticias*, 2021).

Despite the importance of *campesina* women for national food security, very limited monetary and policy support is directed towards women at the local level, meaning that there is slippage between discursive importance of rural and Indigenous women at the national-level and the commitment to actually enacting structural and material change. For example, a 2015 report on public spending in smallholder agriculture showed that in 2015, only 2.3% of the public budget was earmarked for smallholder agriculture, leading the authors to suggest "it's clear that interest in smallholder agriculture was ephemeral and not a sustained commitment by the state" (Boeren, 2015) an issue that affects rural women in particular due to their reliance on agriculture. Compounding this issue, this rhetoric often conflates the *chakra*—farms where potatoes and other staple crops are grown in high-altitude plots—and the *huerta,* near household gardens where herbs and vegetables are grown. However, women in the Cordillera Blanca are primarily responsible for *huertas*, whereas both men and women work in the rain-fed *chakras*.

Women, who comprise 45% of the agricultural workforce, play a central role in preserving food systems as well as household-specific food (Ministerio de Agricultura y Riego, 2015; "Perú Sostenible," 2021). There is national symbolism here that is intertwined with the complex history of race, gender, Indigeneity, and nationmaking in Peru, as well as how Peru positions itself and is positioned in the global economy—increasingly as an agricultural nation (Dudenhoefer, 2018; D. Olmo, 2023; Agencia

Agraria, 2023). Additionally, as men increasingly leave the home to provide additional sources of income for the family (for example in jobs such as mining and construction), women are have taken on responsibility for irrigation, cleaning irrigation canals, managing fields, and upkeep and construction within the home (Babb, 2018; Radcliffe, 1986; Vera Delgado & Zwarteveen, 2007; Wiig, 2013).

3. Feminized labor, affect, and climate change

Globally, feminization of agrarian labor has been described in terms of agrarian transformations (Birkenholtz, 2023), and as changing subjectivities of water access, control, and management (Lynch, 1991, 2012; Sultana, 2009) that have implications for both gender roles and management of food security. Internationally, studies of food security and women's work have shown that constraints such as a lack of remuneration for feminized labor, a lack of education, and restrictive gender roles and discrimination in agriculture have all created barriers to household food security (Sinclair et al., 2022). Yet this issue has seen limited attention in terms of its intersection with climate change and other interlocking environmental, political, and social crises in distinct geographic locales (Southard & Randell, 2022).

Gardens are considered to be women's spaces, domestic spaces, and therefore fall under the purview of social reproduction that supports the home and family alone rather than capitalist production to be supported and waged. Geographers have discussed the feminization of space within the context of kitchens, which are sites of both oppression and agency (Abarca, 2006). Typically, feminized spaces in the home have reflected

traditional and stuck out of time values that remove women's agency and undervalue household spaces as sites of something more, namely agency and power (Oberhauser et al., 2018). This study seeks to bring gardens to the fore as spaces that highlight the labor and emotions of navigating climate change alongside the current axes of social and political change in Peru.

The feminization of labor in the agricultural sector implies both a focus on this kind of work as particular to women, and also as being inferior to other types of waged work, or as being expected and voluntary rather than remunerated (Gutierrez-Rodriguez, 2014)Andean women in particular are seen as having a distinct relationship with agricultural labor, given the gendered and racialized narratives that connect rural and Indigenous women with reproduction, cultivation, and tradition (Babb, 2020; Sikkink & M., 1999). This image is leveraged by the national government in Peru, which seeks to inscribe Andean women as the guardians of rural agriculture and its connections to national identity in Peru (F. Castro, 2022; "Mujer rural," 2020), as well as to position them as leaders in the climate adaptation movement (*MINAM*, 2020), all the while undercutting women's ability to adapt and continue desired traditions by investing in mining, agricultural monopolies, and top-down rather than bottom-up climate adaptation (A. Bebbington & Bury, 2013; Gamu & Dauvergne, 2018; Leinius, 2021)..

In terms of climate change, scholars are increasingly recognizing the fact that labor is deeply embedded in daily life and emotions in ways that both transcend discussions of wages and also complicate assumptions that this "life's work" should go unremunerated (Carr, 2022; B. Castro & Sen, 2022; Rai, 2020). Feminist scholars of

climate change have also increasingly connected transformation, adaptation and emotions (Nightingale et al., 2022) by pointing towards the role of emotions in translating inner worlds that are at once personal and relational. Nightingale et al (2022, p.7) define affect and emotions within the context of adaptation as "ways of learning, experiencing, and responding to socionatural change and adaptation." This research extends affect into the realm of labor, which unveils not just social relations that are affected by environmental change, but also the efforts of women as people who shoulder affective labor. Despite the fact that care is shown to be a critical component of just adaptations at the local level (Bond & Barth, 2020) there is limited research on the affective labor that is necessary to cultivate life in a sometimes worrying, uncertain, frightening world.

5. Study site

The study sites are divided into three general areas in the Callejón de Huaylas, a river valley that is located in the Cordillera Blanca mountain range in the central Peruvian Andes. Much of the research on climate change in the region focuses on ice loss amongst the iconic glaciated peaks of the Andes and efforts to control glacial lake outburst floods that result from melting ice (Carey, 2010; Emmer et al., 2020). However, there are many towns in the region that are not exposed to glacial lake outburst floods, including the towns of Pariapata and Recuay included in this research.

Town	Number of Interviews	Elevation	Population	Closest city
Llupa	5	3508	~600	Huaraz
Yarush	3	3510	~100	Huaraz
Pariapata	3	3427 m	119 houses	Recuay
Shilla	11	3910 m	~2800	Carhuaz

Figure 14: Interview locations

Throughout the Callejón de Huaylas, climate change has caused shifts to seasonal precipitation regimes (Motschmann et al., 2020), and issues with water access and quality (Guittard et al., 2020). However, the specific effects of climate change on issues that are relevant to *huertas*—such as precipitation, water quality, and soil quality—differ based on location. This study focuses on multiple towns and villages within the provinces of Carhuaz, Huaraz, and Recuay— all of which are in rural regions where people largely engage in a combination of subsistence agricultural production and work in tourism, hospitality, or construction. In the Huaraz region, we interviewed women in the towns of Yarush and Llupa and conducted participant observation in the adjacent town of Unchus. All three of these towns are located in the Quillcay Valley about 10-15 kilometers from the regional capital of Huaraz. Irrigation canals that collect water from the Quillcay river run alongside the main road that passes through these towns, and women's *huertas* in the region are either irrigated by pulling water from canals, taking water directly from the river, or waiting for rainfall. In the Recuay region, we interviewed women from the town of Pariapata, which is on the banks of the Santa River 13 kilometers from the small city of Recuay. Finally, participants from the Carhuaz region largely reside in neighborhoods clustered around the town center of Shilla, which is located in a high elevation valley about 10 kilometers from Carhuaz.

The majority of residents of rural, highland communities in the Callejón de Huaylas identify as either Quechua or mestizo (mixed Spanish and Indigenous descent) (*INEI*, 2018). Women in all of the regions cultivate *huertas* and gather or grow medicinal herbs, but different agricultural products grow in each of the sites. Additionally, broader

challenges with water quantity and quality, access to irrigation canals, and social and political dynamics are similar but have distinct characteristics in each area. We chose field sites based on common environmental and social challenges, which were largely based on the Inés' knowledge from living in Recuay and Huaraz and from her firsthand experience with NGOs working on issues of climate change in the Cordillera Blanca, as well as the Holly's research on women's adaptations in Llupa and flood projects in the Santa River Valley.

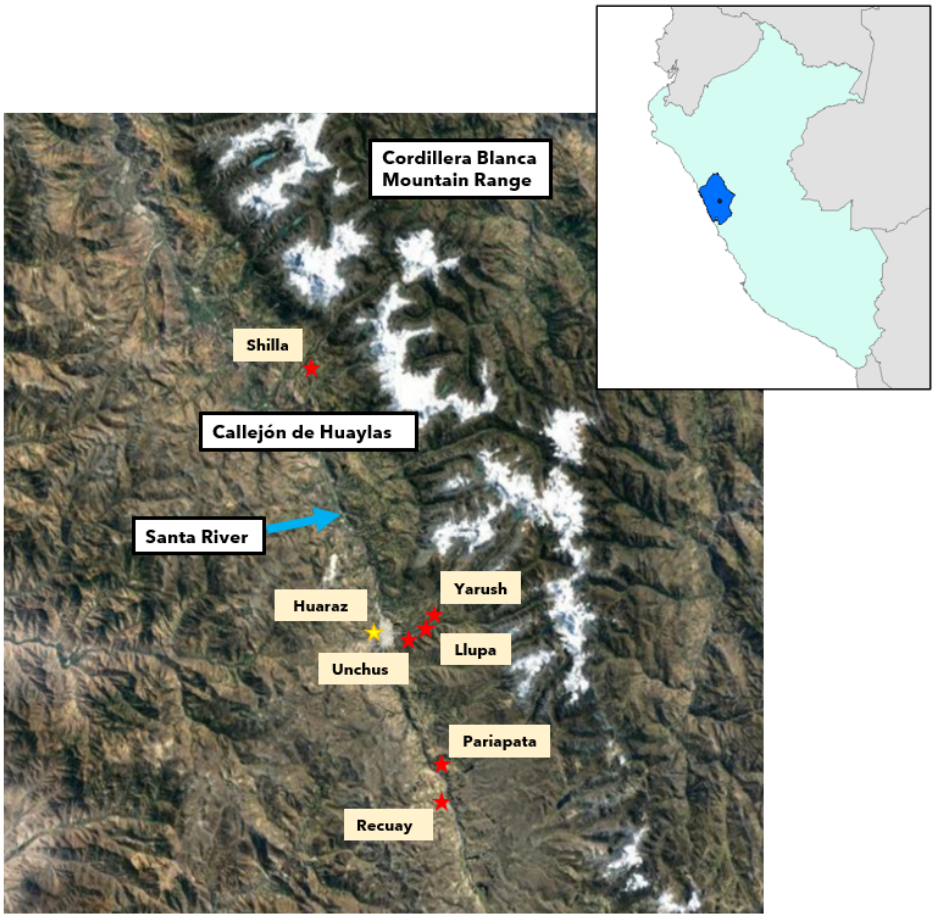

Figure 15: Map of study sites and key regional features. Inset map shows Ancash province. Image Source: Google Maps

4. Methods

This research draws on 21 semi-structured interviews with Quechua women in six towns in the Cordillera Blanca (see Figure 2) from July to December 2021. The purpose of the interviews was to understand Quechua women's lived experiences in a climate-vulnerable, deglaciating region of the Andes, thereby shedding a light on often-ignored voices that continue to be structurally marginalized. All interviews were carried out in the participant's location of choice, with health and safety factored in given the ongoing COVID pandemic and Peru's high rates of infection. For example, Inés brought masks and sanitizer to all participants to ensure safety. Inés chose participants through her relationships in the selected communities, which she cultivated through both personal and professional connections in her work on flooding, climate justice, and local outreach. Most of the women interviewed chose to meet at their homes, where Inés could easily walk through or take pictures of their home gardens and the land their houses were located on, which are major focal point of this study. We gave all participants the choice between conducting the interview in Spanish or in Quechua, with most choosing Quechua (15 Quechua, six Spanish). Inés transcribed and translated all of the interviews that she conducted in Quechua into Spanish, and Holly transcribed all interviews conducted in Spanish.

In interviews we worked from the overarching question: What are the everyday experiences of Quechua women living in regions that climate researchers have labeled disaster zones? We then collaboratively developed a set of interview questions that would address this broad research question (see Appendix B for sample interview questions).

Interviews for this study pivot away from vulnerability and leverage the strategy of "not talking about climate" (Marino in Crate & Nuttall, 2016) in order to more accurately and respectfully address the experiences of women in the region. This was important because our research question asks about women's lived experiences first and foremost, so we avoid research and interviews focused on climate change over peoples' lives.

Overarching Research Question *What are the everyday experiences of Quechua women living in regions that have been labeled disaster zones?*						
Participants: 22 women, ages 28-76						
Sub-Categories of Questions						
Life history	Land and titling	Imagination, creativity & desire	Livelihoods and economy	*Huertas* and *chakras*	Health and COVID	Perceptions of adaptation options

Figure 16: Interview Details

In addition to interviews, we also draw on archival research conducted in Lima at the Flora Tristan feminist library[3] by the first author, as well as on field notes written by the first author while in Peru in 2017, 2019, 2019, and 2022. Holly gathered articles from the feminist *campesina* journal Chacarera from 1989-2003 to understand challenges and testimony about *campesina* women's labor in periods of national crisis and the context of Indigenous feminist and rural women's movements that grapple with both the state and with the local effects of environmental challenges in rural communities. The journal was founded on the premise that "all over the world, women have a close relationship with the

[3] The Biblioteca Flora Tristan (Flora Tristan Library) is part of the Centro de la Mujer Peruana Flora Tristan in Lima, a feminist NGO created in 1979. The library specializes in gender, women, and feminism and was founded in 1983 with the mission to "spread the copious available information produced by and about women, and to support the labor that the NGO produces to change the relations between men and women in Peruvian Society."

earth; they are the ones who work on the farms, the ones that produce from the earth. Chacarera is an homage, a re-valuation, of all of the women who accomplish this grand effort" (Chacarera, 1989: p 1). Holly gathered pamphlets and other information about recent 'women and climate change' events that the Flora Tristan center had recently organized. These documents show how the national feminist discourse had changed over time, and how it addressed *campesina* women in highland communities.

This collaborative ethnographic work reflects both necessary changes to research methods in a time of multiple crises (political upheaval at the national level in Peru, the devastation of COVID 19) and the authors' commitment to generating collaborative research. As a white researcher from North America, Holly is sensitive to the fact that her understanding of the lived experiences of the women interviewed for this study are partial. Inés, as a woman from the town of Recuay in the Cordillera Blanca, was able to correct misunderstandings and mischaracterizations, and was able to build trust with participants, writing culturally appropriate interview questions, and navigating the difficulties of COVID 19 and interviewing in-person with understanding, safety, care, and expertise. Since this was a collaborative project, with one author based in Peru and the other in the United States, we spoke every two to four weeks on the phone to address adjustments that were needed in the interview process and to provide crucial geographical context.

Holly conducted the first round of coding based on the five categories of questions that were included in the interview itself (see Figure 16). After this broad coding, this particular section of each interview was extracted and the first author read

through each set of responses and performed a grounded coding analysis, looking for additional themes that were present within each category. These analytical themes were then sorted and codes were created from these sorted sets, which were then applied to the specific section of each interview that they pertain to. Holly analyzed archival information based on themes of gender, land ownership, and environmental change. Selected articles from *Chacarera* were read systematically for themes of agriculture, *huertas*, land and titling, and women's labor during moments of crisis.

6. *Planting as though the word were not ending: Quechua women's lived experiences of adaptation*

6.1 Gendered dimensions of adaptation labor – from *chakras* to *huertas*

Agriculture in the region typically occurs in two spaces: *Huertas*, which are smaller gardens grown close to the home at lower elevations near sources of irrigation, and *chakras* which are larger plots of land that are traditionally cultivated at higher elevations, typically above 4,000 meters in this region. *Chakras* contain produce staple crops like potatoes or wheat rather

Figure 17: A network of chakras at 4,500 meters in the Shallap sector, following the road from Llupa and Unchus

than the vegetables or fruit that are more often grown in *huertas*. Since *chakras* are located further from irrigation canals or domestic water supplies to bolster irrigation, they often rely on rain-fed irrigation, which means that only hardy crops can grow in them. Importantly, *chakras* typically involve a quite different gendered division of labor than *huertas*, with men and women both working to plant, monitor, and harvest crops (Deere, 1985; Deere & Leon, 2003).

Gardens are gendered spaces in the Cordillera Blanca, sites where women primarily tend to crops like vegetables, flowers, herbs, and fruit that can be harvested for sale or subsistence depending on household, regional, and national economic conditions. Women cultivate specific crops depending on what is growing well at the time, what is selling well in the market, and what is considered surplus after household consumption. For example, Ernestina mentioned that she sells bundles of herbs at the market every 15 days nearly year-round. She says that people come from Lima to buy the herbs, but it would be better if they could process them themselves and market them as local, organic tea.

Women tend to spend more time cultivating and managing *huertas*, which are smaller and closer to home than *chakras*, which may be located on distant parcels at higher altitudes. However, women are also involved in dual agricultural labor as *chakras* have increasingly more unpredictable crop yields, whereas they had traditionally been stable sources of staple household food supplies like potatoes and wheat. A woman named Rosa mentioned that "Women dedicate ourselves to agriculture, we dedicate ourselves to the business of herbs, we bring the herbs to sell then we buy our vegetables.

The men work in the *chakra*, together with the women, we support the men, harvesting potatoes and other things." The women who we interviewed highlighted the seasonal work that is necessary to sow and harvest potatoes in the *chakra*, and the near continuous work needed to plant, tend, and water vegetables and herbs in the *huerta* (see Figure 18).

Llupa/ Unchus	Yarush	Pariapata/ Recuay	Shilla
Mint	Chamomile	Onion	Lettuce
Anise	Eucalyptus	Cabbage	Onion
Borage	Onion	Chamomile	Garlic
Eucalyptus	Oregano	Anise	Zapallo squash
Garlic	Anise	Hierbabuena	Mint
Squash	White oregano	Squash	Pepper
Muna	Chamomile	Muna	Verbena
Malva	Hierbabuena	Verbena	Lucuma
Mustard	Parsley	Garlic	Lemon
Hierbabuena negra	Rue	Beets	Tomatillos
Lemon balm	Mint	Carrots	Muna
Chamomile	Corn	Eucalyptus	Beets
Cabbage	Cilantro	Peas	Cabbage
Celery			Chard
Pepper			Carrots
			Corn
			Peas
			Flowers
			Broccoli
			Eucalyptus

Figure 18: A non-exhaustive list of produce grown in women's gardens, by location

Figure 19: Huertas have different compositions depending on the area of the valley they are located in. Left: cabbage in Llupa, Right: mangos in Recuay. Photo credit I. Yanac León

Almost all of the women emphasized that *huertas* are more adaptable than *chakras,* because crops can be switched out quickly, irrigation is more readily accessible than at higher elevations due to proximity to canals, and there is not as much transportation time between the household and the field. Juliana explained that "Lower sections are more profitable, because in the higher altitude zones you can only grow potatoes or wheat, and you cannot irrigate." However, some women expressed realistic limits to the adaptability of *huertas*. Lidia mentioned, "When I arrived here they told me I should plant herbs, I was scared, because in my village we didn't do this. Before in order to sell you just went and gathered it, but little by little I have learned to sell. Before herbs grew in abundance, you could harvest and gather them quickly, this must have been in 2002 in the time when my oldest son was born, there were herbs in abundance." The lack of abundance was attributed both to a changing climate, including heat and hail, as well as novel pests that killed crops quickly if insecticides were not used and the need to use chemical fertilizer on depleted soils. This confluence of climate change and new reliance on chemical fertilizers means that women are increasing the amount of time that they spend in their *huertas*, as well as planning for the additional and sometimes untenable cost of fertilizers, while still working to try to adapt the chakras alongside the men in their families. Moreover, women are walking further for medicinal herbs such as *muña* that used to grow in abundance along riverbeds.

Changes to water have created additional labor for women, who are primarily responsible for managing near household drinking water and irrigation. The proximity of *huertas* to irrigation canals called *acequias* makes them more adaptable to climate change

than *chakras*, because they are not solely dependent on rainfall. Norma explained that, "Yes, we irrigate the *huerta* continuously. In contrast, other *chakras* are only irrigated when it's time to plant crops. We can adapt our *huerta* to our needs, like the vegetable." However, two women contested this testimony of adaptability that we heard from others. Lidia said, "Because of the changes in the environment the water dries up because it doesn't rain. This affects our *huerta*s and the *chakras* at the high elevations do not receive irrigation water, the rain is not like it was before" and "It's not adaptable in reality because when we plant something it doesn't produce the same way. Before with irrigation our *huerta*s were beautiful, it's not the same now." Moreover, many women said that houses that were higher in altitude received more water because they were able to water before the municipality shut off the water supply for the day or the week.

This leads to a reliance on women's labor as local governments fail to provide goods like irrigation solutions that respond to women's specific needs, such as access to regular water for *huertas*, since near-household irrigation falls disproportionately on women. Guillerma explained:

> "They were going to bring the water from higher up, this water is for my animals to drink. Just now you must have passed by the water where it is coming out by the school, the water comes out right there through the subsurface, but in the dry season there is not a lot of water. When I came from my daughter in law's house, this time there was a lot of water, but the people living higher up siphon it to irrigate, because of this in this area not a lot of water arrives. There is also a lot of

alder and other plants that suck up the water. Because of this they said that they were going to make a reservoir with the municipality's budget, but they still have not done anything."

Cows and herbs provide sources of income for women and families and are also deeply embedded in the identity of women in the region. They often have strong relational bonds with their animals as the primary herders, and hold a deep intergenerational knowledge of where to gather herbs and what to use them for. Now, more work and time and required to continue these practices as a result of climate change. Many women who tend cattle and sheep told us that they need to walk increasingly further and into higher elevations to find pasture for their animals, which reduced the scope of other activities they could complete in a day. One woman was often walks from Llupa to the city of Huaraz, then back up to Llupa, then into the mountains, then back to Llupa. It is not uncommon to pass multiple skinny, dead cows in the fields late in the dry season, as there simply is not enough pasture year-round to adequately feed them (Fieldnotes, September 1 2019). Medicinal herbs used to appear in abundance on the sides of riverbanks and near springs, so they were easy to gather. Now, gathering the same herbs for sale in the market takes all day, many women said. Again, these testimonies point not just to an increase in the total amount of labor and time that it takes, but also to the fact that this labor sometimes occurs with limited output to show for it. Some women spend all year herding their cows and helping them find springs and

pasture. Then increasingly more frequent severe droughts, which occur as a result of climate change, kill them before they can be sold the following year.

Nearly every woman interviewed said that they learned to cultivate their *huerta* from a mother or grandparent. These women have retained their mothers' practices of using *muña* for stomach aches, for example, and lemon balm for heart issues. Francisca said, "I learned by myself. My mom did it like this, when my father went to the coast, my mom planted. It's the same with me, when my husband works, I do the same. I carry forward the teachings and habits of my mother." This intergenerational knowledge, often shared amongst women, is highly valued.

The gendered discourse of service or social reproduction means that there is an assumption that work in the *huerta* should be done voluntarily without external support. However, women are seeing structural issues play out in their gardens that are no fault of their own, such as the changing politics of access to scarce water resources, increasing fertilizer prices and the need for chemical insecticide and fertilizer application that comes along with novel pests and climate change, and increasing food prices and reduced wage labor opportunities. This means that the *huerta* is both the site of food security for the family and an important source of income during interlocking crisis events, when jobs in tourism dry up. However, *huertas* and women who work in them are rarely visible, given the small scale of this kind of agricultural activity.

We were surprised to see that there was not a fundamental issue with a lack of titling for women's land. Many families had both men and women, husbands and wives, on the titles, which does not happen in all regions of Peru. Most participants said that it is

perfectly possible for men and women to both have titles to the land they own, and largely reflected the fact that both names should be on the title in the case of marriage. However, when pressed, women mentioned that they had not necessarily completed the titling process or registered their title in public registries or with notaries, leaving them in a possibly precarious position in the case of changes to land claims or family dynamics. Sometimes this was due to confusion about the process, or the presumption that it would be expensive, but it was also due to illiteracy and a lack of understanding of at what point in the titling process the land was considered truly theirs.

This issue is reflected in agricultural censuses like CENAGRO 2012, which notes that 50% of women nationally do not have a title or have not begun the titling process, 12% have unregistered titles, 9 % are in the middle of the titling process, and only 29% have titles that are formally registered (*IV Censo Nacional Agropecuario*, 2012.; *Gobernanza de la Tierra*, n.d.).Marcela, in explaining her precarious land situation where she cannot cultivate a *huerta,* said "In our case, my father made a mistake, and I inherited the higher elevation zone of the canal where you can't irrigate because the water doesn't reach. And my sister inherited that lower part where you can irrigate. It wasn't fair and sometimes I think negative things, I have also reconsidered why I didn't study, perhaps if I had studied I would have realized this inequality." Here, Marcela laments not having understood the titling process in order to advocate for herself within her family, which she attributes to her lack of formal education. Marcela's experience contrasts with the experience of Ernestina, who has had relatively easy access to sufficient land through her family's property. This shows how interfamilial specificities like birth order,

intergenerational conflicts, age, and access to more advanced education (i.e. beyond middle school) can influence access to land and therefore space to cultivate a *huerta*.

Significantly, *huertas* are key for survival in the Cordillera Blanca according to many of the women we interviewed. For instance, Lidia said, "I think, in the event that I didn't have my *huerta*, how would it be? Surely I wouldn't have enough of the basic food necessities to survive." Guillerma further specified, "Crops are important because without these we would not be doing well, because just purchasing would not be good, you would only buy a few things that you are missing like oil, rice. On the other hand you can easily eat the food from your *huerta* or *chakra* and store it for the year. You cannot live just buying from Huaraz." Therefore, the burden of labor that falls on Quechua women to continuously cultivate *huertas* has material consequences for the well-being of families and communities. Huertas should therefore be treated as sustainable and flexible sources of adaptation, and the monetary and labor burden should therefore be more readily supported by the state and other organizations who support adaptation planning.

6.2 *Huertas* highlight climate emotions and responsibility

Huertas and *chakras* constitute different emotional spaces. The *chakra* often holds past memories for women who worked there often as children. The *huerta* is more entrepreneurial and adaptable. "It's not stressful for me, being in my *huerta* passes the time, I don't feel tired, because the work is minor. In contrast when I work in the chakra yes, it's *tiring*" Lidia said. The *huerta* is also a space for imagination and joy. Gardens are spaces of joy, not just places that provide food and medicine. Women identify

economic limitations but emphasize that *huertas* open up economic and non-economic opportunities to sustain life. Despite these opportunities, it is critical to also discuss the emotional toll of adaptation and resistance to the prosaic way that outsiders view community-based adaptation—as a normatively good, sustainable, equitable, and traditional endeavor. Avoiding these superficial narratives of rural lives, labor, and social relations is key, and we should instead be grappling with the grief and worry that comes with laboring towards an uncertain future.

The lack of political will and follow-through related to addressing issues with water allocation and building irrigation canals leads to both stress and an additional burden for women, who often expressed anger at the lack of support. Guillerma says that in Llupa, they always say that there is going to be support for irrigation, but "later it seems like they forget. A long time ago they said they were going to improve the irrigation canal and build a reservoir because not a lot of water arrives in Llupa." We talked a bit more about all of the communities near Unchus and Llupa who still needed help with water because a sufficient supply does not always arrive through the irrigation canal because the irrigation canal gate gets shut off upstream in Yarush. This lack of responsibility on the part of the

Figure 20: Guillerma's garden, located far from an irrigation canal

municipal (and regional) government is leading to increased stress and labor for women, as they have to either travel further for water, wait for an irrigation day when water will reach downstream communities, or hope for rain, all the while watching their *huertas* dry out. This increases the marginalization of Quechua women, who are already the most historically marginalized people in the region, but also fails to support the vital adaptations that women are already making to challenging water conditions.

Surrounding every discussion of *huertas* in interviews was a mat of emotions. Sadness and worry were the most commonly expressed emotions and women almost always connected this to concern for the well-being of their families. Marcela said, "Now I feel sad looking at father sun, seeing the rainbow, when it covers the sun or at night when it covers the moon, seeing this I get sad, I think perhaps it's going to fall. The day before yesterday there were three rainbows in a row, the came out of Awkis and Hualcan lakes, and seeing this I became sad, I thought how will I be in the future? How will my grandchildren deal with this? In this moment I began to cry." Marcela went on to explain what she meant about the rainbows, saying that:

> "Before it was not like this, now the rainbow tries to cover father sun and mother moon, which is sad. I say that perhaps judgement day will come, I think about this a lot, I don't think about discussing my property (land) now. When I ask my children what they will do with the house, they tell me we will die right here, at least we have an adobe house to shelter us from the cold, because the houses of noble material (sheetrock) are cold." (Marcela)

This sense of grief, speculation, and responsibility for future generations amidst uncertainty clearly weighed on Marcela, as evident in her story about the rainbow covering the sun and the coming of Judgement Day. These difficult emotions did not dominate the interviews, but women often expressed their worries candidly and connected them to the future of their families and agriculture. Other women like Lidia mirrored these emotions with different anecdotes, saying:

> "I am worried, I think what times will my children be experiencing? It might have been better to not have children. Also the glaciers are melting, now it's different from when I was a girl, there is only ice on the highest peaks. What will life be like for my children if the glaciers are gone? What water will they drink? With what water will my children or perhaps my grandchildren plant? When one remembers the time of our grandparents you get sad, because the climate is not the same as it was before. When I was younger, the mountains were full of glaciers, everything was white. Now it's getting black, because of this I worry and I think: what will my granchildren's life be like when the glaciers are gone?"

Lidia's concern for future generations affects every decision she makes. She told us that she is steadily planning to buy more land because she cannot bear the thought of leaving her family without a place to plant. She is already mentally adapting to a future

where agriculture as usual will not be possible, showing a tension that was inherent in many interviews between periods of worry and times of optimistic planning.

The challenges of daily life, some of which are gender-specific, also interact with environmental change to produce narratives of hard labor and suffering. For example, Margarita mentioned that she needed to increase her agricultural work as a result of her father's alcoholism, which caused her to suffer. She said:

> "My father was useless and did not plant, he just drank his alcohol. He left the house with his *colegiala* (alcohol and water) heading to the chakra, after we would find him sprawled out in the chakra snoring, because of this he didn't plant. So when I was 12 or 13 I started to gather herbs, near the glacier. I brought *Huaman ripa, raiz valeriana, cola de caballo*, we brought these herbs down in the snow, crying and crying we dug them out with frozen hands, I suffered like this when I was little."

This story is not one of joy or carework. This pressure to provide for the family when a parent is unable to work led to great difficulty for Margarita, so much so that she urged all of her children to attend school so they did not suffer gathering herbs like she did.

Historically in moments of interlocking crises that affect livelihoods in Peru, *campesina* women have shouldered much of the near-household labor, often because men migrate or households are squeezed for resources and money in new ways. Our research

shows that this extends to the present day with the challenges of climate change. Women struggle to imagine that things will improve without support for adaptation in particular, especially since they continue to experience marginalization and violence from the state and society at large (Bant & Girard, 2008; Oliart, 2008; Radcliffe, 2002). This testimony is honest and critical. Although it could be wrongly misconstrued as vulnerability, women's experiences show that continued marginalization is structural and desired support for their current adaptations is almost entirely absent. It does not mean that women are inherently vulnerable or passive victims.

Scholars have noted that the emotional pressure to provide a safe home under conditions of economic, social, and environmental precarity falls more squarely on the shoulders of women than on men in the Andes (Babb, 2020; Wilhoit, 2017). Women echoed this in their responses to the question "what do you think of when you think about your future?", almost always referring to a desire to provide agriculturally viable land, housing, and education to their children in order to shore up their security. This type of emotional labor was also common during the crisis of the internal conflict in Peru, where gender-based violence and displacement disrupted women's emotional lives in particular, yet they were still expected to perform both emotional and material labor in order to maintain homes and communities (Bueno-Hansen, 2015; Theidon, 2013).

Despite the difficulties that women expressed, *huertas* were one of the spaces where women consistently noted experiences of autonomy, agency, and joy. Indeed, women's participation in home gardens has been shown to have positive implications for social, mental, physical, and also environmental well-being (Braga Bizarria et al., 2022).

Women who we interviewed for this study expressed the same sense of well-being, and how it helped to ameliorate the stress of adapting to the increased economic pressures of high food prices, changing environmental conditions, and lack of support from local and national governments alike. Santa said, "For me sowing the garden is fun, I feel content and I feel care towards my plants, I don't have worries, my worries leave me when I am in my garden." Hillmi expressed a similar sentiment, saying that:

> "While I am still healthy, I will still be here in the *chakra*. Always, even as a child, my parents had me in the *chakra*, cultivating potatoes a kilo at a time. Like they say, from the *chakra* to the *olla* (cooking pot), calmer, to be looking around, how beautiful, how delicious. And while I have my health, I want to be here in the *chakra*. Now I have my chickens, roosters, bulls, pigs, and with this it's easy and I can irrigate. Up until I can't. And then when I can't, my children can take over and I can sit still."

The happiness available to the women as they cultivate land is therefore a product of different life experiences and identities that afford each person unique opportunities to take a step back and experience joy. Crucially, this happiness and joy does not undermine real experiences of worry and hardship, nor do hard times and difficult emotions connote vulnerability. Instead, these testimonies give a better sense of women's priorities and how they process shifting social and environmental conditions in their *huertas* and beyond.

6.3 Interlocking injustices and resisting romanticized adaptation labor

In times of crisis, work falls on women and *huerta*s become more important than larger *chakras*. Although the interviews that we conducted are not explicitly about COVID, the fact that they were conducted in this time period allowed us to see a broader trend of increasing women's labor during times of interlocking crises, which we define as national or even global level issues that have compounding effects with environmental change at the local level. For example, almost every woman Inés interviewed discussed the effects of increasing fertilizer prices on the *huertas*. They were not able to afford fertilizer if they needed it because global gas prices and transportation strikes, along with Peru's increasing investment in agricultural monopolies, had made fertilizer unaffordable. Additionally, women said that they were unable to sell their herbs during COVID because they were barred from descending to the town of Huaraz, for example, where the largest market in the valley is located.

The *huerta* is a space that reflects these crises both presently and historically. The first issue of Chacarera notes that the founding body, the National Network of Rural Women (RMNR) is dedicated to bringing together national issues that affect *campesina* women to reduce disinformation and prevent feelings of isolation. The first issue notes that "we know that our bulletin is born in extremely difficult moments and that as women we will be the most affected by the consequences of the crisis and the violence" (Chacarera, 1989: p1). Below is a chart that shows life under the crisis of Peru's civil war (see Figure 20), which looks very similar to the reflections of women in the Cordillera Blanca about the combined health, environmental, and social crises they are

experiencing, and how they affect the lives of women in particular (see adapted Figure 21 based on this research):

Effects of the crisis at the department level:

- Lack of capacity and impoverishment of agriculture
- Reduced production and productivity
- Deterioration of exchanges between the countryside and the city
- Contraction of campesino consumption and reduction of market relationships
- Acceleration of migratory fluxes
- Deterioration of health conditions, food, and education

*To this crisis, one has to add the climate risk, because there is not a year when part of the crops is not lost because of drought or excess water, hail or frost.

Figure 21: Translated figure from Chacarera, Vol 3, 1990: p. 14

Effects of interlocking crises at the local level in our study sites (based on interviews):

- Lack of capacity and impoverishment of agriculture as a result of reliance on chemical fertilizer and insecticides
- Reduced production and productivity as crops fail due to climate-change related pests, heat, frost, hail, and lack of rain
- Deterioration of exchanges between the countryside and the city as a result of COVID and increasing poverty following the pandemic
- Contraction of campesino consumption and reduction of market relationships as a result of decreased purchasing power and the high price of consumer goods
- Acceleration of migratory fluxes as men take jobs in tourism and mining and young people move out of rural areas
- Deterioration of health conditions, food, and education as a result of agricultural monopolies, deteriorating water quality, provider-stress, and COVID

Figure 22: Adapted and updated figure from Chacarera, Vol 3, 1990: p. 14 that reflects the current effects of crises at the regional level in the Cordillera Blanca, Peru

Women are not able to infinitely adapt under conditions of accelerating climate change using ingenuity and traditional knowledge alone. Interlocking forces such as the market, environmental change, and politics create a lot of worry, a word that women used

often. Margarita described a harrowing view of the future, noting "I see bad times, I see that we will arrive at worse times, I think God will send death, the bridges will fall, and the waters will dry up. When it hails the Auqui river drowns sheep, it wasn't like this before, now it rains like crazy in some areas. In some parts as soon as you hear "*qash*" it falls like I don't know what, and our plants won't grow. Also fertilizer, I don't know how much it costs, 200 soles? How are we going to be able to buy this? We won't be able to plant, how will we live, I say?"

In times of interlocking crises, the *huerta* has served as a food security backstop, a pharmacy, a space to cultivate healthy food, and a more joyous form of labor than the physically demanding work in the *chakra*. Since women are in charge of the health of the family, and conserve traditional knowledge of medicinal plants, they have often been in charge of "botiquines familiares" during times of crisis and when medicine is not readily available (Chacarera_1990_3) which for example happened both during the internal conflict of the 1980s and 1990s and during COVID lockdown. However, climate change is affecting women's ability to maintain these *botiquines familiares*, amidst a deep skepticism about Western medicine and pills that many older women still have.

In the interviews we conducted, women were processing experiences of environmental and social change by describing new and varied social positions. The new subjectivity most obviously on display from interviews was the desire to support younger generations in moving away from the suffering of agriculture-constrained life on the *chakra*. For example, Hillmi says that, "I don't want you to be like me, in the *chakra* turning over the earth, that they yell at you and dishonor you and tell you many things. I

can take it all, but you all have to be something else. Study study study so you aren't like me, for yourselves and not for me." In this way, women are hospicing at old way of life—that of the agricultural laborer spending long hours on the *chakra*— and working to produce a new one through their children. But they do not view their children the same way, since they have a chance to escape the suffering their parents endured.

Women's insistence that children focus on studying to avoid the suffering of agricultural labor was repeated again and again during our interviews. This underscores the need to question romantic notions of returning to traditional farming practices, which women say were never activities that were inherently easy. Sonia says, "I tell [my children] to study and to not be ignorant like me. My mother sent me to study but I did not want to. Because of this sometimes I am regretful, and because of this I tell my children that they should study so that they do not end up in the chakra, because it's difficult. With their knowledge they could go anywhere." Indeed, women we interviewed who are over 40 tended to be more focused on educating their children and allowing them to escape the difficult rural agricultural life. They are the ones who most frequently spoke about needing to adapt to current conditions to cultivate their *huertas* and support their families.

Women are operating in an atmosphere of shrinking social services, all while they are trying to adapt to climate change. Chacarera explains, "The important economic participation of *campesina* women in agricultural production and peasant reproduction has been permanently ignored in the design and application of macroeconomic and sectorial policies. The reason that this omission remains is explained by the fact that the

work of the *mujer campesina,* as much production as reproduction, has been conceived of in theory and in practice as an obligation of the woman that lacks economic value" (Chacarera, 1995, Vol 16, p 46). Additionally, recent decisions by the Peruvian government to prioritize agribusiness over family farms has exacerbated the unequal position of *campesina* women in agriculture (Dudenhoefer, 2018) and the lack of remuneration for this adaptation labor. Many of the current programs or projects that incorporate women do not solve any of these problems, they just legitimate the traditional role of women as careworkers who make up for the lack of state services instead of active agents in politics, economies, and climate change adaptation. Indeed, nationally-based social service programs like Juntos, Vaso de Leche, and Club de Madres—which traditionally provide food and agricultural assistance to women, children, and families—used to be more widely known and participated in than they are now.

7. Policy and planning recommendations

*Huerta*s are shaped through a range of pressures that are both local and global, climatic and social, and all of this is ultimately affected by race and gender. Quechua women are therefore continuing to pilot creative solutions, knowledge, and leadership to allow communities to adapt to climate change and other social shifts, but are still systematically under-supported and devalued despite the decades long focus on sustainable development and gender mainstreaming in adaptation and development (Alston, 2014), and the history of *huertas* being crucial during moments of crisis, of

which there is testimony in the archives throughout the Andes, not just in Ancash and Huaraz.

Women are performing unsupported labor for the nation and are being held up as especially resilient and valuable while continuing to be marginalized and even experiencing violence. 80% of the country's food production comes from family agriculture and underscoring that the woman is at the head of family agriculture (Torres, 2022). The announcement of a second agrarian reform in Peru, which was scuttled after the ouster of President Pedro Castillo in 2022, would have centered rural women (Andina, 2021; Torres, 2022). Optimistically, this would have funneled both support and attention to Indigenous and *campesina* women's labor that is sorely needed, and could have led to more funding, support, and research on women's role in supporting food security, sovereignty, and climate change adaptation.

Indeed, adaptation options are always enmeshed with both local and national political economy, and interviews with women in the Cordillera Blanca show that ever-increasing labor and limited time are leading to both negative health effects and a deep pessimism about the future and the sustainability of life itself in the region. But they say that this could be counteracted if local authorities in particular would listen to their demands, especially around irrigation water for *huertas*. In the process of laboring to make the future happen, in a largely unsupported way, women are experiencing emotions that inform their perception of adaptation options for their families and communities. This intimate, private, personal, emotion-laden, grounded, and culturally relevant information that women shared with us is invaluable testimony about the challenges

women experience in managing interlocking crises that affect adaptation options in the Cordillera Blanca.

A more transformative view of local adaptation would include gender, labor, emotions, and health in its funding and planning scheme, all of which would be informed by ethical research conducted in collaboration with local women. Policy-wise, this increasingly gendered aspect of adaptation-related work represents an opportunity to address and enact transformative changes to the politics of gender, water, land, and adaptation in the Andes and beyond. Ultimately transformative climate justice must be grounded in the politics of place, which are experienced in distinct ways based on different nodes of identity such as gender, race, and class (Amorim-Maia et al., 2022; Nightingale et al., 2022). States and organizations responsible for adaptation planning, funding, and research need to be attentive to the historical continuity of responsibility and not overburden or overshadow those who already experience this persistently, like Quechua women in the Cordillera Blanca.

The gendered discourse of service and carework has led to a reliance of labor at the household level, a phenomenon that has been documented globally as men migrate in search of work and women and other gender minorities are left to shoulder local adaptation (Birkenholtz, 2023). This labor has real emotional and health effects that produce compounding barriers to adaptation, as well as a real sense of hopelessness. If women in local communities are constantly overlooked, and interlocking crises affect the very fabric of their lives, we should not expect women to be resilient in spite of it all,

contrary to many adaptation narratives about Indigenous women (Enarson, 2012; Jordan, 2019).

The experiences that Quechua *campesina* women are having on the ground in the Cordillera Blanca are reflected in trenchant national struggles over Peru's changing agricultural economy. This reflects the connection between Indigenous women as stewards of agriculture, a point of national pride for Peru, but does little to address the history of regionalization, movement towards big agriculture, lack of funding, and lack of resources that hamstring women in the Cordillera Blanca and elsewhere in their agricultural activities. This research shows that projects that hope to support women's role in local agriculture within the context of adaptation should start by asking women what their needs are in a way that addresses the contextual fabric of their lives, rather than asking questions that are only related to climate change.

Importantly, agency and despair exist in tandem for Quechua women living in highland communities in the Cordillera Blanca. This also points to the prevalence of emotions in the interviews and the need to avoid researcher bias towards looking for normatively good, positive, generative, and future-oriented activities that were led by Quechua women at the local level. Sometimes the situation was simply challenging and it's important to recognize this and hold this tension with the ability of women to both grieve and lament present circumstances, but also circumvent the narrative of hapless victims of social and climatic change.

*Huerta*s are also a translation tool to show how Indigenous and *campesina* women's labor is exploited and undervalued, but also how transformative adaptation

politics could be enacted through a sharper focus on the gendered dynamics of adaptation and how they remain consistent across time. *Huerta*s have also provided an important focus for Indigenous women's organizations to center Indigenous women's politics of food and territorial sovereignty at the national level in Peru (TVPerú Noticias, 2022). These provide tangible spaces to talk about controversial or intangible values, like relationships with the other than human, intergenerational knowledge, and emotions and climate grief through the lens of something concrete and real.

It is important for development and state actors to recognize that autonomous, community-based adaptation is not novel. In fact, it stems from a long history of social, cultural, and technological changes and innovations that are developed by communities themselves (Pisor et al., 2022). However, this does not mean that communities are not in need of support. The pace of interlocking climate, social, and political changes—which is exacerbated by ongoing colonialism and economic activities that displace Indigenous communities and therefore interrupt knowledge transmission about specific places and environments—can undermine a community's real or perceived ability to adapt. Instead of installing top-down adaptation efforts, vulnerable populations within minoritized communities, like Quechua women in the Andes, should have choice over their adaptation options, choices that are clearly present in our interviews, but which are not funded and supported

8. Conclusion

This article shows how gardens are sociopolitical spaces that rework understandings of climate change adaptation in mountain environments through women's labor and care. *Huertas* are sociopolitical spaces that unveil the social dimensions of adaptation outside of hazards and risk, shine a spotlight on Indigenous women's labor, and reflect broader structural injustices that play out in climate change and social policy negotiations at the national level. They are also important for women's agency and well-being. Women theorize their daily lives under conditions of climate change through their everyday experiences, which they communicated through stories that emerged in interviews conducted in women's own homes and gardens. These theories challenge existing ideas of adaptation in the Andes by situating household spaces and gendered forms of labor squarely within the politics of adaptation in a region preoccupied with international research on melting glaciers and changing mountain environments. In other words, women's Huertas present a completely different view of adaptation that is missed when the sole focus is on water, glaciers, and infrastructure.

This article contributes to the climate change adaptation literature and the adaptation literature by unveiling the stakes of gendered labor in marginalized communities within the context of the *huerta*, a small scale and often overlooked place. Indeed, the legacy of women's labor, particularly in *huertas,* during different crisis moments in Peru has not been visible in adaptation policy. Meaningfully including Quechua women's lived experiences of adaptation would benefit women and marginalized populations in Andean communities like those in the Cordillera Blanca,

where challenges with land and agriculture that are compounded with climate change, COVID, and changing agricultural regimes and food. The feminized labor involved in sustaining life, such as gardens, schooling, water, thinking about irrigation, and intergenerational welfare, is not compensated or even planned around. It is taken as a given and is having a clear effect on women's health and sense of well-being, as they describe. Therefore, top-down adaptation planning that focuses on technical processes must be de-centered and complemented with an even greater focus on women's adaptations, like those performed in *huertas* by Quechua women.

V. CONCLUSION

When I arrived in the Cordillera Blanca in the summer of 2017, I dropped my bags in my hotel room and headed to the center of the regional capital city of Huaraz. After the long bus ride through the Andes, I was desperate for a cup of coffee, and found California Café after some aimless and bleary-eyed wandering through the bustling streets. I sat at the bar because the shop was full of hikers with backpacks, tourists with Lonely Planet Peru books, and other exhausted travelers. As I talked to the people working at the café, someone sitting next to me overheard that I was a researcher and guessed that I was working on glacier melt and glacial lake outburst floods. When I nodded and turned to him to continue the conversation, he waved his hand dismissively and said, "this place is crawling with climate researchers." I would hear some version of this statement over and over again from local people: the Cordillera Blanca is "saturated, crawling, filled" with researchers. When I was with the international team of scientists that I was collaborating with, everyone seemed to know of us, and never asked any one of us what we were doing in the area.

However, it soon became clear that despite the over proliferation of climate research, there were groups of people whose experiences were never heard amongst the clamor to document glacier melt. Namely, the experiences of Quechua women living in highland communities, who many of these researchers told me were often unwilling to speak to foreigners at length. Once I started to conduct research with these women, I was constantly asked why I was here, what my interests in the area were, and increasingly

personal details about my life. This level of engagement felt qualitatively different than my previous work on glaciers, and the women who I would eventually collaborate with gave me a different perspective on research. The lives of the women in Llupa and Unchus in particular would become far more important than the glaciers they lived under.

This dissertation takes a feminist view of climate change adaptation amongst Quechua women in the Peruvian Cordillera Blanca in order to understand the lived experiences of historically marginalized communities in rapidly changing mountain environments. It also extends this analysis to the national level by examining the politics of gender and Indigeneity in national level climate change adaptation planning. I draw on semi-structured walking interviews, semi-structured life history interviews, collaborative fieldwork, document analysis, and archival research to understand Indigenous women's lived experiences of adaptation at the local level and how these experiences coalesce into demands of the government at the national level.

Summary of dissertation

In **Paper 1**, I use a case study in the Cordillera Blanca mountain range to advance a feminist, decolonial framework of everyday adaptation called 'futuremaking' that challenges the current ice-and-water-focused paradigm of adaptation policy in glaciated regions. Futuremaking is a feminist, decolonial process of everyday adaptation in a disaster zone that relies on A) Prioritizing the everyday over the someday; B) Intergenerational welfare and community networks of care, and; C) Dynamic and embodied adaptations to uncertainty. I draw on interviews with Quechua women,

participant observation on adaptation planning teams, and informal expert interviews to advance the futuremaking framework, which prioritizes the everyday and future desires of women and households over technical adaptations that view people as vulnerable. I argue that futuremaking both challenges the efficacy of adaptation projects currently underway in the Andes and charts a path towards more transformative adaptation interventions by prioritizing feminist networks of care over managing damage and disaster.

In **Paper 2**, I analyze the 2019-2021 process of creating Peru's national adaptation plan to understand how gender and Indigeneity are mobilized by different actors in climate change adaptation planning, and the broader work that these framings do for institutions, governments, and Indigenous women. I argue that Indigenous women leaders in Peru are drawing on their long history of territorial claims and landed expertise to re-make adaptation planning into a space that transforms the political aims of state-level adaptation policy by centering Indigenous sovereignty. In so doing, I make two contributions to the literature on transformative climate change adaptation: 1) I show that adaptation plans that foreground gender and minoritized populations cannot be considered transformative or equitable if they do not address land and sovereignty, and 2) I demonstrate that plans that rely solely on gender and multicultural mainstreaming are liable to produce maladaptive outcomes, since they continue to protect economic activities like mining that disproportionately affect Indigenous women's health and adaptive capacity. This research is key for a policy and planning audience that is aware of

the gendered and racialized politics of climate adaptation, but may overlook questions of territorial sovereignty and Indigenous women's embodied connections to land.

Paper 3 draws on in-depth interviews conducted with Quechua women in four sites in the Cordillera Blanca. It weaves together in-depth interviews with Quechua women across three regions of the Santa River Valley in the Cordillera Blanca— along with participant observation, archival research, and document analysis—to understand Quechua women's everyday experiences of adaptation, and how these experiences intersect with political-economic struggles around gender, land, water, and agriculture in a region experiencing climate-related glacier melt, flooding, and water scarcity. We argue that Quechua women's *huertas* are political spaces that are often overlooked but crucial for community livelihoods during moments of climate, political, or economic crises, and that this has been continuous throughout time. They are also important for women's agency and well-being. However, these small-scale adaptation options are not often funded or supported sustainably at the scale of larger adaptations like flood prevention measures, both because women's voices are ignored, but also because of the highly political and gendered issues of land use and water rights that *huertas* shine a spotlight on, as well as the assumption that near-household labor in service of adaptation should be done voluntarily and automatically without external support. This means that women's labor in supporting families and communities with local adaptations remains in the shadows, while at the same time this increasingly gendered aspect of this adaptation-related work represents an opportunity to address and enact transformative changes to the politics of gender, water, land, and adaptation in the Andes and beyond.

Policy implications

There are three main policy implications that arise from this dissertation. The first is that instead of simply thinking about including the voices of Indigenous women in adaptation planning, any effort to design adaptation programs should instead address how power interacts with gender to foreclose certain adaptation futures and support others. For example, viewing Indigenous women as either homogeneously vulnerable or resilient to climate change leads to policy solutions that ignore the *diverse* lived experiences of women. But it also means that those who design adaptation programs may feel entitled to step in and provide urgent, emergency support on behalf of seemingly vulnerable women who they see as incapable of adapting on their own. Conversely, narratives of resilience ignore the structural barriers that undermine adaptive capacity, such as the state's refusal to address territorial sovereignty as a precursor for Indigenous women's adaptation across the country.

The second policy suggestion is to rethink climate change adaptation and how we recognize efforts to adapt in climate hotspots, such as glaciated regions of the world. Instead of categorizing adaptation as solely infrastructural or engineering efforts that are meant to prevent disaster, adaptation professionals and governments should instead see adaptation as an everyday affair. Supporting adaptation at the infrastructural level often requires investments in materials and labor that are far from community-based. On the other hand, focusing on adaptation as a series of everyday *processes* and actions—such as tending to *huertas*, building hotels, selling herbs in the market, and herding animals—reveals an entirely different idea of adaptation. This forces the state and organizations

interested in adaptation planning to pay attention to things like women's labor in home gardens, the effects of age on adaptation prospects, the location of irrigation canals relative to *huertas*, soil quality, and the local political economy of agricultural markets. Additionally, it requires that adaptation planning address the structural barriers to achieving equity in these spaces.

Finally, any effort to mainstream gender and race or ethnicity into adaptation planning should also include land. For Indigenous women, removing discussions of territorial sovereignty from gender leads to a reductive, abstract, and ahistorical view of adaptation experiences, and how state-led adaptation processes can perpetuate ongoing violence despite seemingly progressive intentions. It also means that issues like mining and agribusiness can be protected in the process of adaptation planning since they are seen as separate from issues of gender and race, even if they are not seen as separate from climate.

Contributions to the literature

I put forward futuremaking as an alternative to the two common framings of community-based research on climate change: research that positions community-based adaptations as inherently positive without documenting the real challenges of daily life within environmental or social injustices, or doomsday research that only seeks to document damage and destruction at the local scale to account for loss and damage. Feminist frameworks combined with desire-based research provide an alternative by examining everyday experiences from the ground up (Bee et al., 2015; Iniesta-Arandia et

al., 2016; Ravera et al., 2016; Tuck, 2009). Futuremaking pulls in strands of this literature to represent the full range of moments that happen in the lives of Quechua women in the Andes, who are often reduced either to victims of climate change who must be saved or ignored in the quest to provide technical solutions to adaptation challenges. By refusing too-easy characterizations of Quechua women's lives, futuremaking not only allows for but shows the power inherent in emotions, disagreements, drama, and routines. It is at the scale of the household and daily life that the negotiation between social and environmental conditions unfolds in detail and reveals the priorities of Indigenous women in concrete rather than abstract ways. My work decenters climate change, considering it to be among a menu of different issues that affect women in the region. In the Cordillera Blanca, for example, vulnerability is fundamentally tied to socially produced inequalities that may have nothing to do with ice, such as land availability and access to social services.

My dissertation also pushes scholarship in the field of critical adaptation studies (Buechler et al., 2015; S. H. Eriksen et al., 2019; D. E. Johnson et al., 2021; Nightingale et al., 2022) to consider territorial sovereignty as a critical component of adaptation for Indigenous women and communities across the globe. I show that the focus on gender and Indigeneity in adaptation planning in Peru is held up as inclusive and transformative. Yet this symbolic representation actually distracts from Indigenous women's continuous claims that mining and other state-sanctioned incursions onto Indigenous lands are continuing without free, prior, and informed consent. Climate change adaptation cannot be justice-oriented if it continues to allow for mining, land theft, and extractive activities

that undermine territorial sovereignty and commit violence against Indigenous women and other minoritized communities. We must pay attention to Indigenous women's resistance to adaptation efforts since they are calling out power structures that transcend gender. Transformative adaptation must therefore center land, in addition to attending to gender and Indigeneity—and few studies include land, gender, and Indigeneity in their studies of adaptation equity. By thinking about the politics of land and ongoing issues of extraction in conjunction with feminist adaptations (Cusicanqui, 2010; Gonda, 2019; Leinius, 2021), it is possible to see the long history of resistance that Indigenous women have sustained and how this extends to climate change. This aligns with decolonial scholars of adaptation—thereby pulling together feminist, decolonial, and transformative adaptation research in new ways.

After writing against technical adaptations and climate centered work for years, I have only recently begun to think about the alternatives to these framings. I suggest that scholars pay attention to adaptation in provincial and gendered spaces (Bee et al., 2015; Elmhirst, 2015; Ensor et al., 2019; Funder et al., 2018) and who provides the labor that often supports these invisible adaptations (Birkenholtz, 2023; D. E. Johnson et al., 2021; Mills-Novoa, 2023). In the Cordillera Blanca and indeed throughout Peru, Indigenous women are laboring to process the uncertainty embedded in ecological and social change on behalf of entire communities, which affects the well-being of women in the region. The nascent literature on climate change adaptation labor is just beginning to consider unremunerated carework done by minoritized communities, and particularly Indigenous women in the Global South. This study shows that not only is this labor central to the

survival and thriving of entire communities, but it is also taken for granted as carework (L. Johnson et al., 2022) and therefore not often seen as adaptation labor at all—especially because it is not connected to formalized adaptation initiatives. Additionally, scholars of adaptation planning and adaptation labor should consider the effects of interlocking injustices on the carework that marginalized communities perform to support adaptation. This means that the long history of how Indigenous women have shouldered community well-being in times of social and ecological challenges should be incorporated into research on adaptation labor, rather than seeing climate change adaptation as an issue that presents novel demands on Indigenous women.

Future directions

Thirteen years ago, I attended a film festival in Ayacucho Peru that discussed the long history of violence against Quechua people in the Peruvian countryside. The afternoon before the festival, I visited a workshop outside of the city where women painted *retablos*—hand carved scenes that depicted aspects of life in the Andes. One of these *retablos* showed violent scenes of war, death, and grief next to scenes of women tending to small children bundled in cloth and baby sheep in the middle of green pastures. A friend who accompanied my on this trip posited that perhaps women I met in Ayacucho more than a decade ago showed us what futuremaking entailed, and that I just needed to make my way back to the women and *retablos* that planted this seed.

Figure 23: L) Retablos in a workshop in Ayacucho. Photo by H. Moulton (2010). R) A woman puts the finishing touches on a figurine for her retablo. Photo by H. Moulton (2010).

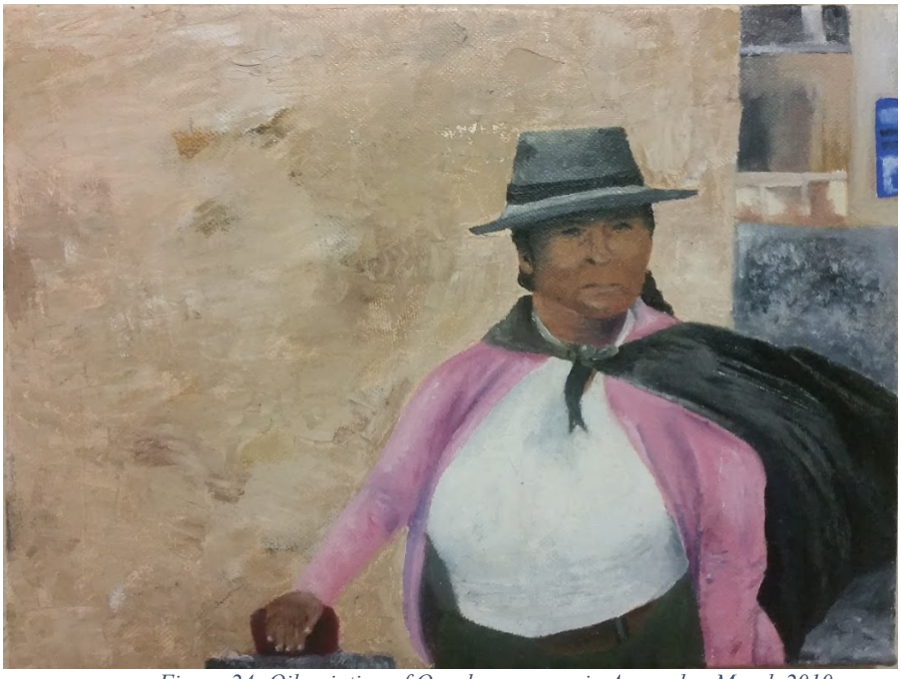

Figure 24: Oil painting of Quechua woman in Ayacucho, March 2010.
Painting and photo by H. Moulton.
(painted and photographed with permission).

In a sense, my fascination with glaciers and with mountains was also instrumental in bringing me back to this important work on women's adaptation. In the process of researching narratives of ice loss, riding in 4WD trucks with glaciologists, organizing workshops with well-known local authorities on ice loss, and taking streamflow measurements with hydrologists, I realized that I was not meant to tell the story of ice. This delicate process of decentering ice in research on climate change adaptation in the Andes has been an ongoing struggle—Lake Palcacocha seems to creep into every presentation I give. I recognize that completely decentering ice and climate change is both dangerous and undermines the cultural importance of glaciers, water, and environmental change to people in the region where I work. In the Cordillera Blanca mountains are still sacred *apus* for some people and the loss of glaciers indicates the coming Judgement Day. Eliminating glaciers, water, and climate change from ethnographic research would undermine these important beliefs. However, the near singular preoccupation with glaciers that I maintained for my master's and my doctorate also fails to adequately understand the challenges of Quechua women in particular under conditions of climate change. It is important to hold this tension.

My future work will build on the third article of my dissertation to reframe adaptation in glaciated mountain ranges as more than just ice loss and water scarcity. I plan to conduct follow-up interviews and focus groups to ask how the changing politics of material resources—such as agricultural prices, food quality, soil, fertilizer—intersect with shifting social resources such as *Juntos de Madres, Vaso de Leche*, and targeted adaptation programs—to affect women's *huertas* in the Andes and the climate change

adaptations they support. Moreover, I will work collaboratively with experts in GIS and remote sensing to map changes in women's Huertas over time in order to determine the time scale of shifts from chakras to Huertas and map this onto changes in water and shifting market condictions. I will also work collaboratively with local women, soil scientists, and hydrologists to understand how women's adaptations in *huertas* are changing the soil composition in a national agricultural environment that increasingly relies on chemical fertilizers due to depleted soils. Finally, there is limited research on the intersection between extraction, land, climate change, and Indigenous women's adaptations in Peru. I will conduct additional research on how resource conflicts across Peru—for example, mining concessions and land grabs for agribusiness—affect Indigenous women's adaptive capacity.

APPENDIX A

Interviews

Participant	Location	Date
Violeta	Unchus	8/15/19 & 10/5/20
Julia	Unchus	2/19/19 & 11/15/20
Yobana	Unchus	2/19/2021
Martina	Unchus	9/4/19 & 10/18/20
Maria	Huaraz/Llupa	10/9/20
Juana (conducted with Lidia)	Llupa	8/25/19
Lidia (conducted with Juana)	Llupa	8/25/19
Giovanna	Llupa	10/18/20

APPENDIX B

Interview Questions

Semi-Structured Life History Interviews[4]

1. What is your name?
2. What is your age?
3. Where do you currently live (town/village)?
4. Where did you grow up? Where is this in relation to where you live now?
5. What is your earliest memory? Who was with you? What was important to you?
6. Could you describe a typical day in your life? How and why has this changed over time?
7. Does your typical day differ between members of your household? Howso? Are there differences between men and women in terms of responsibilities?
8. Do you do creative projects during the day? Do you have time to relax or do things for yourself during the day? What, if anything?
9. What do you do for work?
10. Do you have children, family members, or friends who live with you/who you support?

[4] All interviews included the questions listed here, but included additional content and questions by virtue of their semi-structured design. Life history questions helped to elicit additional questions that were unique to each participant. Follow-up interviews included participant-specific questions.

11. Do you have access to enough resources to support your family? What are these resources?
12. Can you describe your house for me? Your farm/garden/pasture?
13. What is the nature/environment like near your house? What grows there, what is the water like, etc?
14. How has the environment at or around where you live changed over the course of your lifetime?
15. How do these changes affect you? Your family?
16. How have the mountains/glaciers around you changed? Does this affect you? What are the risks that you perceive?
17. What does the word vulnerability mean to you? Resilience?
18. Are you aware of any projects (government or otherwise) that support your daily needs/life?

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