Khana khanu bhayo (Have you eaten)? Traditional rice varieties, land tenure, and social structure in Nepal’s mid-hills

Marie Louise Ryan
Iowa State University

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Khana khanu bhayo (Have you eaten)?
Traditional rice varieties, land tenure, and social structure in Nepal’s mid-hills

by

Marie Louise Ryan

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degrees of

MASTER OF SCIENCE
MASTER OF COMMUNITY AND REGIONAL PLANNING

Co-Majors: Sustainable Agriculture; Community and Regional Planning

Program of Study Committee:
Francis Owusu, Major Professor
Carmen Bain
John Tyndall

The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this thesis. The Graduate College will ensure this dissertation is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University
Ames, Iowa
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DEDICATION

To my mom and dad for their support, love, curiosity, and passion for food and adventure. To Bebe for trying to visit me in Nepal even after the April 25th earthquake, and then for compelling me to swim everyday when our Nepal visit did not work out. To Lulu and Tillie for keeping play time real, and for bubble tea. And finally to Jane, for being you.
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LIST OF ABBREVIATIONS

ACAP ....... Annapurna Conservation Area Project
CAMC ......... Conservation Area Management Committee
DADO ......... District Agriculture Development Office
DDC .......... District Development Committee
FPE ........... Feminist Political Ecology
LI-BIRD ....... Local Initiatives for Biodiversity, Research and Development
MOLE ........ Ministry of Labour and Employment, Government of Nepal
NTAG .......... Nepali Technical Assistance Group
USAID ........ United States Agency for International Development
VDC ........... Village Development Committee
WEAI ........ The Women’s Empowerment in Agriculture Index
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ABSTRACT

Drawing on research conducted in two villages of Lamjung District in the mid-hills of Nepal, this thesis examines how social structures of caste, ethnicity, and gender, as well as land tenure affect the conservation of traditional rice varieties. Resource-poor farmers in Nepal possess a great wealth of traditional rice varieties. While subsistence farmers continue to maintain a large portion of Nepal’s rice varieties, these individuals represent poor, marginalized members of society. As populations flee rural areas for urban conveniences and economic opportunities abroad, the social dynamics of subsistence farming are shifting. The agricultural landscape of Lamjung has traditionally been dominated by ethnically Gurung landowners. However, both women and marginalized Dalit tenant farmers play increasingly important roles in traditional paddy production systems. Local agricultural programs, policy, and development opportunities remain geared towards male landowners. Understanding how social differences of caste, gender, and land tenure operate at the landscape level have the potential to improve conservation efforts as well as other agricultural development programs. This thesis examines these intersections and finds that the social change process of outmigration has the potential to significantly impact rice diversity in Lamjung.
CHAPTER 1. INTRODUCTION

Khana khanu bhayo (Have you eaten)? an older Gurung woman asked me and a friend as we walked down the trail in Nepal’s mid-hill district of Lamjung, exploring potential field locations for my research on traditional rice varieties amidst global change. This Nepali phrase—used to convey Are you well?—refers specifically to the act of eating rice, and it reveals just how fundamental rice is to the Nepalese people, to their diverse cultures (for there are many in a country about the size of Iowa), and to the country’s agriculture. In the face of environmental and social change, subsistence farmers throughout Nepal continue to maintain hundreds of traditional rice varieties. However, these individuals tend to be poor and marginalized members of society who are increasingly drawn off farm in search of greater economic opportunities (both abroad and domestically). Outmigration in many Nepali districts shapes agricultural landscapes, affecting who remains on the land to farm, what food they grow, and who benefits from agricultural production.

With large numbers of working-age men migrating out of Nepal, demographics and decision-making in Nepal’s rural communities are changing (Gartaula et al., 2010; Maharjan et al., 2012). This shift has the potential to alter land use practices, the conservation of traditional rice varieties, and the actualization of agricultural development policies. This thesis examines social and agroecological characteristics of two paddy-growing communities with rich intra-species rice diversity in Nepal’s mid-hill district of Lamjung. The two cases in this study provide an example of how normative social structures such as caste and land tenure status map on to agroecological

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1 See Appendix 3 for some commonly used Nepali words and phrases used in this thesis.
characteristics such as paddy-productive land, irrigation access, and soil erosion, revealing a socio-spatial hierarchy at the agroecological level. While the social-agroecological processes and interactions mentioned above occur at the landscape level, they have implications for the conservation of Nepal’s in situ rice diversity.

Despite the important role rice plays in the lives and landscapes of Nepal’s people, how outmigration intersects with the conservation of traditional rice varieties has been under researched. By using rice varieties as a lens through which to examine social, agroecological, and development opportunities, this study illustrates how a farmer’s location in the landscape determines their access to resources such as paddy-productive land, irrigation, and agricultural development projects. By examining the social change and land tenure arrangements occurring in Lamjung, this thesis asks, how does a farmer’s village of residence reveal positions of subjectivity within the agroecological landscape? Drawing on social and agroecological processes of paddy production, this study identifies key variables that impact future landrace conservation efforts. A secondary goal of this study establishes a baseline of social-agroecological processes and interactions that could help future development programs address gaps in policies and programs.

In Nepal, a complex caste and ethnic system of social hierarchy has evolved. This system permeates rural agroecosystems and affects land management. The caste system benefits certain populations over others in terms of access to education, economic opportunities, and land ownership. Despite the formal abolishment of the caste system, Dalits (formerly known as the “untouchable” castes) continue to suffer from food- and water-based discrimination as well as from other forms of discrimination, including spatial segregation at a village level. In addition to this residential segregation from
traditional ethnic villages, Dalits are often landless or semi-landless. This lack of ownership in farming land often leaves sharecropping as the principle means of procuring a household’s food supply. With Dalit tenant farmers living in more marginalized farming locations, their isolation from paddy-productive land results in not only decreased opportunities for household food security and agricultural development, but also perpetuates systems of inequality and poverty. I argue that normative expectations surrounding a farmer’s residential location and land tenure status contribute to continued subjugation of the most marginalized subsistence farmers. Paradoxically, by eschewing agricultural development efforts, the continued subjugation and dependency of Dalit sharecroppers act as a conservation mechanism for traditional rice landraces.

In Lamjung’s Ghanpokhara Village Development Committee (VDC) two neighboring villages, Bhache and Roplephant, sit approximately 1.61 kilometers (1 mile) apart. Farmers in these two villages grow an abundant number of rice varieties, many of them traditional landraces, commonly known as farmer’s varieties—varieties that have been developed by local farmers to meet their own unique growing conditions and specific needs. Despite Bhache and Roplephant’s physical proximity and shared interest in local paddy production, social and agroecological differences between the two villages have created unequal farming opportunities for the inhabitants of these communities. Hierarchies of caste and landownership and spatial segregation intersect in uneven ways for residents in these two villages. A development paradox emerges that provides the unintended material benefit of traditional rice conservation because development outreach targets landowners, not the sharecroppers who play an integral role in
Ghanpokhara’s paddy production. As a result, the symbolic meaning of spatial interactions takes on significant socio-natural consequences (Nightingale, 2011).

While studies have examined why subsistence farmers grow diverse varieties of the same species (Bellon et al., 1997; Sthapit et al., 2008), little research has been done on how outmigration and agricultural development projects affect crop diversity. Additionally, many agrobiodiversity studies tend to homogenize farmers as “smallholders” (Brush & Perales, 2007; Isakson, 2009; Zimmerer, 2013)—with little or no distinction of how normative social structures such as gender, class, or caste, or how land tenure status can impact not only farmers’ priorities, but also their access to resources and opportunities. This study focuses primarily on the normative structures of caste and land tenure in its examination of outmigration and traditional paddy farming. Even when non-landowners are recognized as managers of agricultural landscapes, differences between these farmers and land owners are not explored (Zimmerer, 2014). The homogenization of farmers as a group (of land owners) with similar motivations ignores significant cultural and environmental differences that impact crop diversity. The assumption that land owners and tenants have equal power and control over farming decisions and labor impacts potential conservation efforts. Similarly, ignoring unequal opportunities and access to resources (both agroecological and development-oriented) perpetuates social injustices that have material consequences.

A Feminist Political Ecology Conceptual Framework

Within this intersecting socio-agroecological context, feminist political ecology (FPE) provides a framework for examining relationships between nature and society (Elmhirst, 2011a; Nightingale, 2011). By encouraging an examination of power relations
at multiple scales, particularly important to environmental as well as development policies and programs, feminist political ecology highlights the politicized interconnected nature between environmental and social conditions. Policies and practices can have uneven, gendered impacts in natural resource governance (Elmhirst, 2011a; Elmhirst & Resurreccion, 2008). Similarly, this thesis posits that by targeting farmers as a homogenized group of individuals, agrobiodiversity conservation literature (as well as Nepal’s agricultural development strategy) reflects both omissions and inequalities that must be addressed for conservation efforts to attain success.

Using feminist political ecology as a means to deconstruct the notion of farmers as a homogenous group, this study aims to show that the grouping of farmers as a single representative unit negatively impacts both crop conservation efforts and development. With outmigration altering who remains in Lamjung to farm, the distinction between landowner and sharecropper could alter decision-making as well as development efforts. Motivations for growing certain rice varieties are not uniform at the local level within Ghanpokhara VDC. Farmers are compelled to grow different varieties based on environmental conditions as well as social conditions, access to land, and household size.

Drawing specifically on feminist political ecology, this study engages with critical scholarship that destabilizes the homogeneity of “community,” “household,” and “local” (Rocheleau, 2008) and, similar to many works of political ecology, operates with a strong commitment to social justice. While this study does not explore gender differences per se, it does use feminist theory to critique agroecological differences among groups and the resulting dispossession of these groups (Nightingale, 2012). In Nepal, social and power relations frequently interact in the context of land management (Nightingale, 2003,
Elmhirst (2011b) found that normative subjectivities (such as gender and caste) can be produced and reproduced through one’s access to resources (such as land or forest resources). By extension, social and power dynamics, and caste subjugation, also have the potential to affect varietal selection and complex systems of paddy management. By using land tenure status and caste as critical variables affecting out-migration and rice diversity, this study attempts to give voice to more marginalized Dalit tenant farmers, thus removing their veil of invisibility and altering structural inequalities that persist at multiple scales.

While there is no uniform understanding of what political ecology is, most scholars agree on a number of attributes that characterize a work of political ecology (Robbins, 2012; Goldman and Turner, 2011; Rocheleau, 2008). Some key traits as identified by Goldman and Turner include:

“1. A commitment to incorporating understandings of the biophysical processes that underlie environmental change and the availability of natural resources

2. An emphasis on understanding environmental politics as geographically and historically situated (i.e. the “case study” approach)

3. Strong commitments to social justice.” (2011, p. 7)

Rocheleau (1995; 2008) differentiates feminist political ecology (FPE) from political ecology. FPE recognizes multiple actors in a system (e.g. people of different castes, classes, or gender) and that these actors may have different uses for resources based on their social structures. Rocheleau also highlights that both actors and use value have a “physical and spatial relation [...] to the landscape” (1995, p. 10). She also emphasizes the importance of bridging academic work with policy.
This paper uses the FPE conceptual framework as articulated above in its analysis of the intersection of social and agroecological processes in Ghanpokhara. This approach allows an examination of the contingent power dynamics among different caste and ethnic groups as they play out across the paddy producing landscape of Ghanpokhara. This conceptual framework also recognizes that farming in Nepal’s mid-hills is inherently both political and unjust. Because social, agroecological, and political dynamics intersect in Ghanpokhara’s paddy producing landscapes, FPE offers a multi-scalar approach that embraces a critical view of these intersections and allows this work to criticize the power structure as it plays out through landscape-level processes.

**Thesis Outline**

The chapters that follow provide the background and foundation needed to understand the complex socio-agroecological system of Ghanpokhara’s paddy producing landscape. I have organized the thesis in the following way: Chapter Two provides a literature review of feminist political ecology; agrobiodiversity, smallholder homogeneity, and outmigration and; critical development. Chapter Three gives readers the contextual background for situating this study within Nepal’s mid-hills; Chapter Four explains the methodological processes involved in this study; Chapter Five examines the results of the study, finding socio-spatial segregation in paddy farming in Ghanpokhara; Chapter Six continues examination of results with an analysis of institutional elements of agricultural development in Ghanpokhara; Chapter Seven concludes this thesis with a discussion of the results.
CHAPTER 2. LITERATURE REVIEW

To understand why social and agroecological differences matter to the conservation of agrobiodiversity, the literature in this chapter examines three key areas. First, this chapter expands on the discussion of feminist political ecology as a conceptual framework for examining agrobiodiversity conservation and development. Second, the chapter conceptualizes agrobiodiversity and provides an understanding of how scholars approach and present agrobiodiversity research. It highlights how agrobiodiversity research fails to recognize the diversity of peasant smallholders which, in the context of social change processes such as outmigration, has implications for crop conservation and loss. Third, it examines critical development literature to better understand how top-down approaches to development can neglect and perpetuate context-specific inequalities and marginalization. In closing this chapter, I elaborate on Nepal’s Agricultural Development Strategy. This example of top-down planning in Nepal sets the stage for the second results chapter of this thesis by highlighting a classical approach to development. Engaging with these literatures allows me to address how social differentiation exacerbated through the outmigration of certain demographics impacts the conservation of traditional crop varieties.

**Feminist Political Ecology**

Given that policies and practices can have uneven, gendered impacts in natural resource governance (Elmhirst, 2011), the use of feminist political ecology (FPE) as a theoretical framework to question social structures within agrobiodiversity conservation and development is a natural fit. With the increasing feminization of agriculture in many parts of the world, feminist political ecology has the potential to influence the way
researchers examine smallholder interactions—both socially as well as ecologically. While this thesis project does not explicitly address issues of gender, it uses FPE’s critique of power to challenge hegemonic notions of smallholder uniformity to highlight farming differences by caste and land tenure status. Just as agriculture is increasingly feminized, outmigration from rural farmland also has an impact on farming demographics (Gartaula et al., 2010; Maharjan et al., 2012). By mapping caste and land tenure status on to FPE’s gendered perspective, this thesis expands FPE to include other social hierarchies of power.

Feminist political ecology offers a means to examine environmental and ecological differences between groups (Nightingale, 2012). Agrobiodiversity literature often focuses on system resilience (de Boef et al., 2013; Zimmerer, 2013, 2015; Zimmerer et al., 2015). Social theory and critiques of power problematize agrobiodiversity and development scholarship framing on resilience by challenging simplifying notions of resilience and sustainability, asking, “Resilience of what? Resilience for whom?” (Lebel et al., 2006; Cote & Nightingale, 2012). By encouraging an examination of power relations at multiple scales, particularly important to environmental as well as development policies and programs, feminist political ecology highlights the politicized interconnected nature between environmental and social conditions. Feminist political ecology scholarship adds an important critical element to both agrobiodiversity and development scholarship.

Feminist political ecology accepts that there can be a multiplicity of resource users (Rocheleau, 1995), or smallholders, thus breaking up the homogeneity of the “smallholder” to reveal microscales of power between male, female, landowner, tenant,
sharecropper, as well as between those of different castes. This expands FPE’s destabilization of “household,” “local,” and “community” (Rocheleau, 2008).

Additionally, feminist political ecology recognizes that there can be multiple uses for resources (Rocheleau, 1995). In the context of agrobiodiversity and Nepal, this means that individual smallholders may have different uses for and motivations behind selecting specific rice varieties. By exploring how different demographics value and use genetic resources, development planners can focus programs and policy to reflect the changing patterns of agricultural stewardship. Because cultural identity shapes preferences and tastes for a specific crop or species (Sthapit, 2008; Brush, 2004), understanding the shifting patterns of agricultural stewardship should lead to more inclusive, comprehensive conservation programs. Just as urban planners argue that residents develop their knowledge of cities through use and experience (Fenster & Yacobi, 2005; Lynch 1960), different farmers within a community use and value resources differently.

Rocheleau (2008) offers key characterizations of FPE, highlighting the use of a variety of participants at different positions of subjectivity; multi-scale analysis; the “integration of social and biophysical analysis of power relations and environment” (p. 718); empirical observations at the household and local level; and explanations that fuse structure and agency. She emphasizes the importance of bridging academic work with policy, an issue also articulated by development planners. These politically charged attributes of FPE fill a gap in agrobiodiversity scholarship through active engagement with normative power structures and critical theory.

FPE also provides a framework for examining relationships between nature and society (Elmhirst, 2011; Elmhirst, 2015). By destabilizing essentialist perspectives on
resource use and management, FPE addresses the “embeddedness of local gendered
environmental struggles in regional and global political economic contexts” (Elmhirst &
Resurreccion, 2012, p. 7; Rocheleau et al., 1996; Schroeder, 1999). Situating local
struggles within greater political economic contexts also broadens both agrobiodiversity
and development frameworks, accounting for political characteristics and their inherently
unequal power hierarchies.

Increased use of feminist theory also allows researchers using agrobiodiversity
and development frameworks to include positions of reflexivity and positionality
(Elmhirst, 2015; Haraway, 1990; Rose, 1997). Positioning oneself in a particular context
for the production of knowledge challenges conventional notions of research design and
analysis. Such reflexivity and positionality provides researchers and planners a
framework for understanding the complexities of place and of different actors within a
place. It also makes room for differences between how observers of and actors within
landscapes understand and use them differently (Williams, 2014). While agrobiodiversity
scholarship embraces local knowledge production, the addition of reflexive positionality
recognizes the power associated with the crafting of research questions and modes of
observation and analysis. This approach answers a call within planning literature to not
only recognize the multiple forms that knowledge can take, but also to make space for
this multiplicity within planning processes (Rydin, 2007). Feminist political ecology
expands agrobiodiversity’s homogeneous variables such as “smallholder” and resource
users, and contributes a valuable dimension of complexity to both agrobiodiversity and
development scholarship.
Agrobiodiversity, Smallholder Homogeneity, and Outmigration

Brookfield and Stocking (1999) defined agrobiodiversity in terms of interactions between agricultural management practices, farmers’ resource endowments, bio-physical resources, and species. Wood and Lenné (1999) defined it as the diversity of living organisms (plants, animals, bacteria, etc.) used in agriculture. The FAO (2004) expands on previous conceptualizations of agrobiodiversity by including not only the diversity of plant and animal genetic resources and soil microbes, but also by emphasizing that people, too, make up part of our natural agricultural system and should therefore be included in conceptualizations of agrobiodiversity (FAO, 2004). For this thesis I focus on one aspect of agrobiodiversity—intra-species crop diversity—and the farmers who manage this diversity. The landraces, or farmers’ varieties, that compose much of the world’s crop genetic diversity have been developed over many generations by indigenous farmers (Cleveland and Murray, 1997). The role of smallholder farmers in the continued maintenance of the planet’s crop germplasm is integral to agrobiodiversity conservation.

Addressing different dimensions of agrobiodiversity conservation requires recognizing the complexity of agroecosystems. Conway (1987) provides a conceptual understanding of an agroecosystem as a bounded hierarchical agro-socio-economic-ecological system. This broad conception of an agroecosystem emphasizes the multiple dimensions that affect agroecosystem resilience and sustainability while recognizing that each system is unique. In the context of Nepal, variations in different agroecosystem elements have led to many unique traditional farming systems that sustain the farmers who maintain them (Maikhuri et al., 2001). This highly localized approach to agroecosystem analysis recognizes that system variation exists and that various elements
intersect in different ways depending on local contexts. The contextual importance and complexity of agroecosystem dynamics and functioning mirrors the localized, multi-dimensional nature of crop agrobiodiversity.

Conservationists distinguish in situ (or on-farm) conservation from ex situ (or gene bank) conservation efforts. Scholars articulate the need for in situ conservation because crops continue to evolve and respond to real-world environmental conditions. Genetic diversity provides a greater chance of species adaptability to climate change or other environmental stresses (Sthapit et al., 2010). Perales et al. (2003) found that in situ management of local landraces is dynamic and continues to depend on farmers; they argue that the goal of conservation is not to maintain historic varieties or static genetic conditions, but to foster the open process of genetic evolution. A large portion of the world’s crop genetic diversity is maintained by peasant farmers in multi-use agricultural systems (Altieri et al., 1987). The continued conservation and evolution of crop germplasm depends on the participation of these farmers and on their willingness and ability to grow their traditional cultivars. Scholars highlight that it is the farmers who maintain this diversity, not development or conservation programs, although the latter may design interventions to influence agrobiodiversity management by farmers (Perales et al., 2003).

Aldo Leopold (1949) writes that economic self-interest “tends to ignore, and thus eventually to eliminate, many elements in the land community that lack commercial value, but that are (as far as we know) essential to its healthy functioning” (p. 251). With the push to industrialize agriculture, expand productivity, and bring emerging economies into the global market place, traditional farming systems have undergone significant
change in the last 60 years (Bonano & Busch, 2015). Since the 1900s the world has lost 75% of plant genetic diversity as farmers have transitioned to more uniform varieties (FAO, 1999). The disappearance of these farmer’s varieties, or landraces, has implications for future food security, agroecosystem provisioning, and for the maintenance of agrobiodiversity-associated cultural knowledge and use values (FAO, 2009; Jackson et al., 2007; Momsen, 2007; Pant & Ramisch, 2010). Continued on-farm, or in situ, maintenance of the world’s landraces depends on farmers’ active management of these valuable resources (Bellon et al., 1997). Despite attention to agrobiodiversity conservation, scholars gloss over social difference as an important factor in the maintenance of crop biodiversity.

Different users have different values for landraces and their crop genetic diversity. Plant breeders and farmers both value landraces for specific traits (such as drought tolerance, heat or cold resistance, pest or disease resistance), their adaptability (either social or ecological), or for their overall diversity (Brush and Meng, 1998; Gauchan et al., 2006; Smale, 2006). Farmers distinguish landraces based on their gastronomic characteristics more often than on morphological characteristics (Nazarea-Sandoval, 1991). Many studies have shown that cultural preferences and practices play a vital role in the conservation of biodiversity within agroecosystems (Pant and Ramisch, 2010; Sthapit et al, 2008). Pant & Ramisch (2010) found that social structures (e.g. caste, gender, class) contributed to agrobiodiversity management because of “culinary, medicinal, symbolic, and spiritual values of crop varieties” (p. 92). Despite the recognition that social structures and cultural preferences can influence agrobiodiversity preferences, studies neglect social difference based on land tenure status and often gloss
over important social differences such as caste, ethnicity, or class tied to land access and intra-species crop diversity. My study attends to this gap in the literature.

Many agrobiodiversity studies tend to homogenize farmers as “smallholders”—with little or no distinction made for normative social structures such as gender, class, or caste, or for land tenure status (eg: Brush & Perales, 2007; Isakson, 2009; Zimmerer, 2013). As mobility levels among individuals differ (Rao, 2006), those with more restricted mobility—such as women, Dalits, and sharecroppers—may play an increasing role in smallholder farming systems. Landownership can empower marginalized farmers with greater household decision-making (Allendorf, 2007; Agarwal, 1994), yet in many places these groups have relatively little access to land ownership (Chombaa et al., 2016; Rao, 2006). Additionally, Subedi et al. (2003) found that farmers who play a central role in seed distribution tend to have a wealthier economic status. Conservation and development-oriented programs often direct their efforts towards existing systems of land ownership, reinforcing the inherent inequality of these systems (Chombaa et al., 2016). Even when non-landowners are recognized as managers of agricultural landscapes, varietal use preferences between these farmers and landowners are not explored (Zimmerer, 2014). The homogenization of farmers as a group (of land owners) with similar motivations ignores significant cultural and environmental differences that impact crop diversity.

Many countries, including the United States, have documented rural outmigration and agricultural land cover change (Brown et al., 2005; Gray, 2009). These outmigration patterns alter the places smallholders leave behind (Adger et al., 2002; Gray, 2009; Schmook & Radel, 2008). Because of changes in labor availability, migration can change
land use patterns (Rudel et al., 2002). Despite the ubiquity of outmigration from rural hinterlands, few studies examine social differences resulting from smallholder outmigration and how the outmigration of certain demographics affects farming systems. Structural transitions within the political economy of food and agriculture have changed the intensity of agricultural production, transitioning farmers away from subsistence farming towards greater production of cash crops. Such economic-oriented agricultural policy shifts can combine with social processes of change such as outmigration to impact land use and resource conservation. In migration literature, researchers frequently focus on where migrants are going (Winders, 2014), highlighting a prioritization of “developed” over “developing.” Studies often examine assimilation into receiving countries, policies affecting migration, and the processes and decision-making surrounding migration. Such a strong focus on destination countries leaves the complexities of sending locations and the impacts of migration on traditional farming systems vastly under studied. This study also attends to this gap.

Migration, often examined in terms of “push” “pull” factors, can also be thought of as a “driver” in land change science. This expanded conception of migration brings it into the realm of land use and can posit migration as a powerful cause of land use and land cover change. When migrating families decrease the amount of hectares they cultivate, this can lead to land use change (Schmook & Radel, 2008). Adger et al. (2002) argue that migration alters the sustainability of resource bases. Their study focuses on social resilience, revealing that diversification and higher incomes from remittances

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2 Turner et al. (2007) describe land change science as an “interdisciplinary field seek[ing] to understand the dynamics of land cover and land use as a coupled human–environment system to address theory, concepts, models, and applications relevant to environmental and societal problems, including the intersection of the two.”
improve social resilience, but increasing social inequality undermines gains in social resilience. They also highlight that migration is often overlooked in population-environment debates. These social-ecological combinations emphasize the potential of expanding migration scholarship by drawing attention to the agroecological ramifications of outmigration. While migration has for a long time been tied to market phenomena (Stark & Bloom, 1985), the finding that migration alters resource bases (Adger et al., 2002) is of particular importance when we consider intra-species crop diversity. A loss of crop diversity’s resource base would indicate a regime shift from one state to another, making the loss of crop genetic diversity and the cultural diversity tied to specific crop varieties difficult to regain.

The gap in scholarship that arises from the homogenization of smallholders in the context of agrobiodiversity conservation leaves unanswered the question of how outmigration from rural hinterlands alters natural resource bases in these places. By homogenizing smallholders, agrobiodiversity scholars fail to account for social change and possible implications for present and future agrobiodiversity conservation efforts. As cultural identity shapes preferences and tastes for a specific crop or species (Sthapit, 2008; Brush, 2004), understanding the shifting patterns of agricultural stewardship should lead to more inclusive, comprehensive conservation programs. By exploring how different demographics value and use genetic resources, development planners can focus programs and policies to reflect the changing patterns of agricultural stewardship. Adjusting programs to reflect this paper’s findings could help Nepal conserve its rich diversity of traditional rice varieties and could help other countries address changes in their farming systems. By looking at smallholder differences of caste, ethnicity, and land
tenure status, this study aims to craft a more complete narrative of who maintains crop diversity, calling into question what conservation means to those doing the conserving.

**Development**

Just as some scholars contribute a critical angle to systems resiliency scholarship by asking, “Resilience of what? Resilience for whom?” (Lebel et al., 2006; Cote & Nightingale, 2012), the same questions arise when we consider development and planning: Development of what? Development for whom? Development frequently comes across as a system of knowledge, power, and expertise (Mitchell, 2002). This challenges not only notions of who controls development, but also calls into question how priorities are set, who benefits from distribution of resources, and how localized practices and expertise can be integrated into development frameworks (Leal, 2007; Miraftab, 2009).

International aid agencies and financial institutions such as the World Bank and International Monetary Fund (IMF), as well as nation-states make claims about development benefitting local communities. However, development schemes often fail to account for exactly how localities are impacted by development, either making claims of outright development failure or success; even in failure, development projects have “instrument effects” that often go unrecognized or acknowledged (Ferguson, 1990). Development can cause changes in land use, natural resources, and communities. This thesis challenges top-down institutional approaches to development planning by critiquing agricultural development and conservation practices that negate or ignore local contexts, desires, and needs.
By embracing a communicative planning approach to agricultural development and agrobiodiversity conservation, this thesis aligns with Patsy Healey’s conceptualization of planning and governance:

I understand planning as a governance activity occurring in complex and dynamic institutional environments, shaped by wider economic, social and environmental forces that structure, but do not determine, specific interactions. By governance, I [mean] the processes by which societies, and social groups, manage their collective affairs. (2003, p. 104)

Such an approach to conservation and development makes room for taking natural resources and local contexts into account in decision-making and land management. It also highlights a tension between institutional and social-environmental forces structuring human societies. As Goldman (2005) points out, development finance institutions such as the World Bank depend on development for their very survival. This challenges conventional notions of development by questioning how institutions who themselves rely on development for their salaries and survival can adequately represent local interests. Attention to the tension between institutional forces and local-level processes and structures (Carmody & Owusu, 2016; Goldman, 2005; Healey, 1997; 2003) can add a dimension of social justice to not only the outcome of policy making and development, but also to the processes that bring about policies and resource distribution (Healey, 1997).

Foreign development institutions influence many developing countries’ agricultural sectors, land management strategies, and their integration into a neoliberal “global economy” (Bonanno & Busch, 2015; Owusu, 2003; Stiglitz, 2002). Reasons for international support in the form of foreign aid or policy-shaping are varied and can include poverty eradication, foreign policy strategies, commercial interests, political
ideologies, or economic development (Robinson & Tarp, 2000). Foreign involvement may also include agricultural restructuring to accommodate global market integration (Bonanno & Busch, 2015). Despite both funding and attention, development projects are often accused of neglecting to take local contexts into account (Li, 2014; Mitchell, 2002; Ferguson, 1990; Goldman, 2005). Development and development interventions can both ignore (Yeh, 2007) and reinforce local politics (Li, 2014) and can produce “distributive injustices” (Healey, 2003, p. 104). Local-level processes and social hierarchies are often ignored for the sake of wide-sweeping projects intended to improve livelihoods and raise farmers out of poverty. Through a development agenda, modernity becomes an issue of control and power (at local, national, and global levels) and demonstrates how nation-states form and portray themselves in a globalized context (Mitchell, 2002).

The following sub-section highlights Nepal’s top-down agricultural strategy and rejects its premise in favor of peasant farmers’ context-specific needs and desires.

**An Example of Top-Down Planning**

Focusing agricultural development in Nepal specifically in the context of rice production provides a stark example of how development becomes a project of modernization and top-down decision-making. Rice cultivation takes place on nearly half of Nepal’s cultivable land (Agribusiness, 2013). At one time farmers cultivated thousands of local rice landraces, but since the opening and initial development of Nepal’s economy beginning in the 1950s (Osmani & Bajracharya, 2007) and the introduction of modern rice varieties in the 1960s (Mallick, 1981 in Gauchan et al., 2012), the number of local landraces grown by farmers has shrunk to hundreds (R. Rana, personal communication, 2014). Nepal’s Agricultural Development Strategy (ADS) 2014 (MOAD, 2014) and its
National Seed Vision 2013-2025 (Seed Quality, 2013) aim to increase the amount of improved seed used by farmers. The ADS is based on a technical report funded by the Government of Nepal, with help from a Who’s Who list in development including thirteen different international and transnational agencies³ (MOAD, 2014).

This group of government-sponsored agencies highlights a colonial approach to aid and development. With the document drafted in English, a universal language of development, that a majority of the Nepali population cannot read, the ADS itself raises many questions: For whom was the strategy written? Who stands to benefit? Who participated in its creation? These questions highlight a common feature of development programs that discount local level phenomena and the needs of subsistence farmers. The policy and program goals of Nepal’s ADS raise questions because they failed to account for local social and agroecological contexts. With the push for modern and improved seed varieties, Nepal’s ADS fits a top-down model of development that neglects context-specific needs of subsistence farmers and fails to take their expertise in farming and crop selection into account. By rejecting this top-down approach, this study focuses on local level processes affecting traditional rice varieties and the challenges facing the conservation of local rice landraces.

Agrobiodiversity scholarship which omits or ignores local smallholder diversity and social change mirrors top-down development planning that fails to account for local

³ These include: Asian Development Bank (ADB); International Fund for Agricultural Development (IFAD); European Union (EU); Food and Agriculture Organization (FAO); Swiss Agency for Development and Cooperation (SDC); Japan International Cooperation Agency (JICA); Denmark Agency for International Development (DANIDA); World Food Program (WFP); United States Agency for International Development (USAID); Department for International Development (DfID); the World Bank; the Australia Agency for International Development (AusAID); and the United Nations Entity for Gender Equality and the Empowerment of Women (UN Women) (MOAD, 2014).
perspectives. Using the feminist political ecology framework expanded above, this study attends to this gap in agrobiodiversity scholarship. By engaging with social hierarchies of land tenure and caste, this study begins an important step toward greater social inclusion in agrobiodiversity scholarship, programs, and planning. The combination of these three literatures contributes to a conceptual framework that can strengthen agrobiodiversity conservation and in situ crop diversity.
CHAPTER 3. SITUATING THE STUDY IN NEPAL

At 147,181 square km, Nepal is a relatively small country\(^4\) with an oversized richness of socio-cultural, ecological, and topographical diversity. Often described as a yam between two boulders\(^5\), Nepal finds itself geographically placed between the world’s two most populous countries: India to the South, and China to the North.

Ranging from altitudes of approximately 60m in the plains of the Terai bordering India to the 8,848m peak of Mount Everest on the border with Tibet Autonomous Region (China), Nepal’s socio-cultural diversity is as diverse as the country’s ecosystems and topography. Despite the country’s rich ecological and social diversity, almost 70% of Nepal’s 26.5 million residents are employed in the agriculture and forestry sector (World Bank, n.d.).

With 125 caste and ethnic groups, speaking 123 languages, Nepal has a great diversity of peoples (CBS, 2014b). The government of Nepal proudly promotes the country as the birthplace of Buddha. Both Buddhism and Hindu figure prominently in Nepal’s religious diversity, with many Nepalese practicing a mixture of Buddhist and Hindu rituals, not entirely distinguishing rituals as one or the other.

Nepal is divided into three agro-ecozones: the Terai, or plains; the mid-hills; and the mountains. Figure 1 shows the physiographic breakdown of Nepal into its different zones. Rice cultivation takes place at altitudes ranging from 60m to 3050m, including the highest elevation of rice cultivation on the planet (Joshi et al., 2008). The combined socio-cultural, topographic, and climatic diversity of the country contribute to Nepal’s

\(^{4}\)As a point of comparison, Iowa is approximately 145,746 km\(^2\).

\(^{5}\)This expression originated with Prithvi Narayan Shah’s description of Nepal to his heirs in 1775 regarding the country’s size and location squeezed between China and India.
great diversity of landraces, or local farmer varieties. Table 1 shows the high crop genetic resources for the three different agro-ecozones.

Table 1  Food crop genetic resources in agro-ecozones of Nepal

<table>
<thead>
<tr>
<th>Zones (altitude)</th>
<th>Food crop genetic resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terai (60-1000m)</td>
<td>rice, maize, wheat, chickpea, pigeonpea, lentil, jute, niger, sesame, perilla, wild relatives of rice, sugarcane, finger millet, eggplant, okra, grass pea etc.</td>
</tr>
<tr>
<td>Hill (1000-3000m)</td>
<td>rice, maize, wheat, barley, naked barley, foxtail millet, buckwheat, ricebean, finger millet, blackgram, soybean, field peas, perilla, niger, sesame, Brassica species, wild relatives of buckwheat, amaranths, finger millet, ricebean, pigeonpea etc.</td>
</tr>
<tr>
<td>Mountain (3000-8848m)</td>
<td>cold tolerant rice, proso millet, wheat, naked barley, maize, buckwheat, amaranths, chenopods, ricebean, blackgram, soybean, field peas, radish, sesame, Brassica species,</td>
</tr>
</tbody>
</table>

Source: Gupta (2012, p. 70)

A Brief Recent History

The recent political history of Nepal is complicated and tumultuous. Accessing consistent, accurate historical overviews of Nepal’s history and rendering this history as more than a simple recitation of Nepali names can be difficult. In the context of Nepal’s complex history, John Whelpton (2005), wrote a survey of Nepal’s history (mostly from the mid 1700s on) that considers more than simply the formation of the nation-state and a compendium of Who’s Who of Nepal by including references to ethnic, caste, gender, the physical environment, and development issues. The recognition of this book as an “excellent contribution to Nepal studies” (Robertson, 2005, p. 49) and its wide use by scholars on Nepal led me to use it as the basis for providing my own brief overview of Nepal’s more recent history. The publication of the book in 2005 came before the end of
Nepal’s People’s War. For the more recent history (after the palace massacre of 2001) I have indicated the sources in the text.

The Shah dynasty reigned in Nepal from the mid 1700s to 1816. During this time Prithvi Narayan unified several valley kingdoms around Kathmandu and, in 1769, established Kathmandu as the capitol city. His policies locked out the British who were then in neighboring India. After Prithvi Narayan’s death, his successors continued the expansion of the Nepali kingdom. However, they met with confrontation from the British and eventually signed the Treaty of Sagauli in 1815/1816 with the British East India Company, giving much of the Nepal Kingdom to the British (Whelpton, 2005).

The Ranas ruled Nepal from 1816 through the mid-20th century. The Rana dynasty ruled Nepal as hereditary Prime Ministers with tight fists, keeping the borders closed to outsiders and severely limiting development—both in terms of infrastructure as well as education and economic opportunity. During this time Nepalis living abroad, primarily in India, started political parties, including today’s Nepali Congress party, and prepared to overthrow the Ranas.

In the early 1950s, King Tribhuvan (Shah) was able to orchestrate the ouster of the Ranas and their autocratic rule and restore himself and the Shahs back to power. He briefly attempted to rule in conjunction with a parliamentary democracy. The early 1950s are generally recognized as the beginning of Nepal’s modernization. In 1960, King Mahendra over threw the elected government and formed the Panchayat (council) system, making political parties illegal. Throughout this Panchayat system King Mahendra maintained control of the country.
His son, King Birendra, succeeded his rule in 1972 and during his rule carried out political reforms. The early 1990s brought a strong pro-democracy movement, as well as continued disappointment. King Birendra ended the partyless Panchayat system and in 1991 Nepal elected its first multi-party parliament since the 1950s, but the promised reforms failed to bring substantive change to those living in more rural areas. After the early protests, rural poor of Nepal began to expect more equality and social progress. However, with continued oppression and overwhelming injustice, people began organizing and protesting.

The Communist Party of Nepal (CPN) launched the People’s War against the state in 1996. This conflict, at first seen by the government as a nuisance, lasted from 1996 to 2006. According to the UN High Commissioner for Human Rights (UNOHCHR, 2012), approximately 13,000 Nepalis were killed—many by the Nepali government—and 1,300 went missing as a result of the conflict. During the conflict “many individuals and families were displaced from their homes; there were large-scale disruptions to education, health and basic government services across the country; economic hardships were further exacerbated by the conflict; and instability and a climate of fear were widespread” (UNOHCHR, 2012, p. 4). In 2006, the conflict between the Government and the Communist Party of Nepal (Maoist) officially ended and the former Hindu Kingdom of Nepal became a secular state (United Nations Development Programme, n.d.).

In 2001, in the midst of the conflict, Prince Dipendra killed his father, King Birendra, along with eight other members of his family. After the Royal Massacre, King Gyanendra took over the throne and would remain as king until the formal abolishment of
the monarchy in 2008 when Nepal finally became the Federal Democratic Republic of Nepal.

Because of disagreements in the Constituent Assembly, particularly regarding the demarcation of states, the Interim Constitution of Nepal 2007 would remain in use until September of 2015, when, on September 20th, Nepal finally promulgated the Constitution of Nepal (Constitution of, 2015). Despite long in drafting, the new constitution remains highly criticized for its gender inequality regarding citizenship by descent as well as for the boundaries drawn for statehood (Pandey, 2015; Call to, 2015). Massive protests and blockades occurred along the Nepal-India border after the promulgation of the constitution, killing as many as 40 people (Constitution crisis, 2015; Haviland, 2015; Pandey, 2015). Madhesi and Tharus (from the Terai) as well as other Janajatis (indigenous ethnic groups) fear that the new constitution continues to exclude them from representation in government and threatens their culture and citizenship status (Haviland, 2015; Pandey, 2015).

The political instability over the past one hundred and fifty years and the country’s isolation up until the 1950s has impacted development levels and heightened the exclusion of indigenous ethnic and lower caste groups. It is possible that Nepal’s slow rate of development and neglect of its more remote hinterlands has prevented the more rapid adoption of modern rice varieties. The political turmoil and continued ostracizing of rural peasants from both development and the political process has likely contributed to the continued maintenance of Nepal’s rice landraces.
Regional Demarcations

Nepal has a complex geo-political structure made even more confusing by the turmoil of the country’s leadership. The new 2015 constitution divided Nepal administratively into seven states. The country is also broken down into five development regions and 75 districts. Each of these 75 districts are further subdivided into lower administrative units known as Village Development Committees (VDCs) and nagarpolika (municipalities). VDCs intend to foster community level participation in the development process and highlight the importance of villages as units of development. They serve as administrative units by either grouping a number of villages together, as is the case in Ghanpokhara VDC, the site of this case study, or are composed of a single larger village. Subunits of VDCs are wards. These wards also center around population groups, usually
at the level of a single village and its environs. Figure 1 shows Nepal’s development regions and districts, reflecting how many VDCs and nagarpolika each district contains.

**Lamjung District**

This study focuses on two wards within Ghanpokhara VDC in Lamjung District. Lying in the foothills of the Annapurna mountains, Lamjung’s varied topography and climate range from subtropical plains and fertile paddy fields in the southern part of the district bordering Tanhun district to the foothills of the Himalaya at its northern boundary with Manang district. Lamjung is located in the mid-hills agro-ecozone in the Western Development Region and contains 52 Village Development Committees (VDCs) and two nagarpolika. Figure 2 shows a map of Lamjung’s VDCs and land use. Lamjung’s eastern boarder is Gorkha district, where the epicenter of the April 25th, 2015 earthquake occurred. While quite close in proximity, most of the earthquake damage radiated east and not in a uniformly concentric pattern, thus sparing Lamjung from much death and destruction.
Lamjung has long been home to ethnic Gurung population which lives spread throughout the hills. Figure 3 shows the ethnic distribution in Nepal. The Gurung around Annapurna are represented in green in the upper center of Nepal. Large numbers of other castes such as Brahmin, Chettri, and Dalit as well as other ethnic groups such as Tamang also live in the hills and plains of this district. Like many in Nepal, residents in Lamjung practice a mix of Buddhism and Hindu, although Lamjung has a strong Buddhist influence and a number of Buddhist monasteries throughout the district.

The district headquarters of Lamjung, Besisahar, provides services that can rarely be found elsewhere in the district. Police, a hospital, banks, retail vendors, and hotels can be found in Besisahar. Just as importantly, government development offices are also located in Besisahar. These include Gharelu (Federation of Nepal Small Cottage and Industry),
District Development Committee (DDC), the Federation of the Nepali Chamber of Commerce and Industry (FNCCI), and the District Agriculture Development Office (DADO). The most important of these for the purpose of this study is DADO, which organizes programs and determines policy regarding district level agricultural development. This organization shapes agriculture programs within the district and works with extension outposts in the district.

Besisahar marks the end of the paved road coming up from the south. This road joins the district to the Prithvi Highway that links the capitol city, Kathmandu, to Pokhara further West. Pokhara is one of Nepal’s largest cities and frequently serves as a tourist base. To reach Besisahar from Kathmandu or Pokhara, microbus (large van) service is available that takes approximately 6 hours from Pokhara and 7 hours from Kathmandu.

One of Nepal’s protected conservation areas, the Annapurna Conservation Area, encompasses the Annapurna mountains, and spans five districts, including eight VDCs of Lamjung. The Annapurna Conservation Area Project (ACAP) is part of Nepal’s larger National Trust for Nature Conservation that oversees national parks and conservation areas throughout Nepal. ACAP’s regional headquarters is located in the largest Gurung settlement in the Annapurna Conservation Area, the picturesque and well-known Gurung village of Bhujung. Bhujung is a three-hour walk northwest from Bhache, the upper village of this research project, or a three- to four-hour jeep ride from Besisahar. ACAP monitors community forest use for fuel, fodder, food, and medicinal herbs; sponsors agricultural and development programs such as bee keeping, tea plantations, and aids in product marketing; sponsors poly tunnels for vegetable growing; assists in toilet installation; and participates in other development projects such as eco-tourism related
projects. ACAP also issues trekking and research permits and monitors the entry and exit of foreigners into the area. The Annapurna trekking circuit, the most visited trekking route in Nepal, circumnavigates the Annapurna mountains, bringing many tourists into the area.

The Gurung Heritage Trail passes through part of Lamjung. In the past the Gurung Heritage Trail has attracted mostly Nepali tourists, however foreign tourism is slowly increasing as foreigners seek more authentic opportunities. ACAP promotes many aspects of the Gurung Heritage Trail: local organic agriculture; local raksi (finger millet alcohol); wild (and domesticated) honey; local tea gardens; Gurung architecture; traditional Gurung culture and hospitality; Gumbas (Buddhist places of study and prayer); and views of the Himalaya. The beauty of Lamjung’s higher elevations, the uniqueness of its Gurung culture, and the remote yet accessible locations of its villages contribute to make Lamjung a special place to visit and live.

While the beauty and culture of the place are incontestably unique, the remoteness of many (if not most) villages within the district coupled with the limited development within these villages challenges inclusive development programs and projects. Most, but not all, villages have access to electricity. There is inconsistent cell phone reception in the villages and, except in Besisahar (and possibly in villages in Lamjung’s southern VDCs), internet access is only through cellular service. Houses have access to communal water taps or to outdoor taps shared among several houses. ACAP has been working to end open defecation and help install latrines in the VDCs where it works. Sanitation awareness is improving. Village schools do not have a good reputation, and those that
have the financial means to send their children to boarding schools in Besisahar or elsewhere are inclined to do so.

As shown in Table 2, Gurung is the majority population in Lamjung district. While Kami is not the only Dalit caste in the district, it is one of the largest population groups. In this study that focuses on two wards within Ghanpokhara VDC, the study participants are predominantly Dalit (Kami) and Gurung, which reflects the demographics found in these two villages and wards in Lamjung.

<table>
<thead>
<tr>
<th>Caste/Ethnicity</th>
<th>Percent of Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gurung</td>
<td>31.69</td>
</tr>
<tr>
<td>Chhettri</td>
<td>15.83</td>
</tr>
<tr>
<td>Brahmin</td>
<td>14.88</td>
</tr>
<tr>
<td>Kami (Dalit)</td>
<td>7.43</td>
</tr>
<tr>
<td>Tamang</td>
<td>6.73</td>
</tr>
<tr>
<td>Other (Combined)</td>
<td>23.44</td>
</tr>
</tbody>
</table>

Table 2  Caste/Ethnicity population percent for Lamjung District

Source: CBS, 2001

Agricultural Life in Ghanpokhara VDC

This study focuses on two of Ghanpokhara VDC’s nine wards, ward one, Bhache, and ward five, Roplephant. It can take several hours of walking up and down and back up what the Nepalese call hills (but what those of us from flatter terrain would consider mountains) to cover the distances between the VDC’s nine wards. Ghanpokhara VDC shares a name with one of the villages within the VDC, Ghanpokhara village. In this work Ghanpokhara VDC will be referred to from here on as simply Ghanpokhara, and the village of Ghanpokhara will specify “Ghanpokhara village” if it is mentioned.
Reaching Ghanpokhara from Besisahar can be strenuous. There are two principle ways to get there, depending on your destination. A 3-4 hour jeep ride travels the rough dirt road from Besisahar to Bhujung, stopping in Ward 9 and the village of Nayung, the second highest ward in the district and the only one with public transportation going directly through it. The jeep makes the trip whenever there are enough people to fill the seats. Foreigners must descend in the picturesque and eco-tourist village of Ghalegaun to register with ACAP before continuing on to Nayung. Nayung has a small hotel and a couple of small teashops. To reach wards one and five from Nayung, a trail leads down hill winding through forests and crossing over landslides. It takes about one hour walking down hill to reach Ward one and Bhache (altitude approximately 1536 meters), and another 30-40 minutes to get to Roplephant and ward five (altitude approximately 972 meters) along the Khudi river.

To reach Roplephant, the lower village where this study took place, directly from Besisahar, a one-hour bus runs from Besisahar through Khudi. In Khudi there is one hotel, two or three provisioning stores, and a few agricultural supply stores. From Khudi, Roplephant is a pleasant 40-minute walk up along the Khudi river. To reach Bhache and ward one, the other village and ward this study focuses on, from Roplephant, you walk one hour uphill on a trail mostly composed of stone steps. The time differences it takes between walking up and downhill reflect the steepness of the terrain and the amount of time it takes walking up rather than downhill.

At the time of this research, all but one ward in this VDC had electrical service. Wards One and Five receive their electricity from a hydropower project near the confluence of the Khudi river and the much larger Marsyangdi river. This hydropower
project has diverted most of the Khudi river into a pipe, taking away the livelihoods of fishermen and making upstream firewood collection (that villagers used to float down the river) difficult. However, the project has provided needed development by supplying electricity to villagers, bringing needed roads and bridges, and supporting the school and health post.

Snow is often seen on the hill tops surrounding the VDC, but rarely (if ever) does it freeze in the wards of Bhache or Roplephant. However, with limited electricity and heating resources, winter can still feel bitingly cold. For warmth in the evenings, people huddle indoors around wood-fired cook stoves. Improved cook stoves have been introduced and encouraged in many areas of Nepal, however, throughout my multiple stays in Ghanpokhara over the course of nine months in Nepal, most village kitchens did not have improved cook stoves, and kitchens could get quite smoky. Meat and, less frequently, fish are often cured and aged above smoky cook stoves.

Ghanpokhara’s temperate climate means villagers can grow a wide variety of food, ranging from household coffee, pomelo, and mandarins to staples like pulses, rice, and millet. Farmers pride themselves on the tastiness and diversity of their fruits, vegetables, grains, and legumes that grow in this area. In the past they traded local rice (and possibly other foods) for salt from further north, more recently farmers traded their “tasty local rice” for sought-after potatoes and beans from Manang district, on Lamjung’s northern border.

Despite irrigation differences reflected in the types of fields that Roplephant and Bhache have, both places can grow food year round. Roplephant’s khet, or irrigated fields, provides them with more stable water supply, which is particularly important in
paddy production. Bhache’s colder climate, along with its bari, or upland rainfed fields, limits the paddy varieties that grow well in this area.

Both ward one and ward five benefit from two to three cropping seasons in one year. Typical rotations in Ghanpokhara involve maize; kodo (finger millet); paddy; and potato. Kodo and maize are often intercropped and there is overlap between the kodo an paddy season. Additional crops such as mustard seed and wheat are also grown. Soy, frequently used in dal or as a snack, is grown along the raised barriers between paddy fields.

Typical cropping patterns in Roplephant and Bhache resemble each other, but differ slightly due to climate and irrigation differences. In lower, more temperate Roplephant, farmers plant maize in Magh (January/February) and harvest it in early Ashad (mid-June). Paddy nursery beds are seeded in Baisakh or Jestha (May) and transplanted after the maize harvest in mid Ashad (late June). Depending on the location and rice variety, paddy harvest throughout Nepal’s hills generally takes place late September through November.

In Bhache, where climate and irrigation make kodo easier to grow than paddy, maize and kodo are often interplanted. The kodo nursery bed will be set the in the first half of Baisakh (end of April) and then transplanted in mid Jestha (end of May). Maize is harvested in Bhadra (July), but the kodo continues to grow for another two months. At this altitude rice is planted earlier so that it may be harvested earlier before it gets cold. The paddy nursery bed is set in mid-late Baisakh (early May) and then planted in the fields the first week of Jestha (mid-May). Once paddy and kodo are harvested, threshed, and put away, fields can be made ready for potato planting. These patterns represent the
general cropping pattern for staple crops. Other crops are planted in smaller amounts and often in fields closer to home.

The agricultural system in Ghanpokhara relies on organic inputs. It is a labor intensive system with no mechanical assistance. Men use male buffalo to plough the fields. Men also raise the borders around the fields. Women are responsible for almost every other aspect of agricultural production. Buffalo dung is used to fertilize the fields. Most farmers save rice, kodo, maize seeds from year to year and will trade with neighbors if they want to vary what variety they grow. Vegetable seeds (tomato, spinach, eggplant, etc.) however are often purchased from the town of Khudi Bazaar or traded for with neighbors.

Despite Ghanpokhara’s ideal climate for growing many crops, this system (and its focus on paddy production) remains one of subsistence. Farmers pride themselves in being able to feed their households. Feeding themselves with food that they grow is a priority.

**Land Tenure & Sharecropping**

As outmigration rates continue to rise throughout Nepal (Ministry of Labor, 2014), agricultural systems rely more and more on tenant farm labor. According to the Ministry of Labor and Employment [MOLE] (2014), between the period of 2008/2009 and 2013/2014, the government increased the percent of labor permits it issued by 137 percent. Of the 521,878 labor migrants who obtained permits in 2013/2014, them were men. Almost 80% of the labor permits were issued through a recruitment agency (MOLE, 2014). The high rate of agency use is important to this study as I examine degrees of wealth and who has access to the resources that afford outmigration.
The high rates of outmigration are felt throughout Nepal, and are particularly intense in the agricultural sector. In Ghanpokhara (as likely elsewhere in Nepal) the use of the traditional sharecropping system of land tenure is helping to fill the labor gap caused by outmigration. The system of land tenancy in Ghanpokhara VDC is a traditional sharecropping system in which the harvest is split 50-50 between the landowner and the tenant sharecropper. While other systems of land tenure exist, this one is by far the most common in Ghanpokhara and the only arrangement used by study participants. In this sharecropping system, the landowner provides the land for paddy growing, supplies the rice seed, and pays the property taxes. The landowner should also supply the buffalo manure for the land. Tenant sharecroppers provide all labor involved in planting, growing, and harvesting the paddy. Rice seed for successive plantings is generally removed from the harvest before the yield is divided in half between the owner and tenant. If tenants wish to grow crops other than rice during different cropping seasons, they generally may do so and keep that entire harvest, but often must also supply fertilizer (buffalo dung) to do this.

Because rice is a fundamental part of the diet in Ghanpokhara, access to productive paddy fields increases household food security. Having enough rice on the dinner plate is more important than any accompanying food.

**Rice in Nepal**

Many aspects about Nepalese life reflect the importance of rice to their culture and diet. To celebrate a baby’s transition from milk to food, a rice eating ceremony is held on an auspicious day when infants are five or six months old. The traditional meal in much of Nepal, dal bhat, is a large plate of rice (bhat) accompanied by dal (a legume-
based soup), served with cooked greens, a small amount of vegetable curry, and a dollop of spicy sauce. Nepalese eat two meals a day, the first generally around 9 or 10 am and the second around 8 or 9 pm. Dal bhat is the de facto meal in most Nepali homes. On the 15th of Ashad (June 29), people throughout Nepal celebrate Ropain, National Paddy Day. For this festival people eat dahi-chiura—yoghurt (dahi) and beaten rice (chiura), plant rice, and play in wet, muddy paddy fields.

Hill people, usually Dalit or other individuals without access to enough rice, often eat kodo. The dark color of this food and its status as a low-class staple often lead to discriminatory remarks that the food is impure, as are those who regularly consume it instead of white rice. As Dalit and others improve their social standing and find greater traction in equality movements, they are slowly able to demand white rice instead of the kodo when working others’ fields.

The Nepali language also reflects the importance of rice. Where English language has paddy and rice, the Nepali language distinguishes rice at different stages. Dhan refers to the rice plant and paddy (unhulled rice), chamal is the uncooked, milled rice, and bhat is cooked rice.

Social Structure

Janajati (ethnic groups), Dalit, and women have been marginalized extensively at the political, economic, and socio-cultural levels. Nepal policies striving for inclusion often explicitly encourage the inclusion of these groups into programs and development opportunities. However, the overt discrimination and exclusion to which Dalit have been subjected highlights that degrees of marginalization matter. Two groups, Gurung janajati, an ethnic group of Tibeto-Burman descent that lives mostly around the Annapurna
mountains, and Dalit, a caste of Indo-Aryan (Pahari) descent that live in most regions of Nepal, comprise the majority of the farmers living and working in the two village wards of this study. This section on social structure gives a brief overview of the caste system in Nepal and then goes into more detail regarding Dalit and Gurung specifically.

**Caste and Ethnicity**

The Muluki Ain (National Legal Code), one of the first written laws of Nepal, dating from 1854, not only recognized casteism, but also legalized this form of discrimination. The code divided society into five major groups, ranging from sacred thread wearing, to enslavable alcohol consuming, to un enslavable alcohol consuming, to impure but touchable (foreigners, Muslims, Christians), to impure and untouchable. Based on a Hindu caste system, the Muluki Ain divided society into castes and placed Nepal’s indigenous ethnic groups, janajati, into these castes. Table 3 below indicates this Hindu caste hierarchy and the placement of some of Nepal’s janajati into this stratification system.

Although codified caste-based discrimination no longer exists, untouchability, occupation-based discrimination, and other forms of social, economic, and political discrimination persist (Department for International Development [DFID] and World Bank, 2006). Caste-based discrimination is more entrenched in Nepal’s less developed rural areas (Bennett, Dahal, and Govindasamy, 2008). Nepal continues to submit reports to the UN High Commission on Human Rights regarding its progress enacting the Caste-Based Discrimination and Untouchability Act of 2011. This law provides for basic human rights and dignity by making untouchability and discrimination on “the ground of caste, race, descent, community or occupation in the name of custom, tradition, religion,
culture, ritual or any other name” illegal, makes these offenses punishable, and makes restitution to the victims possible (Caste Based Discrimination and Untouchability (Offence and Punishment) Act, 2068 (2011)).

### Table 3  Muluki Ain Caste Hierarchy

<table>
<thead>
<tr>
<th>Hierarchy</th>
<th>Habitat</th>
<th>Belief/religion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A) WATER ACCEPTABLE (PURE)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Wearers of the sacred thread/tagadhari</td>
<td>Hills</td>
<td>Hinduism</td>
</tr>
<tr>
<td>&quot;Upper caste&quot; Brahmins and Chhetris (Parbatiya)</td>
<td>Tarai</td>
<td>Hinduism</td>
</tr>
<tr>
<td>&quot;Upper caste&quot; (Madhesi)</td>
<td>Kathmandu Valley</td>
<td>Hinduism</td>
</tr>
<tr>
<td>&quot;Upper caste&quot; (Newar)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Matwali Alcohol drinkers (non-enslavable)</td>
<td>Hills</td>
<td>Tribal/Shamanism</td>
</tr>
<tr>
<td>Gurung, Magar, Sunuwar, Thakali, Rai, Limbu Newar</td>
<td>Kathmandu Valley</td>
<td>Hinduism</td>
</tr>
<tr>
<td>3. Matwali Alcohol drinkers (enslavable)</td>
<td>Mountain/Hills</td>
<td>Buddhism</td>
</tr>
<tr>
<td>Bote (including Tamang)</td>
<td>Hills</td>
<td>Buddhism</td>
</tr>
<tr>
<td>Chepang, Gharti, Hayu Kumal, Tharu</td>
<td>Inner Tarai</td>
<td>Animism</td>
</tr>
<tr>
<td><strong>B) WATER UN-ACCEPTABLE/ Pani Nachaine (IMPURE)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Touchable</td>
<td>Kathmandu Valley</td>
<td>Hinduism</td>
</tr>
<tr>
<td>Dhobi, Kayai, Kusale, Kulu Musalman</td>
<td>Tarai</td>
<td>Islam</td>
</tr>
<tr>
<td>Miechha (foreigner)</td>
<td>Europe</td>
<td>Christianity, etc.</td>
</tr>
<tr>
<td>5. Untouchable (achut)</td>
<td>Hill</td>
<td>Hinduism</td>
</tr>
<tr>
<td>Badi, Damai, Gaine, Kadara, Kami, Sarki (Parbatiya)</td>
<td>Kathmandu Valley</td>
<td>Hinduism</td>
</tr>
<tr>
<td>Chyame, Pode (Newar)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Bennett, Dahal, and Govindasamy, 2008 (adapted from Gurung, 2003).

Of all the castes in Nepal, Dalit suffer the most from discrimination and untouchability. While Gurung don’t have the same advantages and opportunities as Brahmin or Chhetri castes, they don’t experience untouchability discrimination. Within Nepal’s caste system, Dalit are a caste (of Hindu-Aryan ethnic decent), while Gurung are an indigenous Nepali ethnic group that has been placed into Nepal’s Hindu caste system (at the unenslavable alcohol drinking caste). The Gurung are not a caste per se, but rather were placed into the caste hierarchy.

Despite officially abolishing caste-based discrimination, Nepali surnames continue to indicate a person’s ethnicity or caste. In Ghanpokhara VDC where this study occurred, the two most common surnames were Gurung and Bishwokarma, (often
abbreviated BK). Bishwokarma indicates Kami caste, which is one of many Dalit castes. It indicates the person bearing the name would traditionally be a blacksmith by profession.

**Dalit**

Dalits, a group of castes that has been historically considered Nepal’s “impure and untouchable” castes, suffer from assigned occupations such as blacksmiths, butchers, removers of cadavers and waste, and have been historically forbidden from touching or sharing liquids (water, milk, etc.) with “pure” castes. These “untouchable” castes now refer to themselves as “Dalit”, a term that means oppressed, broken, or crushed (DFID and World Bank, 2006).

Dalit are “those communities who, by virtue of atrocities of caste based discrimination and untouchability, are [...] deprived of human dignity and social justice (Proposed Bill, National Dalit Commission-NDC)” (Dalit Civil Society, 2015, p. 6). Dalit arguably make up anywhere from 13 to 20% of Nepal’s population (Dalit Welfare, n.d.; Library of Congress, 2011). Despite being a large percentage of Nepal’s population, Dalit suffer from large rates of landless or near-landless status. While the national average of landless people is 24%, for Dalits that percentage is 90% (Dalit Welfare, n.d.). Dalit live throughout Nepal, but make up a greater percentage of the population in certain districts. In this paper I refer to Dalit not as a caste, but rather as a community. Referencing Dalit as a low caste perpetuates and reinforces the notion of “caste” as a unit of classification and hierarchy.
Gurung

While Gurung are an indigenous ethnic group of Tibeto-Burman descent, the Muluki Ain caste stratification system, places them into the non-enslavable alcohol drinking caste group. This placement gives them significantly higher standing than Dalit in their ability to work and interact with other castes—both within their local communities and at the national level.

The majority of Gurung lives in the foothills of the Annapurna mountain range in Nepal’s Western District Development Region (provisionally known as Province Number 4 under Nepal’s new 2015 constitution), and speaks various dialects of the Gurung language. While Nepali is now the language taught in schools throughout Nepal, Gurung households continue to speak their mother tongue in the home. While making up only 2% of Nepal’s population, the Gurung are Nepal’s 11th most common caste/ethnic group (CBS, 2014b).

Intra-species Crop Diversity and Nepal’s Rice Diversity

Rice provides substantial calories for those living in many parts of the world. According to the International Rice Research Institute (IRRI), almost half of the world’s population depends on rice as a staple food, with Asians consuming most of the world’s rice production (Mohanty, 2013). However, since the Green Revolution, the genetic base of rice has been narrowing, with many high-yielding varieties (HYV) having been bred (unknowingly) using the same gene for short plants (Chang, 1984). Genetic uniformity threatens the ability of rice—and other crops—to withstand disease and pest outbreaks (Chang, 1984). The diversity of rice germplasm that has been collected and stored in ex situ centers provides an invaluable resource to breeders, farmers, and those who depend
on rice for their diets (Chang, 1984). However, rice grown by subsistence farmers in often marginal conditions could benefit from increased yields (Chang, 1984). The genes for this development would likely come from a diversity of germplasm. Germplasm collection centers remain important repositories for safeguarding crop genetic diversity, however in situ conservation efforts enable farmers to continue evolving and adapting rice germplasm under natural environmental conditions and stresses. Altieri et al. (1987) found that Genetic conservation programs are more effective in ecosystems in which resources occur naturally, but maintaining these resources can prove challenging. Conservation efforts cannot succeed if isolated from local cultures. (Altieri, Anderson, and Merrick, 1987).

Other studies have demonstrated why farmers grow various crop varieties simultaneously (Cleveland and Murray, 1997; Nazarea, 2006; Sthapit, et al. 2008; Zimmerer, 1992). The genetic diversity associated with intra-species diversity enables a species or population to better adapt to changing environments (Sthapit et al., 2008, Shand, H., 1997). Researches acknowledge the importance of maintaining traditional intra-species crop diversity on the farm for its potential to provide germplasm for the development of drought, heat, cold, or salinity resistant varieties (Shand, H., 1997; Committee, 1993). Crop genetic diversity plays an important role in confronting climate change (Ortiz, R., 2011). Increasingly, industrialized agricultural systems squeeze out intra-species crop diversity with fewer and more uniform varieties, threatening on-farm crop genetic resources and our ability to use these diverse genes in response to environmental change and for their social and cultural value.
In order to craft a more complete understanding of agrobiodiversity conservation, the discourse must focus on the role of marginalized subsistence farmers. All members of a community play a role in on-farm conservation, however the farmers playing a central role in seed distribution tend to have a wealthier economic status (Subedi et al., 2003). In Nepal, landownership empowers marginalized farmers such as women and the Dalit caste with greater household decision-making (Allendorf, 2007). However, these groups have relatively little access to land ownership in Nepal’s hinterlands. As more men migrate off-farm (Rao, 2006), the increased farming participation of both women and Dalits plays an increasing role. Conservation and development-oriented programs often direct their efforts towards existing systems of land ownership, reinforcing the inherent inequality of these systems (Chombaa, et al., 2016).

Rice plays a fundamental role in both Nepali culture and its food system. While the cultural and ecological significance that rice has played throughout Nepal’s history continues, it is threatened by rural flight, changing patterns in land tenure, and the increased use of modern rice varieties. Not only do farmers in Nepal currently grow hundreds of varieties of rice, but wild rice relatives also exist throughout the country. Both Nepal’s cultures and its economy depend on paddy and rice. In 2012/2013, farmers grew rice on 46% of Nepal’s cultivated land—nearly 1.5 million hectares producing 4.5 tons. During the same period, agriculture accounted for 34.38% of Nepal’s GDP. The percent of local rice varieties grown in Nepal varies between its three ecozones; in 2012/2013 the Terai grew (plains) 5.04%, the mid-hills grew 13.68%, and the mountain region grew 7.84%. (Agribusiness, 2013). In 2001/2002—while the country was still in the midst of the Maoist revolution—farmers planted 25.3% of rice using improved seed
(CBS, 2003). By 2012/2013 the use of improved rice seed had risen to 92.44% (Agribusiness, 2013). Increased agricultural aid and expanded access to improved seed, has meant a steady decline in traditional rice varieties. This decline threatens the valuable agroecosystem services provided by Nepal’s genetic rice diversity as well as the already precarious food security of the subsistence farmers growing rice in Nepal’s agro-ecozones.
CHAPTER 4. METHODOLOGY

This study uses data I collected over 9 months while living in Nepal from August 2014 through the end of May 2015. The research question asked, “How and why do land tenure and caste affect rice diversity in Ghanpokhara VDC?” I used a case study approach to research rice diversity in two villages, Bhache (Ward 1) and Roplephant (Ward 5), within Ghanpokhara. The two villages I selected in Lamjung provided a research site with a strong presence of rice diversity as well as significant ecological and social differences that could offer a point of comparison in the maintenance and conservation of the area’s rice diversity. This chapter explains the decisions and methodologies involved in this study.

Pre-field Work Decisions

I approached this research project prepared to study the barriers to crop diversity in the marketplace. I initially went into the study asking: Why doesn’t rice diversity make it to the marketplace? The motivation to find a way to empower subsistence farmers in the crop conservation effort through the valuation of their rice varieties in the marketplace compelled me to examine the value chain of rice diversity in Ghanpokhara VDC. However, after my first two trips to Lamjung, it became clear that subsistence farming system itself meant that there was no value chain to investigate. Additionally, the roles of land tenure and caste/ethnicity, which I had not prepared myself for going into this study, jumped out as highly important elements of this research narrative. While not entirely ready to give up on the idea of market potential for traditional rice varieties of Nepal, I decided that my research must include land tenure and caste as variables. I shifted my efforts and focus in this regard. I continued focusing on the hypothetical value
chain, interviewing millers, wholesalers, restaurants, and shopkeepers. While these individuals had valuable information to share regarding the availability, use, and underrepresentation of local rice in the market place, their stories also revealed valuable information regarding male outmigration, land tenure, and the subtle ways that degrees of wealth impact the paddy farming system in this region. Because of these initial findings while in the field, I changed my study to focus on land tenure and how caste maps onto systems of land tenure. This change resulted in the current research question: How and why do land tenure and caste affect rice diversity in Ghanpokhara?

**Bhache and Roplephant: A Two-Case Study of Rice Diversity**

This study uses a case study methodology to research the paddy production system in two villages of Ghanpokhara. As Yin (2009) writes, case studies can be an ideal way to “understand complex social phenomena” (4). Yin further notes that case studies are forms of empirical enquiry that are particularly useful for examining “contemporary phenomena in depth and within its real-world context [...] when the boundaries between phenomenon and context are not clearly evident” (18). Using this method of enquiry has allowed me to examine the dynamic landscape of Ghanpokhara and the complex factors contributing and detracting from rice diversity within the paddy production system.

To better understand how and why farmers continue to grow diverse landraces in Nepal’s mid-hills, I selected two villages, Roplephant and Bhache, in the district of Lamjung. Selecting two villages as unique cases within Ghanpokhara helped ensure the validity of the study by offering an opportunity to not only examine and compare location-based differences, but also to craft a more complete understanding of social
dynamics of different places. The complex subsistence agricultural system of this region provides a rich background in which to examine rice diversity and changing patterns of paddy production. Data collection took place from September 2014-May 2015.

I selected the villages of Bhache (Ward 1) and Roplephant (Wards 5) in Ghanpokhara for this study based on their reputation for traditional rice varieties, the relative accessibility of the villages, and differences in their ethnic and caste makeup. While it can take up to a full day and a half from Kathmandu to reach Bhache and Roplephant, these villages provided an ideal location to examine dynamics of caste, land tenure, and gender in a paddy farming system rich with diversity. The villages’ proximity to each other meant that differences such as demographics, land tenure, ecology, and access could be more validly compared.

Ward 1 (Bhache) has a total of 523 inhabitants (260 female, 263 male) in 110 households. Ward 5 (Roplephant) has a total of 302 inhabitants (155 female, 147 male) in 71 households. (CBS, 2011a). From the villages, the nearest market centers are Khudi and Besisahar, a one to two hour walk downhill to Khudi, and an additional one hour bus ride from Khudi to Besisahar. There is no public transportation between the two villages, and very few residents have motorized transportation. Seasonal monsoon landslides frequently destroy the dirt road running between Bhache and Roplephant. Residents in both villages have a long way to travel by foot to access services such as retail food supplies, agricultural extension or supplies, healthcare, police, or banks.

I indicate distance and time travel from Kathmandu, Nepal’s capital, to provide readers of this thesis an understanding of transportation to and from Bhache and Roplephant. Despite their relative accessibility compared to other, more remote regions and villages of Nepal, it still takes a full day of travel by multiple modes of transport to reach the capital.
Data Collection

To ensure a rigorous case study, I used multiple forms of data collection for this study. The use of census data, agricultural programming documents, participant observation, and semi-structured interviews (both within the case sites as well as with stakeholders in Nepal’s agricultural development located outside the case sites) all contributed to the understanding of rice diversity conservation in Ghanpokhara VDC and how and why systems of land tenure and caste affect rice diversity. The data collection approaches I used for the study will be elucidated further in the following sections of this chapter. By collecting and analyzing multiple forms of data, I was able to better understand the greater context of the complex agricultural systems found in the remote regions of Lamjung District such as Ghanpokhara. Additionally, the use of diverse data sources provided perspective from multiple angles of agricultural development programming.

During my nine months in Nepal, I lived in Pokhara for four months and Kathmandu for five months. I made four trips to Lamjung and Ghanpokhara. My time in Kathmandu and Pokhara allowed me to meet with development agencies and NGOs involved in the agriculture and development sectors, conduct initial analysis of my findings, and also afforded me the opportunity to seek out references and talk over ideas with others researching in Nepal. This time away from the field provided a critical space away from the field in which I reflected, determined next steps, procured research

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Iowa State University granted Institutional Review Board approval for this research; the approval memo is included as Appendix 4.
perms needed for researching within the Annapurna Conservation Area Project, and accessed technological resources.

Throughout both data collection and analysis, an inductive approach was used to elicit a new understanding of the data without imposing prior assumptions or hypothesis. An inductive approach ensured that I remained “open to what the site [had] to say rather than [...] force-fit the data into preexisting codes” (Miles, Huberman, & Saldaña, 2014, p. 81). Using an inductive strategy allowed new findings to emerge and shift as I immersed myself deeper into the data. This research began as an investigation into the barriers bringing rice diversity to the marketplace, the inductive approach of the study opened my data collection and analysis to the emergent themes of land tenure and caste.

Data collection involved the use of semi-structured interviews, household surveys, participant observation, and available census data. The diversity of data collected helped provide a comprehensive story of the paddy farming system in Ghanpokhara. There were several steps involved in the field-level data collection of surveys and farmer interviews.

The first step was an initial field assessment to determine the suitability of the location. During this initial assessment, I visited many villages in Ghanpokhara and spoke to residents and local leaders to determine the appropriate size and scale of the project. I also gathered information regarding local rice diversity, social characteristics of the villages, and basic ecological and geographical traits. Once this initial field assessment was complete, I selected Bhache and Roplephant as the two villages of focus. Their different demographic profiles, distinct environments, and their differences in rice landraces provided excellent comparative cases for this study. With this initial step
completed, I returned to Pokhara to focused on refining my survey instrument, finding a research assistant, and talking with experts on Nepal’s paddy production and rice diversity.

On my next three trips to Lamjung, I brought a research assistant with me to act as my translator and to help navigate issues of cultural sensitivity. Due to timing and other commitments, I had a different assistant with me for each visit. With different experiences and backgrounds, these three assistants contributed unique interviewing styles and the responses I received from participants in each trip reflected their different approaches to interviewing.

As there are no hotels in Bhache or Roplephant, we stayed with Gurung farmers in both villages. The homes we stayed in had electricity and running water outside, but no Internet connection and only limited cell phone service. Over the course of these three trips we conducted approximately 70 interviews in Lamjung and collected 46 household surveys from farmers in wards one and five of Ghanpokhara.

The case study approach allowed me to focus on questions of rice diversity and food security in the context of Ghanpokhara’s evolving systems of paddy farming and land tenure. I used household surveys, semi-structured interviews, and ethnographic observation in order to craft a complete picture of the complex socio-agricultural landscape of Ghanpokhara’s Wards 1 & 5. I also used semi-structured interviews with service providers, wholesalers, restaurants and shops in Khudi and Besisahar as well as national census data and other secondary sources such as civil rights reports to triangulate the perspectives of Ghanpokhara’s farmers. Corrine Glesne (2011) claims that triangulation can be an invaluable tool in qualitative research as a means to ensure
validity. I based the results of this study primarily on the analysis of semi-structured interviews and household surveys.

**Census Data**

This study used both population and agricultural census data to gather information about characteristics of Lamjung and Ghanpokhara pertaining to demographic information, paddy production, the use of local and improved rice varieties. Nepal’s Central Bureau of Statistics (CBS) does an excellent job of collecting and presenting data from large, diverse sets of indicators. While data at the ward level for Bhache and Roplephant proved difficult to find, CBS provided invaluable information on population traits that has been used throughout this research to confirm observations made while in the field.

**Household Surveys**

I used household surveys to gather information about respondents regarding their caste, household size, educational attainment, literacy levels, landholding size, and quantity of land in local and improved rice varieties as well as in finger millet. Literacy and educational information was only collected regarding the principal informant. Household-level information pertained to farm-level data.

I designed the survey format and participant demographic information based on the Women’s Empowerment in Agriculture Index (WEAI) (Alkire et al., 2013). The WEAI index is a survey-based index that measures the empowerment and agency of women in the agricultural sector. I used the WEAI as a foundation for my survey because of its comprehensive assessment of household level demographic information measuring educational attainment, and language facility, and ethnic information. I modified the
portions of the survey to better fit both my study needs regarding land tenancy and the specific research location in Nepal’s mid-hills. The caste/ethnicity portions were modified and I added landholding information. The general format of the WEAI survey worked well for this study.

The survey questions were close-ended and intended to gather specific information as a point of reference for comparison. My research assistant read and filled out the household surveys according to the participants’ responses. Often times participants were unsure of their exact age or their landholding size and would consult those around them. While the initial survey did not include information about out-migration of household members and remittance income, I later edited the survey to collect this data.

Due to the fact that land tenure and caste were not originally anticipated as key aspects of the study, the household surveys provided inconsistent information regarding land tenancy at the household level. Completed surveys did not adequately reflect the size of land parcels divided between tenancy and ownership. Determining whether landowners included all of their owned land in their total amount of land or just the land they currently farmed was difficult to determine. This is due to the study’s initial uncertainty regarding the role of land tenure and the various types of land access that the subsistence farmers of this region encounter. Further research should be conducted to better understand how the precise sizes of paddy field access differ between land ownership and sharecropping.
Semi-Structured Interviews

Semi-structured interviews were conducted to give voice to the subsistence farmers and other stakeholders in Ghanpokhara VDC’s rice diversity. In order to better understand the dynamics of Ghanpokhara’s agricultural landscapes, these interviews asked farmers to share their views and insight regarding their perceptions of rice diversity, agricultural support networks, and farming dynamics unique to their own experiences. Follow-up interviews took place with select key informants for clarification and understanding.

In the case of Dalit participants in particular, the interview is the most appropriate way for them to adequately share their opinions and be given a voice to their concerns, and the participants of this study explicitly confirmed this reasoning. Over and over again throughout interviews, Dalit participants voiced their appreciation that I had come to them to hear their what they had to say. Their systematic exclusion from many aspects of society, particularly in the hinterlands, make it all the more important to listen to their voices and share their perspectives.

Interview protocol varied depending on whether the participant was a farmer, miller, shopkeeper, or service provider. Initial interviews were audio recorded, however due to participant hesitation my research assistant and I transitioned into simultaneous translation and note taking with no recordings. Farmer interviews generally took place on the participant’s front porch. They occasionally took place at the location where I stayed or while the respondent worked outside at a task such as mat weaving. I asked local leaders questions relating to the demographics, development, and social dynamics of the
wards. These interviews took place on their front porches or at one of the places where I stayed.

The interviews with government representatives and NGOs involved in the agricultural sector were used to gauge outreach and opportunities for farmers as well as to assess programmatic gaps, overlaps, and inter-organizational collaboration. These interviews generally took place in their offices, although occasionally they took place sitting outside or in a teashop. Because transportation and communication were often difficult, interviews with ACAP officials required walking several hours without knowing whether the individuals with whom I desired to speak would be available. Other interviews depended upon pure chance of running into representatives in unexpected locations such as catching a bus in Khudi or at the office of another participant in Besisahar.

**Sample Selection**

I conducted semi-structured interviews with individuals along a hypothetical rice value chain. The interviews conducted in in Ghanpokhara contribute to the bulk of this study’s findings. Interviews conducted beyond Ghanpokhara (such as with development agencies in Besisahar) serve primarily for triangulation and verification purposes in this study. In Ghanpokhara I interviewed farmers, two millers, and local village leaders. All of those I interviewed on their farming perspectives also completed a household survey. The household survey served to gather quantifiable data that I would not get from the interviews. The surveys contributed a comparable layer that allowed me to distinguish between caste/ethnicity, land holding status, and literacy level.
Study participants were initially selected using purposeful sampling techniques. I strove for an equal number of participants from wards one and five. The average age of participants was 48 years old, with participants in Roplephant (ward five) averaging 50 years old, and those in Bhache (ward one) averaging 46. The gender and age breakdown of the participants reflects who was present at home when we stopped by to talk. Males were often plowing in the fields or not living with the household, and younger members tended to either differ to the authority of older household members or to not be present at the time of the interview.

After initial analysis from the second field visit revealed close ties between land tenure status and caste, I used theoretical sampling to gain an even distribution among caste and ethnic groups (Glense, 2011). Theoretical sampling is defined as “the process of data collection whereby the researcher simultaneously collects, codes and analyses the data in order to decide what data to collect next” (Coyne, 1997). Based on the emerging themes of land tenure and caste, theoretical sampling allowed me to target participants based on their role in the land tenure system and to further elicit their views regarding land tenure arrangements.

**Study Participants in Ghanpokhara**

Table 4 (below) illustrates the participant breakdown by gender and location. Additionally, the breakdown of participants by caste and location reveals that twice as many Dalit participants lived in Bhache (13 of 19) than lived in Roplephant (6 of 19), while more than twice as many Gurung participants lived in Roplephant (15 of 22) compared to Bhache (6 of 22).
Table 4  Semi-Structured Interview Participants in Lamjung district

<table>
<thead>
<tr>
<th>Participants in Lamjung</th>
<th>Total</th>
<th>Female</th>
<th>Male</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>41</td>
<td>28</td>
<td>13</td>
</tr>
<tr>
<td>By Village</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhache</td>
<td>19</td>
<td>13</td>
<td>6</td>
</tr>
<tr>
<td>Roplephant</td>
<td>22</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td>By Caste/Ethnicity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gurung</td>
<td>21</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>Dalit</td>
<td>19</td>
<td>14</td>
<td>6</td>
</tr>
<tr>
<td>Brahmin</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Service Providers</td>
<td>11</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Shop Keepers &amp; Restaurants</td>
<td>11</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Millers &amp; Wholesalers</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

This breakdown of caste and ethnicity by location will be examined in the results, as it represents a key finding of the study. I had difficulty finding younger male participants so that their stories could be part of this research narrative.

Approximately 50% of households participated as tenant sharecroppers, 25% were landlords to sharecroppers, and 25% owned land with unclear tenancy status (either renting out or leasing from). Formal educational attainment was exceptionally poor among all respondents, as most could neither read nor write. Almost all Dalit participants
sharecropped to some extent, and most of them lived in the higher altitude village of Bhache.

**Data Analysis**

I conducted initial analysis of the interviews while in Nepal using thematic coding, extracting broad themes such as “Tenancy”, “Quantity & Subsistence”, “Location”, “Agroecology”, and “Labor”. This initial coding sequence enabled me to refine the study and pursue the emergent themes of caste/ethnicity and land tenure.

Subsequent analysis that took place after my return from Nepal involved multi-cycle coding using NVivo software. First Cycle coding used descriptive coding labels along side the initial thematic codes and used them all in a simultaneous coding manner (Miles, Huberman, & Saldaña, 2014; Saldaña, 2013). Examples of these codes include “Relationships”, “Voice”, “Caste”, and “Ecological Problems” “Outmigration”. These codes are particularly “appropriate for social environments” such as exploring differences among caste and ethnicity. Evaluation coding was used on portions of the data to “assign judgments about the merit, worth, or significance of programs or policy.” (Miles, Huberman, & Saldaña, 2014, 76). Examples of these codes include “Trust”, “Group Participation”, and “Character”.

Second Cycle coding was used to condense the First Cycle codes into “Pattern codes” (Miles, Huberman, & Saldaña, 2014, 73). Examples of these Second Cycle pattern codes include “Supply”, “Price”, “Labor Shortage”, “Farming Problems”, and “Labor Difficulty”.

The inductive approach used in both data collection and analysis removed preconceived expectations from the research and provided an opportunity to hear the
farmers’ voices about the crucial role that sharecroppers now play in Ghanpokhara’s paddy production system and to understand the necessity of including them in rice conservation efforts.
CHAPTER 5. SOCIAL STRUCTURE, LOCATION, AND RICE DIVERSITY

This case study examines social differences of caste/ethnicity and landowner/sharecropper as mechanisms affecting the conservation of rice diversity in Ghanpokhara. Outmigration amplifies the social difference between classes by revealing that those farmers with more capital have family members migrating off farm while those with fewer means stay to farm the fields. The results in this chapter, based on interviews and household surveys conducted with farmers in the village wards of Bhache and Roplephant, provide valuable insight into the important role Dalit sharecroppers play in the paddy production system. In Bhache and Roplephant, caste and ethnicity often map onto a farmer’s status as landowner or sharecropper, with Gurung as landowners and Dalit as sharecroppers. In addition to this linked social hierarchy between caste/ethnicity and landowning/sharecropping, a locational disparity also persists between the two villages, with the Dalit sharecroppers living in more marginal, less productive paddy land and Gurung landowners living on the fertile toe slope. These social and biophysical differences combine to impact varietal maintenance and the continued in situ conservation of local rice varieties.

Location, social characteristics, and agroecological elements intersect in the management of Ghanpokhara’s rice diversity. The relationships between these aspects of the paddy production system reflect deep inequalities and injustices. Social dynamics at play in this system include caste and ethnic differences, degrees of economic wealth, levels of household food security, education levels, and rates of out-migration, among others. Agroecological elements at play within these two village wards include differences in soil, altitude, climate, labor availability, irrigation, and access to and
awareness of agricultural programs. These differences are embedded in the two different villages, indicating the importance of spatial difference in the context of the paddy production system. I use the voices of the subsistence farmers who participated in this study to express the degree to which location, agroecological conditions, and social differentiation play out in this paddy production system.

The variables mentioned above contribute to make Ghanpokhara’s paddy production system a complex and fluid one that reflects social and agroecological differences within the case study. Bhache’s and Roplephant’s social and agroecological dynamics reveal issues of exclusion, marginalization, and access to resources that affect not only rice conservation but also Nepal’s efforts to craft inclusive development policies and programs. Institutional development gaps will be addressed in the next chapter.

This results section breaks down findings along three dominant themes that emerged from the data. The overarching finding is that the prevalence of sharecropping in Bhache and Roplephant is responsible for the continued cultivation of certain rice landraces that are productive in the ecosystems in which they grow, but other culturally significant landraces are threatened by their lower yields and the need of sharecropping families to produce more rice to feed their large families. This study also found that caste and ethnicity map onto the land tenure status of farmers in the wards of Roplephant and Bhache. Results are broken down into the following sections: 1.) Local rice diversity; 2.) Marginalization and exclusion in the context of spatial segregation and social structure; 3.) Sharecropping and land tenure arrangements linked to farm labor and household size; 4.) Differences in economic wealth and outmigration among the various populations. I integrate rice diversity into sections two and three in order to highlight the crucial role
that both location and social structure play in maintaining rice diversity. Figure 4 (below) reveals how these dynamics are interconnected and affect the region’s rice diversity. This image provides a visual framework representing the diverse elements affecting traditional landrace diversity in Bhache and Roplephant.

Figure 4   Key elements in the dynamic landscape affecting rice diversity in Lamjung’s Ghanpokhara VDC [diagram based on elements of successful irrigation systems identified by Beccar, Boelens, and Hoogendam (2002)]
Local Rice Diversity

Farmers in this study grew approximately 25 varieties of local and improved rice varieties. Most subsistence farmers in Ghanpokhara recognized the value of their local varieties and are quite proud of their tasty, organic agricultural system. They did not want the chemical fertilizers associated with improved varieties, and they very much valued the soil quality they associated with traditional buffalo fertilizer. Participants living in Bhache grew about 15 varieties, while farmers living in Roplephant grew 21 varieties. Farmers in Ghanpokhara stated that they grow different rice varieties for their unique traits and qualitative values. One Gurung farmer commented on the diversity of rice she grows and how different locations necessitate different varieties.

We mix Kalo Jhinuwa with Dalle because Dalle doesn’t taste that good, so we mix it with Jhinuwa. Chomron is smaller and finer; the grain of Tamare is red. By this side of the house, we grow Chhomrong, but by our house by the landslide Tamare grew well. Lower, Jhinuwa grows better. Anga grows between the two [elevations]. [...] [We grow so many varieties] because the lands are so scattered, some are low like Roplephant, and some are higher. That’s why they need to grow different varieties—because of the environment. We also grow Kumaltar and Pokhrelli.

-Bhache, April 17, 2015, Simultaneous translation by assistant

One of the most common characteristics of local rice varieties valued by farmers is a rice’s ability to keep the farmers’ bellies full for longer periods of time, allowing them to work longer hours in the fields without hunger pangs. As one Dalit farmer in Bhache noted, he likes local rice because, “It is tasty and I don’t get hungry again and again.” (December 12, 2014, Simultaneous translation by assistant). One Gurung farmer translated the ability to keep farmers full longer directly into the quantity of rice needed for his family: “Naule yields two mana (baskets of rice) when cooked and that’s enough

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8 See Appendix 1 and Appendix 2 for a list of rice varieties grown by respondents in this study and some of the rice characteristics.
for four family members. But Pokorelli when cooked we need four mana. Naule fills us up for the whole day. Pokorelli tastes good, but it doesn’t fill you up” (Roplephant, December 8, 2014, Simultaneous translation by assistant). Local varieties were also equated with better taste, “Local rice is more tasty than modern varieties, so we prefer local” (Dalit farmer, Roplephant, December 17, 2014, Simultaneous translation by assistant); “[These local varieties] are tasty also. They are more tasty than modern varieties” (Gurung farmer, Bhache, December 14, 2014, Simultaneous translation by assistant).

Because farmers also have animals to feed, they also prefer varieties that produce more fodder. “Local varieties have more grass for animals” (Gurung farmer, Roplephant, December 9, 2014 Simultaneous translation by assistant). The ability of local varieties to produce more fodder means that farmers spend less time in the forest collecting feed for their animals. Rice varieties also differ by location and have cultural and medicinal uses I explore below.

**Marginalization and Exclusion by Location and Social Structure**

Marginalization and exclusion touch on many aspects of life in rural Nepal. This study found that both women and Dalit suffer from marginalization in the paddy farming system and from exclusion from agricultural programs (the second of which will be discussed in the following chapter). In this context, spatial segregation means certain people own, live, and/or farm in different places, with different agroecological characteristics. This segregation manifests itself in multiple ways: Dalit farmers live near more marginal paddy productive land; the location of this marginal land is less accessible and thus also hinders residents’ access to financial, educational, agricultural, and other
resources. Spatial segregation is an important component in the paddy production system of Ghanpokhara as it presents a physical manifestation of the problems facing many subsistence farmers in the region. Spatial segregation across the landscape reflects not only social discrimination and stigmatization, but it also reflects inequality in the availability of agro-productive resources. Government sponsored District Agricultural Development extension programs and private-public Annapurna Conservation Area Project (ACAP) programs (such as the Women Farmers’ Vegetable Group in Roplephant) may include women and Dalit at the policy level, but in reality the participation of these groups is minimal or overshadowed by the participation of Gurung men. Additionally, government-sponsored programs target villages with greater access to transportation and amenities, meaning more remote villages receive fewer services.

**The Privilege of Location: Roplephant and Bhache**

In many villages throughout Nepal, spatial segregation relegates Dalit to housing clusters isolated from the principal village location. In Lamjung this segregation occurs in some, but not all villages. Roplephant and Bhache do not exhibit segregation within the villages themselves, however differences in agroecological conditions between these two villages and their respective wards reflect varying degrees of privilege and marginalization among the inhabitants of these places. Agroecological differences between the two wards include climate, topography, and rice landrace suitability.

Location plays a key role in the agroecological differences between these two wards and in which rice varieties can grow where. The lower ward centered around Roplephant (altitude approximately 3195 feet) has predominantly irrigated low-land paddy fields (khet), easier access to public services, and, most notably, flatter fields.
Roplephant’s name indicates the value of its location: phant means flat in Nepali, emphasizing the value and convenience of its topography in respect to other villages in the VDC. This flatness takes on greater meaning when compared to fields on steeper slopes. The village of Roplephant is composed of predominantly Gurung households. It also contains a small number of Dalit sharecropping households, some of who live in Roplephant only during the paddy growing season. The temperate climate and irrigated khet make Roplephant particularly suitable for paddy growing as well as for other agricultural endeavors.

I see a lot of potential here like goat farming, honey bee farming, medicinal plants, coffee, fruits etc. You can grow anything here. The altitude is good, there are roads, electricity. Kathmandu and Chitwan [in the Terai] are closer from here than from Pokhara.
-Gurung farmer, December 8, 2014, Roplephant, Direct translation from audio

Its location alongside a gently sloped road make it an easy 30 minute walk to public transportation and the heavily touristed Annapurna hiking circuit. Farmers rarely complained about challenges to paddy farming in this village.

A one-hour walk uphill from Roplephant is the village of Bhache (altitude approximately 5054 feet). While the distance between Roplephant and Bhache is less than one and a half miles, the altitude difference between the two is nearly 2000 feet. This difference has agroecological significance. As one farmer pointed out, ecological differences between the two villages are evident: “Talking with farmers in Roplephant and here in Bhache [about rice], you can get different opinions because of the landscape differences. Here it is not flat. And it’s cold.” (Gurung farmer, December 14, 2014, Bhache, Simultaneous translation by assistant). An agricultural service provider who had recently moved to Bhache summed up farming here: “This place is remote. Nothing is
easy here. Everything is difficult. The land is steep here. There are forests everywhere
which cast shade on the farms. There is no drinking water, no irrigation. There are only
difficulties” (December 11, 2014, Direct translation from audio). Farmers in Bhache
frequently mentioned a number of agricultural challenges, including the prevalence of
rain-fed, upland bari with limited irrigation, frequent landslides, high rates of soil erosion,
compacted soils, and a cold climate.

Growing rice is very difficult here because it is very steep. The soil is very hard
and not soft. It is more difficult here than in other places that have softer and
better fields.
-Dalit farmer, Bhache, December 12, 2014, Simultaneous translation by assistant

Our main challenge is to get irrigation. Most of the time when we use canal water,
the paths are always in danger of a landslide. Otherwise there aren’t many
problems. We have to always maintain hoses to prevent leakage against
landslides. We have experienced a lot of landslides in the rainy season, but it’s not
that bad...we can fix it.
-Dalit farmer, Bhache, April 16, 2015, Simultaneous translation by assistant

The difficult problem is irrigation. It is difficult to get water to the paddy fields.
[...] The water is rain water, so if there isn’t rain water there won’t be water in the
canal. Finger millet doesn’t need as much water but if it rains a lot at finger millet
planting the yield won’t be good, and vice versa for paddy.
-Gurung farmer, Bhache, April 16, 2015, Simultaneous translation by assistant

Bhache’s soil and climate may be more suitable for growing finger millet (kodo)
than paddy. Most kodo now goes to make raksi, a fermented alcohol that plays an
important role in celebrations and festivals in this Gurung-dominated culture. Older
residents of Bhache spoke of an affinity for eating finger millet in the form of dhido (a
thick porridge paste), especially in the winter months. However younger residents no
longer care much for kodo, and it carries a stigmatization as a food for those who can’t
grow or afford enough rice. The gravitation towards increased rice consumption and
production in Bhache likely means that more fields which once grew kodo are now put
into paddy. Despite the suitability of Bhache for finger millet, farmers have adapted rice varieties that can grow at this altitude.

The frequency of seasonal landslides makes the dirt road from Roplephant to Bhache (and on higher to Nayung) frequently impassable. While transportation is limited regardless of the road condition, and most farmers walk to lower altitudes regardless of the road condition, spotty seasonal access means that that tractors from Khudi can’t make deliveries of purchased rice bags. This leaves those in need of rice provisioning to take roughly three hours to walk to Khudi and back to purchase rice for their families, carrying 40 kg bags of rice home in baskets on their backs. One Gurung woman living lower in Roplephant remarked on the need of Bhache residents to purchase and carry rice, “During Fagun-Chaitra (March) you can see many people carrying bags of rice. People who live up in the hills don’t have enough rice, so they have to carry rice up there” (Gurung farmer, December 9, 2014, Roplephant, Direct translation from audio).

The climate, soil, and irrigation in Bhache make paddy farming more challenging. These traits also mean that the rice varieties that grow here have lower yields than the varieties that grow in Roplephant. These factors compel many Bhache households to cultivate fields at lower altitudes, often as sharecroppers. The distance traveled for paddy farming was another comment frequently made by farmers in Bhache. Farmers there weigh tradeoffs when deciding where to farm:

I farm and tenant land both up here and lower. The production is better lower than up here. My own land is around here. There are irrigation problems in the upper land, but working by my house is easier than working in land that is lower.

-Dalit farmer, Bhache, April 17, 2015, Simultaneous translation by assistant

Social differences are also evident between Roplephant and Bhache. The social differences between Bhache and Roplephant reveal an important distinction between who
benefits from Roplephant’s location, and who lives in and works Bhache’s more marginal agricultural land. Unlike Roplephant’s predominantly Gurung population, approximately 50% of households in Bhache are Dalit, and 50% are Gurung. The fact that Bhache has such a large number of Dalit households while Roplephant has so few indicates that the population group with higher status not only owns the better land, but they also benefit from greater availability of resources and services.

Politically however, this difference means that in Bhache Dalit play a greater role in governance. Dalit operate the stores and the mill. Just as notably, Dalit also hold some government-sponsored positions. The Social Mobilizer for Ghanpokhara lives in Bhache. This position acts as a bridge between the community and the District Development Committee (DDC) (in Besisahar). The mobilizer identifies and organizes a group of the 30 most marginalized members of the VDC, most of whom he said are women and Dalit. He works with these individuals on awareness and voicing their problems. He will take their concerns to the DDC if they can’t solve problems on their own. He also works to get development funding through the DDC. In addition to the Social Mobilizer, the ward has five representatives, two of whom are Dalit, and one of whom must be a woman. One of the Dalit ward representatives also serves as the secretary for the Conservation Area Management Committee (CAMC) which regulates the community’s use of forest resources. This participation by Dalit at the community level is notably absent from life in Roplephant, reflecting both the lower numbers of Dalit residents in this location, as well as the exclusion of those that do live and/or farm there.
Gender Inequality

This study found that regardless of caste, women farmers continue to bear the burden of agriculture farm labor and continue to be excluded from agricultural programs—both in name as well as in practice. What this means is that the private-public agricultural development program in Ghanpokhara targeting women was in fact run by men. While mechanisms exist to reach out to women, and women do participate at the village level for social and service-oriented activities, agricultural development programs generally fail to use these existing mechanisms to target women farmers.

With the large outmigration of men, women often commented on the absence of men from farm work, and how this left them not only in charge of the labor but also responsible for farm-level decisions:

Yes, it is difficult farming but you can’t stop farming because it is difficult. Men usually do other work and it is all up to the women to manage everything. But you can’t stop. It is very difficult, especially during monsoon.
-Gurung woman farmer, December 9, 2014, Roplephant, Direct translation from audio

There are no men, and women don’t have much skill in farming. We have to satisfy ourselves.
-Dalit farmer, December 11, 2014, Bhache, Direct translation from audio

Usually it’s the women who are more involved. [Men] mostly work outside. I discuss [which rice varieties to plant] with the tenant farmer’s wife and then we ask for our husband’s suggestions on what we have decided. Women are more involved in farming matters.
-Gurung farmer, December 9, 2014, Roplephant, Direct translation from audio

Female participation and decision making at both the household and farm level indicates their importance in deciding what rice varieties to grow.

Throughout villages in Nepal, aama samuha (mothers’ groups) bring women together for activities and public service. Each of the nine wards in Ghanpokhara has an
aama samuha. These groups help maintain paths, organize village events, put on cultural shows, and advocate for village development and services. In Roplephant and Bhache they have small buildings that they own that can be rented out by other groups.

Caste level participation varies between mother’s groups of different wards. The aama samuha in both Roplephant and Bhache are dominated by Gurung women. One NGO worker from Kathmandu now living and working in Bhache commented,

In mother’s group Dalit are not directly involved but [only] through group activity. I think you have also noticed in yesterday’s program (a seed fair), in the (cultural dance) show, there is I think not so [much] participation of the Dalits. This is the main issue we have to address. [...]They are involved in the work, but while presenting or in the like post (leadership) in the committee they don’t have a distinct responsibility.
-Local NGO worker, Bhache, December 11, 2015, Transcribed from recorded interview conducted in English

The different levels of participation in the mother’s groups based on caste is significant given the increasing role of Dalit sharecroppers in Ghanpokhara.

Similar to Cameron’s (1998) findings that lower caste women have greater individual agency, in Ghanpokhara, Gurung and Dalit women both suffer from exclusion, but Dalit women have greater levels of agency and individual freedom within the home. On one level, the participation of men could read as sharing the work load. However, because men take over the leadership of this income-generating activity, I interpret this as stepping into work that is intended to give women greater independence. Gurung women remarked on their limited experience outside the home more frequently than Dalit women: “we [women] aren’t exposed to a lot of things, [therefor] we appreciate the men helping us” (Gurung farmer, Roplephant, February 21, 2015, Simultaneous translation by assistant).
While some development programs and finance opportunities in Lamjung District researched as part of this study did specifically target women, female participation in programs was limited by their individual degrees of agency. One organization, the Annapurna Conservation Area Project (ACAP), successfully managed to target women in policy. However, even with women as the specific target of support, their husbands dwarfed their participation. Women defer to men’s experience and exposure beyond the farm and rely on their affirmation of decisions. ACAP started a Roplephant Vegetable Group for women with women as the sole members. Yet the head of the vegetable growers group indicated that husbands actively participated in the meetings:

Q: Tell us about the vegetable group. The vegetable group started last year. It has all women members. The meetings take place here [at my home] and men come to meetings and are active, but women are the members and do the work. Because we [the women] aren’t exposed to a lot of things, we appreciate the men helping us.
Q: How do the men help? Both men and women work in the fields; the name of the group is for women but in the group both men and women work and attend the meetings. Only the women can be members, but both men and women participate. ACAP started it as a spin-off from the village mother’s group. ACAP said that it had to be a women’s group, but both men and women come.
Q: Do you like that the men participate in the group? Yes, all the husbands help the wives. We like that they participate—both at the meetings and in the fields.
-Gurung farmer, Roplephant, February 21, 2015, Simultaneous translation by assistant

In sum, women bear the brunt of the agricultural workload in both villages. When men are not present in the household, women take responsibility for decision making as well as laboring in the fields. When men are present in the household, the men make decisions. Men actively participate in and lead most political and agricultural development groups where they aren’t explicitly omitted (as with the aama samuha groups).
Dalit Inequality

While the codified caste system has been officially abolished in Nepal, Dalits continue to be subjected to extreme caste-based discrimination. This study found that Dalit farmers in Ghanpokhara suffer from double discrimination and exclusion based on their place in the caste system as well as their status as tenant farmers. The systemic exclusion and continued stigmatization of this group as untouchable impacts their participation at the household, landscape, education, economic, and political levels and affects the agricultural system of Ghanpokhara.

Both Dalit and Gurung suffer from marginalization. However, the degrees of their marginalization differ. Literacy levels, while low throughout Nepal, are one indicator that reflects marginalization differences within the study area. As Table 5 shows, while 48% of Gurung participants in this study could read and write, only 21% of Dalit respondents could both read and write. 47% of Dalit participants could neither read nor write, while 29% of Gurung respondents could neither read nor write.

Table 5  Level of reading and writing of primary respondents of household surveys by caste/ethnicity and by village ward

<table>
<thead>
<tr>
<th>Caste/Ethnicity</th>
<th>Can read and write</th>
<th>Can sign</th>
<th>No reading or writing</th>
<th>Total Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gurung</td>
<td>10</td>
<td>5</td>
<td>6</td>
<td>21</td>
</tr>
<tr>
<td>Dalit</td>
<td>4</td>
<td>6</td>
<td>9</td>
<td>19</td>
</tr>
<tr>
<td>Brahmin</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Village (Ward)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bhache (1)</td>
<td>5</td>
<td>4</td>
<td>10</td>
<td>19</td>
</tr>
<tr>
<td>Roplephant (5)</td>
<td>9</td>
<td>8</td>
<td>5</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>14</td>
<td>12</td>
<td>15</td>
<td>41</td>
</tr>
</tbody>
</table>
Table 5 reveals not only educational inequality at the caste/ethnicity level, it also reflects marginalization at the landscape level. The fact that the literacy levels between Gurung and Dalit participants mirrors the literacy levels between those living in Roplephant and Bhache highlights not only that greater numbers of Dalit live in Bhache, but also that those living in Bhache have suffered from less educational opportunity than its more accessible neighbor. This linked difference between caste/ethnicity and location is important because of the role that Dalit sharecroppers play in paddy farming in Ghanpokhara—both in Bhache and lower in Roplephant.

In visiting the two villages, the difference in literacy and educational levels between the different participants and their location is palpable. Yet study participants recognize the importance of education for themselves as well as for their children. One Dalit shopkeeper in Bhache commented, “School is the temple of education. In the future all people have to be educated” (December 13, 2014, Simultaneous translation by assistant), making reference to the fact that Dalit were not long ago excluded from participating in the educational system. Participants cited poor educational levels as a hindrance to villagers’ earning potential. Here is one example:

I’m planning to go to Dubai because I couldn’t get a higher education. Because of this, I can’t do any office-type work. My parents are old so I have to support them. The household economic condition here isn’t good. People who are poor like us don’t have good education and we can’t go to Khudi or Besisahar or Kathmandu because we can’t get good higher education. Without that we can’t get good jobs.
-Dalit farmer, Bhache, April 15, 2015, Simultaneous translation by assistant

The educational differences between Bhache and Roplephant, Dalit and Gurung reflect the importance of location in access to services and programs. In this instance, who lives
where matters. Location reflects differences in opportunity, both in terms of service as well as regarding agroecological conditions and opportunities.

That a large Dalit population lives on the steeper slopes of Bhache reflects tangible inequalities in both quality of cultivable land and exclusion from agricultural development. All land-owning Dalit participants in this study lived in Bhache. Their parcels were mostly smaller lots containing their homes and a small plot adjacent to or near their home. Regardless of ownership status, the land in Bhache is more challenging for paddy farming than land in Roplephant, and this impacts which rice varieties grow well here.

A large number of Dalit participants living in Bhache tenant farm at lower elevations. The juxtaposition between living high and farming low means that this population experiences greater localized mobility than their wealthier Gurung counterparts living in Roplephant. However, this mobility is tied to their household food security as subsistence farmers. They commented more frequently on the distances they walked to grow rice and to work in the fields and the greater suitability of their land for kodo. One Dalit farmer in Bhache remarked, “My fields are far from here, a one hour walk away” (December 11, 2014, Simultaneous translation by assistant). Another Dalit living in Bhache commented, “We grow Anga [rice variety] in lower land where we are tenant farmers. We only grow kodo [finger millet] on our own land” (April 16, 2015, Simultaneous translation by assistant).

Dalit face discrimination on a daily basis at the household level and in participation within groups. This discrimination continues in the form of touch-based discrimination surrounding food and liquids as well as on a participatory level.
We still aren’t allowed into their [Gurung] kitchens or to cook for them. Due to poor economic conditions we have to stay under the Gurung community as tenant farmers. There is still discrimination for everything. If we talk more in meetings then people put us down. They never hear our voices. At meal times we have to separate. Here [in Bhache] there are more Dalit, but all Dalit are in poor economic conditions. At Village Development meetings, budgets, they won’t listen to our voices. Every meeting is like this, even the mother’s group meetings. We can’t even share food at meetings—we bring our own food to meetings.

-Dalit farmer, Bhache, April 15, 2015, Simultaneous translation by assistant

However, this discrimination does not prevent Dalit and Gurung from working in the fields together or from mutual participation in other forms of agricultural labor. One Dalit woman in Bhache expressed working together thus: “There are only Gurung and Bika [Dalit] here. When farming together there is no problem, but we aren’t allowed in the houses of Gurung. We haven’t noticed any specific problems in access to information or programs because of caste” (December 11, 2014, Simultaneous translation by assistant). While this farmer didn’t notice problems of access to agricultural development or assistance based on caste, the remote location of Bhache coupled with the prevalence of sharecropping paddy farmers plays out in more subtle forms of discrimination.

The landless or near-landless status of many Dalit often excludes them from agricultural development opportunities. While women were targeted for programmatic support (even if ineffectually) in Ghanpokhara, there were no agricultural programs directed specifically towards Dalit farmers or towards sharecropping tenant farmers. One respondent phrased this exclusion in the subtle manner in which the discrimination plays out:

Q: They don’t come to give trainings in agriculture (in Bhache)?
A: They do, but not everyone gets to participate.
-Dalit farmer, Bhache, December 11, 2014, Direct translation from audio
While some might attribute this lack of presence by government development programs to the remote location of Bhache, one organization does a very good job at reaching out to Dalits in Ghanpokhara. Suaahara, a USAID and Nepal Technical Assistance Group (NTAG) nutrition project, targets pregnant and lactating women and their children under the age of two. Many Dalit participants spoke of receiving nutritional training, vegetable seeds, and chicks from Suaahara. The success of this organization in reaching the Dalit community shows that specific population targeting can be successful in Nepal’s more remote areas.

**Location and Social Structure Intersections with Rice Diversity**

Various varietal traits have been selected over time by farmers in Ghanpokhara to respond to the specific characteristics of their growing environments and microclimates, as well as to their household preferences and needs. Who grows which varieties and where partially reflects agroecological differences of location, and partially reflects cultural preference or uses.

We grow Kartike, Anga, and Kalo dhan. These varieties are especially for the hills here. Also Chhomrong. People that have lower fields can grow Jhinuwa, and Gaure. [...] I like these varieties because they are suitable for these hills. We once tried Pokhreli but it didn’t grow more.
- Gurung farmer, Bhache, December 14, 2014, Simultaneous translation by assistant

One variety in particular grown in the higher elevations around Bhache appealed to farmers for its medicinal property of cooling the body:

“We grow only a little Anga and save it for the hot/dry season. From Anga we prepare chang in the hot season. After washing Anga we consume the water mixed with other things because it is healthier. It makes you feel cold. Chang [made from Anga] is consumed by men and the red water by women because women don’t drink alcohol.”
- Dalit farmer, Bhache, April 16, 2015, Simultaneous translation by assistant
“Anga is used for medicinal purposes in the hot season. We use the wash water and the rice.”
-Gurung farmer, Bhache, April 16, 2015, Simultaneous translation by assistant

Agroecological characteristics play an important role in selecting rice varieties in Ghanpokhara. One very old, native variety, Tamare, grown by one older Gurung farmer in this study, can be broadcast seeded in dryer upland fields. But according to another farmer, this variety has been replaced by other varieties and is now verging on extinction. Another old variety that farmers say is native to the area ripens early, making it particularly valuable to Bhache’s higher elevations. Kattike/Kartike not only ripens early, one farmer also said that it could produce well in shade—making it suitable to Bhache’s steeper slopes surrounded by forest. Rice that ripens earlier benefits not only higher elevation farming, but it can help ward of natural predators. “Rats eat from the plant” (Gurung farmer, Roplephant, February 20, 2015, Simultaneous translation by assistant).

Fighting nature as well as animals in paddy production was a common theme in farming in Ghanpokhara.

“People used to plant Darmalli, but it takes a longer time to ripen and the buffalo will come down from the hills [and eat the paddy]. The other varieties take a shorter time to ripen.”
-Gurung farmer, Bhache, December 14, 2014, Simultaneous translation by assistant

“I had land in Simru but I couldn’t stay there so I moved. There were too many monkeys there.”
-Dalit, Roplephant, February 21, 2015, Simultaneous translation by assistant

“Rats don’t eat as much of the local rice.”
-Gurung farmer, Roplephant, February 20, 2015, Simultaneous translation by assistant

Cultural uses of rice varieties are evident in the varieties grown by Gurung farmers at the lower elevations of Roplephant. Gaure, the most aromatic variety
referenced by participants in this research, has particular importance to the Gurung community. It was the single most commonly grown rice variety by Gurung participants. Participants mentioned that Gaure (along with little grown Jhinuwa) is a traditional variety that they eat primarily on auspicious days, holidays, or when guests were visiting.

“We plant Naule in most of our land. [...] We cook Gaure only during Dasain and Tihar or other celebrations when families gather, so we don’t grow Gaure that much. Also Naule yields more than Gaure.”
-Gurung farmer, Roplephant, December 19, 2014, Direct translation from audio recording

“Gaure is a traditional variety. We have been growing it for many years.”
-Gurung farmer, Roplephant, December 8, 2014, Direct translation from audio recording

“People prefer Gaure at Dasain.”
-Gurung farmer, Roplephant, April 14, 2014, Simultaneous translation by assistant

Thus, cultural importance plays a key role in the continued cultivation of this rice variety.

Agroecological differences in Ghanpokhara reflect great social divisions and have implications for the rice diversity farmers chose to grow. This section has demonstrated that different demographics value and use genetic resources for different reasons, thus highlighting the importance of social differences in crop conservation narratives. As my results above indicated, caste and ethnicity map on to where farmers live, influencing which varieties are grown by whom, and where.

**Sharecropping & Land Tenure**

This study found that Dalit sharecroppers play such an important role in paddy production and rice conservation and that Nepal must consider serious land reforms and provide substantial support to these individuals or risk not only losing valuable genetic resources but face increased issues of food insecurity in the mid-hills. In Ghanpokhara,
sharecroppers play a pivotal role in the paddy production system. There is no caste or ethnic divide and no gender divide between who sharecrops. What divides sharecroppers from landowners is the amount of land a household owns, and how many mouths that household feeds. And while both Gurung and Dalit act as sharecroppers, greater numbers of Dalit farmers in this study used sharecropping as their primary means for rice production to feed their families.

The status of Dalit farmers as predominantly sharecroppers means that in Ghanpokhara, the caste system maps onto patterns of land tenancy. Because of the population concentration of Dalit in Bhache who tenant farm, they often walk long distances to farm more suitable paddy land at lower altitudes or they move seasonally to lower land for paddy farming. The important role that Dalit sharecroppers play in the paddy production system can not be overstated. The systematic stigmatization and exclusion of this population would imply that their role in agriculture is secondary to that of Gurung landowners. However, with greater numbers of outmigration of landowners, sharecropping has taken on ever-increasing role in farm management.

Patterns of land tenancy reveal key demographic changes within this rural agricultural system that have far reaching implications in Nepal’s overall food security and the ability of its people to feed themselves. With an increased occurrence of and need for sharecropping, the role of tenant farmers in maintaining rice diversity as well as the country’s food supply can not be understated. The link between land ownership and food security is stark. One service provider working in Bhache on underutilized crops commented:

It’s like this: Those who don’t have enough food don’t have land. Those who have land have barren land. Therefore they need tenant farmers. The tenant
farmers have to give half [of the harvest] to the land owners and keep the [other] half for themselves. [...] There are a lot of barren lands here. [...] They don’t think that they should give the land to Dalits who can grow food there. And the Dalits don’t want to work as tenants because they think it costs them more because of the workers they have to hire. They would rather work as hired labor themselves. This is why the lands remain uncultivated.

-Service provider, Bhache, December 11, 2014, Direct translation from audio

So while a plethora of fields exist for farming in Ghanpokhara, labor shortages keep them from cultivation. This pattern of abandoned fields tied to labor shortages can be broken down along caste/ethnicity lines.

Dalit sharecroppers often commented on the ease of procuring fields to farm and linked this directly to the shortage of labor in the area. This comment came from one Dalit farmer in Bhache, but many expressed the thought: “It is not difficult to find more fields to farm because of the lack of manpower”(December 12, 2014, Simultaneous translation by assistant). However, the lack of agricultural workers has different implications depending on landholding status and location.

According to the census, household size in Bhache averages 4.76 people. Farmers in this village walk long distances to sharecrop rice at lower altitudes. In Roplephant, households average 4.26 people. While census data indicates that household sizes between these two villages are fairly similar, the surveys and observation of this study indicated that Dalit households had more members living at home than Gurung families. The household surveys indicate that on average Dalit households have six members living at home while Gurung households have only four members living at home. One explanation for the discrepancy between reported and observed household size is that children living away at boarding school could be counted as part of the household. The
The difference in household size between Dalit and Gurung is important because of its direct relationship to land tenancy and farm labor.

Sharecropping households (predominantly Dalit farmers in Bhache) tend to have more family members living at home than their landowning counterparts, and thus have more available workers. (Note that none of the Dalit landowners who participated in this study tenanted out land.) To sharecroppers, the labor shortage among Gurung landowners means a greater availability of fields to work. Gurung landowners in Roplephant tend to have smaller households and struggle to find workers that can help them in the fields.

Many farmers in Roplephant voiced this concern:

I used to have the piece of land next to my house for myself, which takes 2 hal or 2 days to plough and plant rice, until last year. This year I gave that land to the tenants as well because I couldn’t find workers.[...] There aren’t many workers, if there were it would have been easier. We can find families that don’t have enough land and are willing to work on other people’s land.
-Gurung farmer, Roplephant, December 9, 2014, Direct translation from audio

There aren’t enough people who can work. The young men go to offices or other jobs. The old can’t work. [...] Now there aren’t many people and also it’s hard to find farm workers.
-Gurung farmer, Roplephant, December 8, 2014, Direct translation from audio

It is hard to find workers. Now we are older and young people are leaving and it is difficult to find workers.
-Gurung farmer, Roplephant, December 9, 2014, Simultaneous translation by assistant

Its hard to find people [workers]. There is a great demand for rice but no one wants to farm. That is the case.
-Gurung farmer, Roplephant, December 9, 2014, Direct translation from audio

Through interviews and observation, this study found that sharecropping Dalit farmers had larger households, with both more men and children living at home, thus allowing them to farm larger portions of land. Landowners with smaller household sizes had more cultivable land than their households could farm without assistance.
The owner doesn’t have enough people for farming so he asked me to farm.  
-Dalit farmer, Bhache, December 12, 2014, Simultaneous translation by assistant

Before we farmed it ourselves. But we didn’t have enough manpower so it was hard to do enough work.  
-Gurung farmer, Bhache, December 17, 2014, Simultaneous translation by assistant

I think they [the landowners] couldn’t manage the time. They have a lot of land and they don’t have a big family. That’s why they gave it to tenants.[...] They come to us and asked us to farm on their land.  
-Dalit farmer, Bhache, December 11, 2014, Direct translation from audio

Paddy farming takes a vast quantity of time, labor, and effort. As most households eat rice two meals a day, rice is a fundamental part of the Nepali diet. The number of people living in a household determines both the available amount of labor each household can invest in farming and how much rice they need to feed themselves. Most non-farm work, such as day labor for construction for men, would be done on an as needed, as-available basis. However, most work in Ghanpokhara was agriculture related.

The labor shortage and the prevalence of tenant farmers in paddy production affected farmers’ food security levels. Dalit tenant farmers, especially those living in Bhache, didn’t grow enough rice to feed their families for the whole year. Gurung landowners who let out all or a portion of their land generally had enough rice to feed their households for the duration of the year (and occasionally had enough to either trade or send to family members living in Pokhara, Besisahar, or Kathmandu). Day labor was also frequently paid in rice, reflecting household level security for those paying and insecurity for those working in exchange for food.

The unstable food security levels of tenant farmers have negative consequences for the long-term sustainability of the agricultural system in this area. Dalit tenant farmers
expressed much anguish at the traditional sharecropping arrangement that gives 50% of the harvest to the land owner, yet have little choice if they want to feed their families.

A tenant farmer is not like people with their own fields; people with their own fields have it easier because they don’t have to give half of the harvest. The owner [whose land I cultivate] doesn’t have enough people for farming so the owner has asked me to farm. [...] I am sad when I do all this work and then have to give half to the owner. If we didn’t give to the owner then we would lose the right to cultivate. The landowner would give the land to others to cultivate. We agree to 50-50 before when we agree to use the land. There is no negotiation of 50-50, we have to pay half. If we try to negotiate, the owner says leave it, I can give the land to others.

-Dalit farmer, Bhache, December 12, 2014, Simultaneous translation by assistant

As a farmer I would have liked to have my own land so that I could work more and grow more. I wouldn’t have to buy anything. I would like that to happen.[...] We have to work on other people’s land and most of the times you have to share with them. The rich who have land don’t work hard on the fields, but they get rice, maize, kodo etc. We work so hard, but it is never enough.

-Dalit farmer, December 8, 2014, Roplephant, Direct translation from audio

We work and the landowner gets without working. We feel bad because we don’t have our own land. We don’t like working for nothing. The landowner, he doesn’t provide any other support beyond providing land.

-Dalit farmer, Roplephant, April 15, 2015, Simultaneous translation by assistant

This notion of “getting without working” highlights the value of tenant labor.

Sharecroppers enabled landowners who otherwise would not be able to farm their own land to reap a harvest. In effect, this system ensures that land owners benefit from free labor while sharecroppers with few other opportunities or resources have no choice but to participate in the system if they wish to feed themselves and their families.

In respect to rice diversity, landowners continue to hold responsibility for providing rice seed, yet this study found that they frequently let tenants decide which rice varieties to plant on the land. This agricultural decision making is one of the few instances of agency for otherwise highly marginalized and excluded Dalit and women farmers.
In Ghanpokhara VDC there is no legal obligation associated with land tenure arrangements, however, the traditional arrangement of splitting the paddy harvest 50-50 between tenant laborers and the property owners remains the defacto standard. Many land owners would prefer to abandon fields rather than adjust this arrangement.

Q: Why not rent out your four ropani to tenants?
A: Before it was easier to find tenants. People that have tenants had previous connections. First we searched for tenants, but tenants said they didn’t want to do 50-50 sharing. No tenant would be better than that so we leave the field empty. Nowadays young people, and tenants also, they don’t want to cultivate so it’s difficult to find someone to cultivate [fields].

Gurung farmer, Bhache, December 14, 2014, Simultaneous translation by assistant

A LI-BIRD representative new to the area confirmed and elaborated on this finding while also highlighting the role of caste in the tenant system:

The people who have more land would rather leave their land barren than give it to the poor. The poor can’t buy land. Only the government can do it through land reform. [...] [Landowners] don’t get much profit from renting the land so they leave it uncultivated. If you go up [hill] you will see many lands left barren. [Gurung] don’t think that they should give the land to Dalits who can grow food there. And the Dalits don’t want to work as tenants because they think it costs them more because of the workers they have to hire. They would rather work as hired labor themselves. This is why the lands remain uncultivated.

-Service provider, Bhache, December 11, 2014, Direct translation from audio

The inflexible tenure system could be one explanation for the number of abandoned fields. Farmers often expressed the inflexibility of the tenure arrangement in terms of tradition:

We get 12-13 muri (baskets of rice) but we have to give half of it to the owner. That’s the traditional rule so we have to do it.

-Dalit farmer, Roplephant, December 17, 2014, Simultaneous translation by assistant

We have this tradition in the village since long time. Ke garne (What can we do)?

-Dalit farmer, Bhache, December 11, 2014, Direct translation from audio
It’s hard work but it’s not your land; if it were your land it would be nice. [...] The 50/50 split is no choice, we can’t do anything about it. We work really hard with feet deep in the mud, but we have to give the owners half.

-Gurung farmer, Roplephant February 20, 2015, Simultaneous translation by assistant

The interviews and observation revealed that from both the landowner and tenant perspective, there is little stability in the current land tenure arrangements of Ghanpokhara. While some tenants cultivated paddy on the same parcel of land for up to ten years, most tenant respondents farmed a landowner’s fields for only one to three years before moving on to find more productive or more convenient land to farm. Sharecroppers inability to develop a sustainable, long-term relationship with the fields they farm means that sharecroppers have little reason beyond short-term productivity for caring for the fields they farm and continuing to steward the country’s valuable crop genetic resources.

**Sharecropping and Rice Diversity**

Most farmers in this study explicitly prefer local varieties, however they also expressed a preference for higher yielding varieties, even among local varieties. This Gurung farmer from Roplephant combined yield with grain quality: “I chose Dharmalli because it yields better. The rice grains are good and long. The cooked rice is filling” (December 8, 2014, Direct translation from audio). One Dalit farmer compared two local varieties and opted for the one that yielded higher on her land:

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9 Nepali law regarding tenant farming states that a registered tenant has a right to own half of the tilled land. However tenants are generally not aware of this law. If they do know about it, it is difficult and time consuming to register as a tenant, and the law is not enforced. Additionally, landowners know to drop a tenant that has farmed his (or rarely her) land (Crowley Program, 2011).
We only grow Anga. It’s a higher yielding variety so we decided to plant this. We tried Seto Dhan but we only got less rice than we got with Anga, so we decided to plant Anga. If Seto Dhan yielded like Anga we would have changed.
-Dalit farmer, Bhache, December 11, 2014, Simultaneous translation by assistant

Productive varieties become even more of a necessity when households cannot grow enough rice to feed their families:

“We don’t grow enough rice for our family; we only grow enough for 3 months.”
-Dalit, Bhache, December 11, 2014, Simultaneous translation by assistant

“No, I don’t grow enough rice to feed the family. I have a big family.”
-Dalit farmer, Bhache, December 12, 2014, Simultaneous translation by assistant

The fact that sharecroppers must share their harvest with landowners, when they struggle to feed their own families increased the need for rice varieties with high productivity:

We have to ask the owner what to grow. We want to grow what yields more but the owner doesn’t want to eat that. We grow what the owner wants. [...] We grow only Ghaure and Pokhreli. We like Ghaure more because Pokhreli doesn’t yield as much.
Dalit farmer, Roplephant, December 17, 2014.

No, we don’t grow enough for our families. It is just enough for three months. We have to give half to the owner. It is three months because sometimes we have kodo and maize. It’s enough rice only for two months.
-Dalit farmer, Bhache, December 11, 2014, Simultaneous translation by assistant

Farmers that struggled to meet their household food security needs prioritized rice varieties with high productivity. These farmers tended to have larger households and/or they sharecropped for a large portion (if not all) of their paddy production. While farmers combine their various household needs and agroecological conditions to select their rice varieties, the need for a greater quantity of rice contributed greatly to their voiced preferences. This study found that household size directly correlates with both land tenancy and the need for more rice to satisfy household food security needs. As the
results from the next section show, household size corresponds with caste/ethnicity and landowning/sharecropping status.

Decision-making also plays an important role in the tenant/owner paddy farming dynamic. Who has responsibility for deciding what varieties to plant can impact conservation efforts. While sharecroppers often make decisions on what varieties to grow, they generally confirm their decisions with the landowner:

As the landlord, we decide which varieties [sharecroppers] grow on which land and we also provide the seed. If we didn’t do like that then tenants would be difficult to find. We need to make tenants happier.
-Gurung farmer, Bhache, December 14, 2014, Simultaneous translation by assistant

“The tenant asks us first what to grow.”
-Gurung farmer, Bhache, December 17, 2014, Simultaneous translation by assistant

“My tenants decide what to plant and I let them do that since I can’t farm any way. This minimizes the conflict.”
-Gurung farmer, Roplephant, April 14, 2015, Simultaneous translation by assistant

We ask the owner what we can grow and we grow that. We can talk with the owner and sometimes tell him of our interest in growing certain varieties. The owner doesn’t refuse us.
-Dalit farmer, Bhache, December 17, 2014, Simultaneous translation by assistant

Maybe [the sharecropper planted Dalle] because the rice is filling or maybe because it gives a good yield. I wouldn’t really know why he planted that one. I never asked him.
-Gurung farmer, Roplephant, December 8, 2014, Direct translation from audio

With the increasingly important role of sharecroppers in the paddy production system of Ghanpokhara, whether the landlord or the tenant makes decisions and what they prefer will have an impact on the in situ conservation of traditional rice varieties. The omission of tenant farmers from crop conservation narratives needs to be reconsidered.
Wealth and Outmigration

This study found that in the context of Ghanpokhara, degrees of wealth matter. Patterns of land tenure reflect economic wealth and out-migration. The increasing out-migration of family members of economically wealthier landowners means that poorer families with larger households provide the community with its valuable agricultural labor. In Nepal, nearly 30% of the country’s GDP comes from remittances (World Bank, 2016) and 56% of Nepal’s households receive some form of remittance, predominantly from Saudi Arabia, Qatar, India, or Malaysia (CBS, 2011b). While specific census data at the ward level for Roplephant and Bhache was not available, Figure 5 shows the age breakdown for the whole of Ghanpokhara VDC, highlighting the large out-migration of men between the ages of 20-44.

![Ghanpokhara VDC population by age and sex](data from CBS, 2014a)

This large outmigration of working age men reflects what I found while in Ghanpokhara. Many respondents commented on the large out-migration of young people, and of men in particular. A lesser out-migration of women occurs in this same age
bracket, mostly to take jobs in Besisahar or elsewhere or due to the practice of women leaving their natal villages upon marriage to live with their husband’s family. The out-migration of young men from this area highlights the need for additional income generation opportunities within the subsistence agricultural system. One Gurung male working as a security guard on the ex-prime minister of Qatar’s yacht explained his motivation to work abroad and why he thinks out-migration of farmers from Ghanpokhara is inevitable:

I left because I had no money here and I needed to earn money. That’s why I went abroad. Since agriculture is the only income source here and that too is just enough for the family—and we have to pay workers—there’s no other sources of income so I had to go abroad. [...] It’s sad that everyone is leaving home. If someone dies it’s hard to gather people for a funeral—it’s come to that. A lot of people have gone to Europe and the Gulf countries. [...] I don’t think anyone is going to come back and farm. For the sake of kids they have to live in cities—there are no good schools here. But we won’t sell our land. If we don’t find workers we will leave the land barren and come visit once a year. Even though this house is old, we don’t want to sell it.[...]It’s really sad everyone is leaving. It’s not just our problem, it’s everyone’s problem. With my parents we need to find tenants because they don’t want to go to Kathmandu. They like it here but when my parents die no one [in the family] will come back here. We need to live in cities because of schools, and good hospitals.
-Roplephant, February 21, 2015, Simultaneous translation by assistant

This statement reveals a need for income, but it also reflects the importance of public services such as better education and health care. While Gurung participants in this study had children away at boarding schools or mentioned family members living with children in cities for school, these comments were missing from Dalit participants. The financial resources it takes to send a child to boarding school highlights one way that Gurung and Dalit differ in their ability leave Ghanpokhara. That wealthier Gurung families have the ability to send their children to better schools distinguishes them from poorer sharecroppers.
Results from the 41 farmer interviews for this study suggest that different patterns of out-migration exist between land owners and sharecroppers. Wealthier Gurung landowners have greater financial resources and access to loans, thus access to money for the recruiting agency fees and other expenses associated with leaving Nepal as migrant workers or access to the resources needed to send their children away for better education. Wealth differences between subsistence farming landowners and subsistence farming sharecroppers are significant, and these differences impact who can tap the resources needed to leave. In seeking employment as migrant labor, degrees of wealth matter. The cost associated with migrating to the Gulf States or Malaysia can reach over USD$1000. Most residents in Ghanpokhara cannot afford this amount and therefore borrow money from among their neighbors or from a local micro-finance group to go abroad. One Gurung farmer in Roplephant commented,

Six [of my sons] are in Saudi Arabia and one is in Qatar. [...] They all took loans to go abroad. They got loans from villagers, not from a credit co-op. Sons can work really hard and many people have to depend on their sons who are abroad.

-(February 20, 2015, Simultaneous translation by assistant).

This ability to tap the community for resources depends on both trust and access.

One Dalit woman who had a small house in Roplephant but had recently moved to Chitwan (in the Terai) expressed her inability to secure a loan herself:

The (Gurung) woman of the house where I am staying (at this time) arranged the loan from this village. The interest was 3%. The loan was in the homeowners name. [...] Since I was poor people wouldn’t trust me with a loan, but they would trust my friend.

-Roplephant, February 21, 2015, Simultaneous translation by assistant

Trust and relationships play an important role throughout the communities of Roplephant and Bhache, from securing loans to finding families or land for sharecropping.
We are actually from Bhache but we have known the owner of the land in Roplephant for a while and now the owner wants to stay in Kathmandu, so asked us to farm.
-Dalit farmer, Roplephant, December 17, 2014, Simultaneous translation by assistant

One important finding of this study is that as opportunities expand for wealthier individuals seeking education and jobs off-farm, less advantaged individuals play an increasingly important role in farming at the landscape level. Ghanpokhara has a long history of farmers leaving the region to work in the Indian or British Armies (particularly among Gurung men) and then later returning to the area to continue farming, drawing a pension from their time in the army. Interviews conducted in Ghanpokhara suggest that out-migration not only continues within this population, but has increased with expanded opportunities to leave Nepal for employment abroad. With outside sources of income from pensions and remittances, Gurung farmers have greater resources that allow them to leave farming.

The result of this out-migration of wealthier Gurung is that sharecropping, lower class, landless or semi-landless Dalits increasingly manage the agricultural landscape. With the increasing out-migration of wealthier Gurung landowners (and their children), Dalit sharecroppers play an increasingly important role in Ghanpokhara’s paddy production system. The needs and preferences of the women and Dalit tenant farmers who remain in Ghanpokhara to farm must be addressed for successful agrobiodiversity conservation. The patterns contributing to the increasing trend of sharecropping are not likely to change. However, as Dalit improve their access to resources they too will likely leave farming behind. It is not a question of if, it is only a matter of when.
CHAPTER 6. DEVELOPMENT INSTITUTIONS

Bhache’s and Roplephant’s social and agroecological dynamics revealed issues of exclusion, marginalization, and location-based segregation at the village level. These variables affect not only rice conservation but also Nepal’s efforts to craft inclusive development policies and programs. With the Nepali government’s push for adoption of improved rice varieties coupled with DADO’s promotion of improved seed, the question remains as to who accesses this seed and by what means. This chapter examines institutional processes of agricultural development programs. It finds that access to agricultural programs and resources maps onto landownership, thus leaving landless or semi-landless sharecroppers out of development schemes, and inadvertently contributes to the conservation of traditional rice varieties.

With 53% of its population located in the mid-hill and mountain ecozones, and 81% of the country’s population living in rural areas (CBS, 2014b), addressing issues of exclusion in these remote areas is imperative to development. As the last chapter revealed, sharecroppers play an ever-increasing role in the management of paddy production. This raises questions of who agricultural development programs target and the effectiveness of these programs. This chapter tackles agricultural development institutions by elucidating what agricultural development looks like in Ghanpokhara. It then focuses on target populations, highlighting the spatial and social targeting used by state-level development programs. The third section of this chapter then presents opportunity gaps, highlighting how development projects miss opportunities. The chapter concludes by tying spatially- and socially-targeted development schemes to rice diversity,
and articulating an opportunity for conservation efforts to target sharecroppers as important stakeholders in agrobiodiversity conservation.

**Agricultural Development**

Both ACAP and DADO have agriculture-oriented development projects in Lamjung District. ACAP and DADO both encourage the use of modern rice varieties, and occasionally distribute seed to this end. Other agricultural projects they sponsor include a mushroom group, a honey production group, and a women’s vegetable group. Despite various programs in Lamjung District, the more marginalized participants in this study rarely had access to programs sponsored by these government-affiliated organizations.

A disconnect between preference for high-yielding varieties and access to the seeds has significant implications for conservation efforts. As much as farmers voiced a preference for local rice varieties in my interviews, occasionally farmers grew an improved, modern, and/or hybrid variety. Some of the improved varieties grown by farmers included: Khumal-4, Khumaltar, and Radha-7. Participants could have grown other modern varieties, but farmers could not always remember all of the varieties they grew. Improved varieties often lack the adaptive and desired traits mentioned in the previous chapter because they have been developed to fit a wide range of environments. However, the modern varieties sometimes have characteristics that farmers appreciate, the higher yield in particular. The quotes below highlight 1.) a Brahmin farmer’s access to improved seeds through ACAP and 2.) Dalit farmers’ preference of high yielding seeds (and who provides that seed):

The seed for Khumal-4 came from ACAP. We started growing this last year. Before that, every year was local rice. We saved seeds of Khumal-4 for the future.
Last year when we first grew it we had 25 muri harvest but had expected only 15 muri. This year we only planted it in a small amount of land (two ropani) and got 12-13 muri. This is the second year growing Khumal-4. 

[...] The taste of local is better, but the productivity of the other is higher. I prefer the local rice’s taste.
Brahmin farmer, Roplephant, February 20, 2015, Simultaneous translation by assistant

Normally we only grow Radha-7 because it has the highest production. We find it tasty and aromatic. [...] I tenant land from the big [Gurung] house. We split the harvest 50-50 and the landowner provides the seed. I always grow Radha-7.
Dalit farmer, Bhache, April 15, 2015, Simultaneous translation by assistant

Sometimes we mix Khumaltar (improved variety) and Dalle (traditional variety). [...] We prefer Khumaltar because it’s soft and Dalle is hard to chew and it takes longer to cook.
Dalit farmer, Bhache, April 16, 2015, Simultaneous translation by assistant

Who has access to these modern seeds is of interest to this study. The fact that ACAP and DADO both encourage adoption of modern varieties and sometimes distribute seed is of particular note. While these institutions promoted modern rice varieties, and in some instances distributed seed, sharecroppers and semi-landless farmers did not benefit from these efforts. Yet many Dalit sharecroppers have an explicit preference for high-yielding varieties (as the quotes above demonstrate). The sections below highlight the targeting of certain populations for development efforts. This chapter highlights a disconnect between sharecropping farmers’ preferences for improved rice (as found in the previous chapter and above) and their lack of access to agricultural development program improved rice seed.

**Development’s Target Populations**

This study found that the District Agriculture Development Office (DADO) and the private-public Annapurna Conservation Area Project (ACAP) target landowners and the village of Roplephant for agricultural programs. Given the results from the previous
chapter highlighting the marginalization and exclusion of semi-landless sharecroppers living in Bhache, this finding on agricultural institutions targeting more privileged populations reinforces the marginalization and exclusion of Dalit sharecroppers. Additionally, the targeting of landowners also excludes women from programs and opportunities.

Both women and Dalit suffer from marginalization in the paddy farming system and from exclusion from agricultural programs. In Ghanpokhara, the systematic exclusion of women and Dalit from existing programs manifests itself to varying degrees through both spatial segregation and exclusion from existing programs. Exclusion from programs and access to various resources—both developmental and natural—fall along spatial lines, with landowners in Roplephant targeted for projects and sharecroppers and Dalit living in Bhache excluded. Government-sponsored programs target villages with greater access to transportation and amenities, making more remote villages like Bhache less serviced, despite their need.

**Spatial Targeting**

Roplephant’s temperate climate, fertile soils, and available irrigation combined with its relative ease of access, make it a target for agricultural development programs. The private-public Annapurna Conservation Area Project (ACAP) targeted Roplephant for agricultural development programs. One representative of ACAP commented, “We chose Roplephant [for the vegetable group] because it is near the eco-trekking route, Besisahar, and Manang. And because it is flat. It’s good to sell vegetables along that route.” The government District Agricultural Development Office (DADO), located in
the district headquarters of Besisahar, also provides programs in Roplephant that it does not offer to other, more remote areas. A Gurung farmer in Roplephant said,

Since we are close to Besisahar and this place is also good for farming, they think that we should opt for high yielding varieties. [...] The people from the agriculture office constantly tell us to grow other things like vegetables since we also have irrigation here. They keep coming to meet dai (older brother, used as a term of respect) and they tell him that he should convince the villagers. They also gave trainings on vegetable farming.
-Gurung farmer, December 9, 2014, Roplephant, Direct translation from audio

These quotes highlight the fact that farmers in Roplephant have reliable access to government-sponsored agricultural programs and training—opportunities lacking in Lamjung’s more inaccessible villages such as Bhache or Ghimrung.

This study found that farmers in Bhache had little knowledge of agricultural programs or opportunities compared to their counterparts in Roplephant.

Q: What agriculture organizations are you aware of?
A: None. We do everything ourselves.
Q: And if you have problems who do you talk to?
A: Now we don’t have problems, but if we do, we don’t go anywhere.
-Dalit farmer, Bhache, December 17, 2014, Simultaneous translation by assistant

We heard that the DDC (District Development Committee) gives to the VDC (Village Development Committee) and the VDC can give to farms, but we haven’t used this resource. We never ask anyone for help—there is no specific organization in this area. If anyone needs anything, then people have to go to Khudi and pay their own way to get there.
-Dalit farmer, Bhache, December 11, 2014, Simultaneous translation by assistant

This lack of awareness of and access to agricultural institutions reflects a difference in outreach and extension efforts between the two villages. Bhache’s more remote and inaccessible location reflected its lack of agricultural assistance. Most farmers in Bhache could not identify programs or trainings available in the area. However, one Pokhara-based NGO, LI-BIRD, had recently established a field office in Bhache for a project
involving under-utilized crops, selecting this village partly because of its larger Dalit population. LI-BIRD intends to focus their efforts to benefit Dalit and women. One Gurung participant familiar with the organization’s presence in the area had a positive outlook on their future role in the village:

We are happy because LI-BIRD is doing something for agriculture here. We are glad they are here doing their work. This area is a little high and remote so LI-BIRD starting here is good, it is important for the villagers.
-Gurung farmer, Bhache, December 14, 2014, Simultaneous translation by assistant

This new development project specifically aims to target more marginalized populations. It remains to be seen how effective their project will be given the compounded social hierarchies and structures at play in this ward.

**Social Targeting: “Good Character”**

The dichotomy of agricultural inputs and agro-educational services between Roplephant and Bhache reflects not just a difference of topography and location, but also of greater social inequality. Government and private-public bimodal organizations working on development projects at the local level often have a requirement that marginalized individuals should be included as part of a project’s local board members. However, this study found that even when this requirement exists, the opportunity for women and Dalit can be obscured by the fact that in Nepal, Gurung janajati (indigenous ethnic group) are considered a marginalized group. This comment from a VDC representative from ACAP’s Conservation Area Management Committee (CAMC) highlights the conflation of marginalization between women, Dalit, and janajati¹⁰:

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¹⁰ Degrees of marginalization are important in addressing development issues in Nepal. The lack of services and support in Nepal’s rural areas means that these demographics are
There are 14 members of the committee plus one VDC secretary. The committee members include nine elected from the wards, and then together with ACAP they choose five more members to make it inclusive. The remaining five include women and Dalit. Now there is one woman and one Dalit. But actually there are now two women because one man had to leave and they got a woman in his place. The three remaining are janajati (Gurung and Tamang).

-Besisahar, April 22, 2015, Simultaneous translation by assistant

This quote demonstrates that janajati could be used to fill positions intended for marginalized populations, even in a community where janajati constitute the majority of the population. Regardless of Dalit or female presence on committees, marginalized individuals had a difficult time having their voices heard at meetings. For example this Dalit farmer said, “If we talk more in meetings then people put us down. They never hear our voices” (Bhache, April 15, 2015, Simultaneous translation by assistant).

Programs also target farmers of “good character” for participation. This study found that “good character” was used as a criteria for participation in many state-sponsored agricultural development schemes. Exactly what “good character” meant could not be fully determined and raises questions as to the inclusion of diverse classes and castes in the conceptualization of “good character.” In the case of the vegetable group

all in need of aid. Even in this study, all participants are subsistence farmers without abundant resources. However, the degrees of marginalization and wealth between individual demographics plays an important part in determining who has access to the very little that the government and NGOs provide in terms of support and assistance.

11 While “good character” did not serve as a proxy for loan collateral from financial institutions, non-financial institutions used “good character” to determine who would participate in certain development programs. This study found that “good character” was used in deciding participation for programs ranging from support for plastic hoop houses, to participation in honey bee groups, and the women’s vegetable group.

12 While “good character” did not serve as a proxy for loan collateral from financial institutions, non-financial institutions used “good character” to determine who would participate in certain development programs. This study found that “good character” was used in deciding participation for programs ranging from support for plastic hoop houses, to participation in honey bee groups, and the women’s vegetable group.
where farmers received support for hoop houses, one farmer was used as the primary contact and recommended others to participate. Over the course of my time interviewing participants in this study, it became evident that many of the farmers benefiting from hoop houses were cousins of the initial farmer. This social (and familial) network of relations reveals a complex dimension of development. When programs begin working in an area, how do they solicit participants? The “good character” litmus test emerged over the course of my interviews in multiple settings ranging from bank loans to microfinance to agricultural development projects.

In one instance a Dalit woman who had moved to the Terai had difficulty obtaining a microfinance loan from her community. However, a Gurung friend of hers procured the loan and then in turn lent the money to her Dalit friend (which she subsequently repaid on time- as indicated by both parties). This one anecdotal example reveals that “good character” may have to do with caste-related stereotypes. However, when asked explicitly if caste had to do with her rejection from a loan, she did not think that played a role.

Intersections of caste, landownership, and gender (among other social dimensions) play a role in the constitution of “good character.” Limiting development and finance opportunities to those of “good character” reveals the difficulty some farmers face in accessing opportunities. In addition to the social differences of caste/ethnicity, most agricultural projects available to residents of Ghanpokhara target landowners. This targeting maps on to social structures of male Gurung farmers. With landownership in Nepal passed through male heirs, and few Dalit in this region owning substantial landholding, the targeting of landowners excludes women, sharecroppers, and Dalit
landless or semi-landless farmers. Based on this study’s interviews, none of the agricultural programs in the area specifically targeted sharecroppers. Because Dalit represent a disproportionately large percentage of Nepal’s landless or near-landless population, the omission of sharecroppers from agriculture and development programs means that this population is less likely to benefit from agricultural development efforts. LI-BIRD’s efforts in Ghanpokhara focusing on under-utilized crops were too recent to determine if they will have a positive outcome for sharecroppers. But one of the LI-BIRD staff recognized the importance of land ownership and a more equal land system, and also the futility of such a need, “People who work should own more land, but that can’t be done.” (Bhache, December 11, 2014, Direct translation from audio)

State-level agricultural programs target landowners. Despite the important role that sharecroppers play in managing paddy production systems, agricultural development programs omit them from development efforts. Not only do most programs target landowners, but financial opportunities are also geared towards those who own land. The Agricultural Development Bank in Besisahar, which is 51% government owned, 49% public owned, explicitly prefers to issue loans to women, and have preferential interest rates for females. However, the bank only issues loans to land owners, and women farmers—both Dalit and Gurung—rarely own property. Because women rarely own the land they live on or farm, their husbands must guarantee the loan.

Clients must give a guarantee as a deposit. Alternatively, they can use a collateral deposit. We will take the land title or building title as a deposit. Yes, to procure a loan you must be a land or building owner. Loans are for landowners only. Initially in the early days we had more men approaching for loans but [...] they don’t pay back the loan properly. Now we trust women more because they payback loans more regularly. We prefer to give loans to women rather than men. It’s not a policy, it’s just our experience. The national law says that if we issue a loan in a woman’s name then the loan is discounted 1% of the land value. So the
policy wants to push women forward. Women get permission from their husbands to use the land title to get the loan. The same scenario is not possible (at least we have no record of this) for tenant farmers to get a loan. They need to have something to deposit.

-Representative from Agriculture Development Bank, Besisahar, April 12, 2015, Simultaneous translation by assistant

As both tenant farmers and women must have collateral to support their loan\(^\text{13}\), their access to financial resources depends not on themselves and their individual potential, but on that of landowning men. But while women do have access to some resources through their husbands and targeted programs, Dalit sharecroppers did not benefit from this support. Institutional targeting of certain populations—such as landowners—highlights issues of inequality and also has implications for agrobiodiversity conservation efforts.

**Opportunity Gaps**

When asked about the presence of agricultural programs or aid in general, most respondents, especially in Bhache, could not indicate an organization involved in assistance. Despite the lack of awareness, in Roplephant and Bhache women’s groups known as aama samuha and Dalit groups organize meetings for their members and provide an opportunity for targeted development programs. Most villages have a mothers group that meets regularly and organizes service projects (such as trail maintenance or cultural programs and education). Aama samuha are open to all women in a village, regardless of caste\(^\text{14}\). NGOs or government programs often reach out to communities through the village aama samuha to disseminate information or to help organize events in

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\(^{13}\) In Nepal landownership passes primarily to male heirs, leaving most women and landless or semi-landless peoples without the collateral of a land title to secure a loan on their own. “Good character” does not serve as a collateral proxy for financial institutions, but did confer eligibility for participation in certain government-sponsored agricultural development schemes.

\(^{14}\) Despite the inclusive nature of *aama samuha*, participation is not equal, especially in activities that involve food preparation and service.
a village. Despite the ubiquity of aama samuha, state-level agricultural development does not reach out to either aama samuha or Dalit groups in Ghanpokhara for programs. Instead they target particular community members of “good character” for project dissemination and participation.

The District Agriculture Service Center (which is the Nepali equivalent of extension) based in Khudi and the District Agricultural Development Office (DADO) based in Besisahar claim to work with women’s groups at the village level, however participants of this study reported that agricultural service providers do not reach out to the mothers’ groups for agricultural outreach, training, or seed distribution.\(^{15}\) The fact that every villager is aware of the mother’s group emphasizes the vital role that these groups play at the village and ward level. The ubiquitous nature of aama samuha indicates that this opportunity gap is real and that the burden lies with NGOs and government programs to tap into this valuable resource.

Despite the lack of targeting made by development projects to the aama samuha in this study, government agricultural representatives indicated that they do in fact reach out to aama samuha. The disparity between what aama samuha claim and government representatives claim may have to do with the lack of resources on the part of extension agents. With limited resources and limited employees, extension efforts in Nepal’s more remote villages such as Bhache become difficult.

Dalit group participants claimed that only rarely outsiders came to their meetings. As the marginalization of the Dalit community is palpable in the rural agricultural setting,

\(^{15}\) The one agricultural NGO with a field office in Ghanpokhara had only recently established a presence, making it unlikely that their activities would impact participant responses for this study.
extension efforts could be maximized by reaching out to these groups. Institutions currently miss the opportunity to target marginalized sharecroppers for agricultural development, and Dalit groups offer an opportunity for outreach and conservation efforts. Some might attribute a lack of presence by government development programs targeting Dalit to the remote location of Bhache. However, this study found that one development project did a very good job at reaching out to Dalits in Ghanpokhara. Suaahara, a USAID and Nepal Technical Assistance Group (NTAG) nutrition project, targeted pregnant and lactating women and their children under the age of two. Many Dalit participants spoke of receiving nutritional training, vegetable seeds, and chicks from Suaahara. The success of this organization in reaching the Dalit community shows that specific population targeting can be successful in Nepal’s more remote areas.

**Improved Rice**

Modern rice varieties are likely arriving in the area by way of wealthier Gurung landowners with the ability to purchase seed or are targets of improved-seed distribution projects. Most participants in this study saved seeds from year to year and if they wanted to grow another variety, they would trade seeds with neighbors or with family members in a different household. By promoting improved seed to landowners in Roplephant, institutions may inadvertently be aiding the conservation of traditional rice varieties in Ghanpokhara.

With the Nepali government’s push for adoption of improved rice varieties coupled with DADO’s promotion of improved seed, the question remains as to who accesses this seed and by what means. Improved rice seed comes to Ghanpokhara by two primary means: either purchased or distributed by ACAP or DADO. Landless and semi-
landless sharecroppers likely don’t have the funds to purchase seed from Khudi or Besisahar. As shown above, this study found that ACAP and DADO targeted landowners and farmers of “good character” for their programs, leaving other marginalized groups such as Dalit and sharecroppers, to procure new seeds on their own. Not only do sharecroppers not have the means to purchase seed, but it is the norm for landlords to provide seed.

The disconnect between a sharecropper’s desire for high yielding varieties and their lack of access to improved seed through development projects contributes to the continued cultivation of local rice landraces. A landlord’s willingness to purchase improved seed or to accept seed from ACAP or DADO determines a sharecropper’s ability to plant improved seed. As elucidated in the previous chapter, this study found that sharecroppers had a greater preference for higher yielding varieties, and thus a greater openness to adopting high-yielding improved seed. And Gurung landowners preferred culturally–significant aromatic varieties such as Gaure and Jhinuwa. Findings from the previous chapter also indicated that sharecroppers have some degree of agency in what rice varieties they plant, however, they depend on the landlord to provide seed. This key finding on the disconnect between desire and access of those stewarding agricultural land highlights an opportunity for agrobiodiversity conservation. By more effectively targeting those responsible for stewarding the country’s more remote agricultural landscapes and

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16 It is unclear whether Dalit and other farmers whose primary agricultural production comes from sharecropping are automatically omitted from inclusion in agricultural development projects because they do not have “good character,” or rather they are omitted because they do not own land. The intersection of land ownership and “good character” merits further examination.
its valuable crop genetic resources, conservation policies and programs can increase inclusion rates while promoting the conservation of crop resources.
CHAPTER 7. CONCLUDING DISCUSSION

Study Limitations

Going into this study I clearly defined members of a household as those individuals living at home. However, in the context of Nepal, households are more nuanced and complex than simply the family members living at home. A primary respondent might assume that her sons living in Dubai, Malaysia, and/or Besisahar are part of her household. Equally, she may or may not consider her married daughter staying with her for the year as part of her household. Flexibility in household definitions is key to understanding the nuances involved in household and agricultural participation and decision-making. Future studies should consider how primary respondents conceive of their household composition and how their household composition impacts agricultural decision-making.

Because fields used for sharecropping change with relative frequency and landowners may let fields go uncultivated, defining the farmstead unit or land in farming can be complicated. A farmer’s fields in Nepal are frequently far from their home; does this impact how farmers define their farm? Additionally, landowners in Ghanpokhara often maintain forest cover for fire wood. These and other land-related distinctions affect the way that farmers define their land and their farming practice. Understanding how participants themselves comprehend and relate to these aspects of farming and land tenure would clarify some of the greater complexities of land tenure systems.

Some of the above questions could be worked out with a better grasp of both the Nepali and Gurung languages. Differences in meaning surrounding land tenure may have been self-evident to my research assistants and assumed on my part. A great amount of
information can be lost in translation, even when accompanied by a research assistant translator. Due to participants’ sensitivity discussing household food security and issues of caste, audio recordings were not made for the majority of interviews. To compensate for this project’s lack of digital audio recordings, I took extensive notes that attempted to remain faithful to the translations offered by my research assistants as well as to the participants’ body language. While my research assistants were fluent in Nepali and English, they were not local residents familiar with the Gurung culture and language.

While research for this study revealed important levels of participation by sharecroppers and marginalized individuals in Ghanpokhara’s paddy farming system, Nepal has undergone two major, and potentially system-altering events, since I concluded the field work for this study. My research in Lamjung District concluded at the end of April 2015, and I left for the district for the last time on the morning of April 25, the same day Nepal experienced a 7.8 magnitude earthquake. The epicenter of what Nepalese call the Great Quake was in Gorkha District, directly east of Lamjung. The earthquake has brought structural changes to Nepal’s agricultural systems in the mid-hills that may impact the findings of this study.

Just how the earthquake will affect the subsistence farmers who conserve Nepal’s rice genetic diversity remains to be studied. While the farmers in Ghanpokhara suffered minimal damage and no casualties from the earthquake, the increased presence of improved, non-local seed to the neighboring districts may add an additional note of urgency to conservation efforts. Additionally, the limited resources of the most vulnerable tenant and Dalit farmers in earthquake-affected areas may have eroded even further.
The second potentially system-altering event is Nepal’s new constitution, which was promulgated on September 20, 2015. Nepal’s turbulent political history begs the question about whether political stability will hasten development and foster a more inclusive environment. The violent conflict that erupted in the Terai in the fall of 2015 after the passing of the new constitution calls into serious question whether this constitution will bring real change to Nepal’s hinterlands and its more vulnerable populations.

Together, the earthquakes and the new constitution could possibly change the way agricultural aid, programs, and policies affect the populations of Ghanpokhara and other rural areas. Further research is needed to understand how these recent changes affect Nepal’s vanishing local rice varieties and how these two events impact the already large rates of out-migration from the earthquake-affected areas.

**Major Findings**

This study’s examination of intersections of agroecological elements, social structures, and location has implications for agrobiodiversity conservation. While the data for this project reveals that Nepal’s agricultural development disproportionately targets landowners, the systematic exclusion of Dalit tenant farmers from agricultural extension efforts is partly responsible for the continued maintenance of Nepal’s rice diversity in the mid-hills. Redressing this exclusion could bring increased presence of improved and modern varieties into Ghanpokhara’s predominantly traditional paddy production system. This presents what I call a paradox of exclusion, a biophysical benefit to agrobiodiversity conservation that arises at the expense of a highly marginalized group of farmers.
The two cases in this study provided an example of how normative social structures such as caste and land tenure status mapped on to agroecological characteristics such as paddy-productive land, irrigation access, and soil erosion. The socio-spatial hierarchy of agroecological conditions and circumstances has implications for the conservation of Nepal’s in situ rice diversity. My assessment of how and why land tenure and caste affect rice diversity in Ghanpokhara revealed important issues of inequality and access in the paddy production system, and can be used to target future crop conservation efforts. This study identified key intersecting variables that impact landrace conservation:

1. Sharecroppers play a significant role in the paddy production system as a result of the outmigration of more privileged landowners;

2. Caste status of Dalit farmers maps onto their role as sharecropping tenants;

3. Except as tenant sharecroppers, Dalit farmers experience spatial segregation from paddy-productive land;

4. Land owners have better food security compared to their tenant sharecroppers, thus impacting their preference for rice varieties;

5. Sharecroppers, Dalit, and women suffer from great exclusion by government-affiliated agricultural development programs.

These aspects of the land tenure and caste systems contribute to and detract from in situ rice diversity in varying ways. Prior studies (Bellon, 2004; Lenné and Wood, 2011; Zimmer and Douches, 1991) neglected to address distinctions in landholding status as a factor in crop conservation. Diverse farming demographics are usually grouped together as a single entity: small-scale farmers (Bellon, 2004; Lenné and Wood, 2011; Zimmer and Douches, 1991). However, the paddy production system in Ghanpokhara revealed that distinctions among these populations played a role in both varietal preferences and a
farmer’s access to ideal paddy conditions. These key variables establish a baseline of
social-agroecological elements that could help future conservation and development
projects address gaps in policies and programs.

The continued conservation and maintenance of traditional rice varieties depends
on the availability of sharecroppers, their access to land, and their continued motivation
in growing local landraces. Omitting land tenure status and spatial and ecological
differences of access related to productive crop land from crop conservation narratives
stymies conservation efforts.

Discussion

Different demographics have different priorities of use values for their paddy. Whether rice fills their belly for the whole day, cools them off in the heat of summer, feeds their goats or buffalo, fills the plates of their family members, or feeds their guests on auspicious holidays, individual smallholder households value these uses differently at different times. In Nepal, where rice can reflect identity and culture, which rice variety farmers grow and why can reveal much about their farming and social situation as well as about the location where they cultivate.

While previous research argues that small holder subsistence farmers are responsible for a large portion of on-farm conservation (Sthapit, et al., 2008; Bellon, Pham, and Jackson, 1997), this study highlights the important distinction between land owning and sharecropping. Furthermore, it demonstrates that more complex, heterogeneous readings of “smallholders” reveal key differences that could impact agrobiodiversity conservation. The differences in rice preferences between tenant
sharecroppers and land owners impacts Nepal’s ability to conserve its traditional rice varieties.

Between Gurung landowners and Dalit tenant farmers, a wide chasm of economic and educational opportunities exists that reflect differences in mobility. This study found that wealthier Gurung had more family members living out of the household, impacting labor availability. Gurung outmigration and the localized migrations of Dalit sharecroppers seeking paddy fields share a similar desire for improved livelihoods, only one strives for income while the other fights for sustenance. Dalit tenant sharecroppers in this study lacked the financial and network resources that facilitated Gurung outmigration. In this study, wealthier Gurung family members left Ghanpokhara for a variety of reasons: young children attended boarding school; working age men served as migrant labor overseas; or working age men worked in urban centers within Nepal. This outmigration of wealthier subsistence farmers reflects a disparity of available opportunities between different economic classes, even among those living at the subsistence level. The ensuing labor shortage created by this exodus of working-age men from Roplephant and Bhache is not unique to this region (Adhikari and Hobley, 2015).

One way that farmers in this region have coped with the labor shortage is through widespread use of the region’s traditional sharecropping system. This system allows both landowning farmers who are labor poor and tenant farmers who are land poor access to paddy that neither group would have without a sharecropping system. Yet while both groups depend on this system to some extent for their household rice provisioning, because Dalit sharecroppers have little access to off-farm income streams, this system keeps them farming in a near-dependent state just to meet their quotidian subsistence
needs. Sharecroppers in this study provided a valuable source of free labor which helped maintain both paddy production and rice diversity in Ghanpokhara.

Household size directly correlates with both land tenancy and the need for more rice. Differences in household food security and land tenure status clearly affect varietal preferences when it comes to paddy production. Because the social institutions of caste and ethnicity, along with household size, map onto systems of land tenure in Ghanpokhara, existing cultural dynamics perpetuate food insecurity among the region’s most vulnerable populations. Dalit dependency on sharecropping as a means to household food security keeps them (and other sharecroppers) living at a subsistence level. The shift in agricultural stewardship towards tenant farmers (in particular, Dalit farmers), whose larger households coupled with the fact that they give half of their harvest to landowners, necessitate higher yielding varieties. Maintenance of traditional rice diversity will depend on the participation of Dalit and other sharecroppers in conservation efforts. While Bhattarai et al. (2015) found that caste and landholding status have no impact on knowledge of or access to high-yielding, improved rice varieties, this study found that caste and landholding do alter access to improved rice varieties. This emphasizes the urgency of targeting marginalized castes, sharecroppers, and women in conservation efforts.

Despite the predominance of outwardly-mobile Gurung, Dalit farmers have also begun expanding their opportunities for outmigration and income generation abroad. As their livelihoods improve and they find greater agency and choice and expand their network opportunities, sharecroppers will no longer rely on wealthier landlords to meet their sustenance needs. When subsistence levels are met and income levels increase, will
Ghanpokhara’s labor intensive paddy production disappear? Will Ghanpokhara’s traditional rice varieties be relegated to a seed bank?

I posit that sharecroppers fill potential spaces of abandonment and transform them into what David Harvey (2000) would call spaces of hope. I conceptualize spaces of abandonment as complex spaces that arise from a loss of material goods and associated symbolic knowledge. In this instance, farming fields abandoned by Gurung landowners, and the cultural memory and agroecological knowledge associated with specific rice varieties, as well as the programmatic gap where sharecroppers are omitted from development programs in Ghanpokhara all constitute spaces of abandonment. These exclusions reflect a constricting of rice diversity, but they also highlight the important role of Dalit sharecroppers in filling this space of abandonment and the potential of sharecroppers as stewards of these spaces in the future. Without a sharecropping system and the availability of Dalit tenant farmers, abandoned fields in Ghanpokhara would be even more prevalent than they are now and diversity loss would increase with a lack of labor to continue cultivating both farm fields and the cultural and agroecological knowledge associated with specific rice varieties.

Other parts of Nepal, including Lamjung’s neighboring districts of Manang and Mustang, have already experienced agriculture-altering rates of outmigration and the abandonment of traditional agricultural crops. In both Mustang and Manang, programs

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17 The link between culture and memory is more frequently applied to historical studies than to those in agriculture. The use of “memory” and its applicability to connections between culture, society, and politics has been documented (Confino, 1997). In this study I expand the links between culture and memory to encompass traditional crop varieties and the cultural uses of these varieties. Once individual landraces are lost, the memory of their specific cultural uses could also be lost. Collecting oral histories of these uses could be one way to at least document the historic cultural use in an attempt to offset cultural memory loss.
have begun refocusing traditional agricultural systems towards less labor intensive, export-ready apple production. Hiking through the Annapurna mountains in Manang, I witnessed abandoned terraces where farmers once grew naked barley and buckwheat. Speaking in broken Nepali, I asked an older Gurung woman selling snacks to tourists on the side of the trail what had become of the farming there. She said that people had left farming for work in tourism. Additionally, the donkeys which carry provisions for trekking tea houses continuously ate farmers’ crops. Reflected in Manang’s beautifully steep and rugged terrain, I saw the future of Ghanpokhara’s agricultural system. But in lieu of Manang’s newly planted apple orchards, ACAP and DADO would transition Lamjung’s hillier areas to coffee, tea, and black cardamom (elaichi)—products which they have already begun promoting in various areas of Lamjung’s hills.

The loss of Ghanpokhara’s traditional rice varieties will reflect broader agricultural system changes. Younger generations in Ghanpokhara desire better education and services and don’t feel the same tie to the land or yearn for the taste of the place’s traditional rice varieties to the extent that older farmers do. Working-age residents also justifiably recognize the need for an income that they don’t envision coming from the current subsistence paddy production system. The potential loss of cultural memory associated with varieties such as Anga used to cool the body, Anadi used to make toasted rice snacks, and Gaure and Jhinuwa used to feed guests and family on auspicious days and holidays can not be recaptured once gone.

Using rice diversity as a lens to examine social and agroecological inequalities, this study revealed that development efforts reinforce preexisting social and material inequalities rooted in a farmer’s social and physical location within the landscape. The
social and spatial hierarchy of development efforts and the paradox of exclusion benefits
the conservation of traditional rice varieties. The shift in agricultural stewardship towards
tenant farmers (and Dalit farmers in particular) means agricultural biodiversity
conservation efforts must focus on inclusive programs that target sharecroppers.

Protecting and promoting the farmers who continue to steward the valuable
 genetic and cultural resources of these rice varieties is imperative. Denying the crucial
role of the highly marginalized sharecroppers who grow rice for the households of
Bhache and Roplephant hastens the dwindling diversity of Ghanpokhara’s rice. Given the
large outmigration of Gurung youth along with the glacial rate of development in
Ghanpokhara, tenant sharecroppers will likely play increasingly important roles in not
only paddy production and the maintenance of on-farm rice diversity, but also in the
broader agricultural stewardship of the VDC.

Redressing the inequality of agricultural development programs, which target
only land owners, would help stabilize the paddy production system and promote a more
equitable approach to agricultural development. Reorienting agricultural development
schemes and conservation programs to include sharecroppers would not only create a
more inclusive agricultural system, it would also contribute to a more sustainable and
enduring agricultural landscape.

A Need for Land Reforms

On a broader level, to successfully ensure both poverty alleviation and
development in its rural agricultural systems, Nepal must shift toward more inclusive
programs, and, more radically, must enact and enforce land reforms regarding tenant
farming. Such land reforms have been called for in similar tenant systems in other
developing countries since before 1945 (Binswanger, Deininger, and Feder, 1993). While Nepali land reforms of 1951, 1964, and 1996 in fact codified more egalitarian land ownership, low levels of education coupled with the high levels of bureaucracy involved in advocating for one’s land rights, make these land reforms ineffectual (Crowley Program, 2011). Greater awareness of these reforms as well as their enforcement could provide greater long-term stability by giving sharecropping tenants ownership or partial ownership in land parcels cultivated over a certain length of time. Because landless Dalit don’t have the resources to purchase land from land owners and land owners have the ability to manipulate the tenant registration system (Crowley Program, 2011), another alternative could shift land away from landowners and place it in a community trust that offers the land to long term residents without resources to purchase the land themselves. Regardless, land reform system must be simplified so that landless tenants can have a vested interest in the land they farm. Less precarity in land tenure among sharecroppers could foster greater inclusion in development projects, more long-term sustainability in farming practices, and greater conservation of rice diversity through greater access to the quantity of harvested paddy.

**Conclusion**

This study has revealed nuanced relationships between labor, land, and rice diversity. The intersections of these dimensions of paddy farming affect not only what it means to grow rice, but also what it means to eat rice. In asking “Who grows rice, for whom, and why?” this study questions the premise of conservation efforts and posits a revision of who stewards crop diversity. Understanding why rice varieties have value and to whom is key. Is the value of a traditional rice variety its cultural importance, its
ecological significance, or its abundant yield? Who decides which factor matters most?
The very premise of crop conservation is complicated by an overwhelming need of subsistence farmers to eat. Conservation of traditional varieties depends on both the desire and the need for specific varieties and their unique attributes. This study’s rigorous approach to examining the complex intersections of agroecological conditions, social structures, and location in the traditional paddy production system of Ghanpokhara highlights the need for further studies on the role of sharecroppers in crop diversity maintenance and in agricultural landscape management.
REFERENCES


APPENDIX 1: RICE VARIETIES GROWN BY STUDY PARTICIPANT HOUSEHOLDS

### Households

<table>
<thead>
<tr>
<th>Rice Variety</th>
<th>Bhache Gurung</th>
<th>Dalit</th>
<th>Roplephant Gurung</th>
<th>Dalit</th>
<th>Brahmin</th>
<th>Total Gurung &amp; Brahmin</th>
<th>Total Dalit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anadi</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>8</td>
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<td>Basmati**</td>
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<td>0</td>
<td>2</td>
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<td>0</td>
<td>2</td>
<td>0</td>
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<td>0</td>
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<td>0</td>
<td>2</td>
<td>1</td>
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<td>2</td>
<td>1</td>
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<tr>
<td>Dalle</td>
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<td>7</td>
<td>2</td>
<td>1</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Darmali</td>
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<td>0</td>
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<td>Jhiniwa/Kalo Jhiniwa</td>
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<td>1</td>
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<td>0</td>
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<td>Kartike Marsi</td>
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<td>4</td>
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<td>Manchara/Mansara</td>
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<tr>
<td>Piaile</td>
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<td>3</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Pokorelli/Pokhrelli</td>
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<td>1</td>
<td>4</td>
<td>2</td>
<td>0</td>
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<td>3</td>
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<td>Pomali</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Radha-7*</td>
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<td>4</td>
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<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Thulo Marsi</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

*modern rice varieties
**both local and hybrid varieties

### Total rice varieties grown by farmers in Bhache (Ward 1) and Roplephant (Ward 5)

<table>
<thead>
<tr>
<th></th>
<th>Total Varieties Grown by Farmers Interviewed</th>
<th>Total varieties grown by Gurung living in Bhache</th>
<th>Total varieties grown by Dalit living in Bhache</th>
<th>Total varieties grown by Gurung in Roplephant</th>
<th>Total varieties grown by Dalit in Roplephant</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25</td>
<td>12</td>
<td>13</td>
<td>20</td>
<td>6</td>
</tr>
</tbody>
</table>

18 Does not indicate location of paddy production, only of where the participants who grow these varieties were living at time of interview.
APPENDIX 2: QUALITIES OF RICE AS MENTIONED BY PARTICIPANTS IN GHANPOKHARA VDC

<table>
<thead>
<tr>
<th>Rice Variety</th>
<th>Characteristics of Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Akle</td>
<td>Good quality, tastes good, smells good, small grain, good productivity.</td>
</tr>
<tr>
<td>Anadi</td>
<td>Good yield, eat as a snack (latte, katte) not for cooked rice. Not grown by everyone consumed in other forms of food, even send to US, UK</td>
</tr>
<tr>
<td>Ang</td>
<td>grows on dry land, less water. It ripens quickly, chamal is red, not good yield. Ok taste. It's not good if you have a cold. It causes cold in the body. They use it to make chang in this (spring) season. Because it causes cold, they prepare chang in hot season and drink it to cool off.</td>
</tr>
<tr>
<td>(local) Basmati</td>
<td>They don't grow much here.</td>
</tr>
<tr>
<td>Briamphul</td>
<td>Trying to grow first time here; imported by Li-Bird from Kaski.</td>
</tr>
<tr>
<td>Chotte dhan</td>
<td>Very old dhan, native. OK yield, same land type as Gaure/Jhinuwa. Taste is ok+.</td>
</tr>
<tr>
<td>Chhomrong</td>
<td>new dhan, grows in high altitude; doesn't know</td>
</tr>
<tr>
<td>Dalle</td>
<td>When you cook it, it fluffs up (~Chotte, Piale) more high yield in the good/right environment, perfect condition (but same as other varieties, but Dalle more so)</td>
</tr>
<tr>
<td>Darmalli</td>
<td>native; nice, ok production, grows in same environment as Dalle and Gaure. Good.</td>
</tr>
<tr>
<td>Gaure</td>
<td>Like Basmati (with Jhinuwa) good yield; more recent than Jhinuwa, high class people have Gaure and Jhinuwa, well irrigated need proper care (fertilizer) &lt; 1100m</td>
</tr>
<tr>
<td>Variety</td>
<td>Notes</td>
</tr>
<tr>
<td>------------------</td>
<td>---------------------------------------------------------</td>
</tr>
<tr>
<td>Gorkhali</td>
<td>from Gorkha; actual name is Indraveli; doesn't know but his neighbors say it is doing well</td>
</tr>
<tr>
<td>Himali dhan</td>
<td>Very few people grow; was imported from KTM (bikase?)</td>
</tr>
<tr>
<td>Jau dhan</td>
<td>Native; very old variety; grows in moderate land not too dry, not too wet. Good yield. Ok taste. Tastes similar to Mansuli, size is similar to Gaure. Not that aromatic but taste is good.</td>
</tr>
<tr>
<td>Jhinuwa</td>
<td>Native; more aromatic than Gaure but taste is similar; have been growing from ancient times. Low yield compared to Gaure; well irrigated soil. &lt;1100m</td>
</tr>
<tr>
<td>Kalo dhan</td>
<td>similar to Dalle; husk is black</td>
</tr>
<tr>
<td>Kalo Jhinuwa</td>
<td>very good taste, like Gaure</td>
</tr>
<tr>
<td>Kalo Pasgaule</td>
<td>from Pasgau; doesn't taste good. Grows well, yields well, but they don't like it.</td>
</tr>
<tr>
<td>Kalo Phalame</td>
<td>High altitude &gt;1100m</td>
</tr>
<tr>
<td>Kattike</td>
<td>native; very old variety; ripens early, in Kartike month; it produces in shade and produces ok in shade too (not in shade?); taste is ok.</td>
</tr>
<tr>
<td>Khumal-4</td>
<td>This &amp; Khumaltar, Radha-7: Nepal Ag departement.</td>
</tr>
<tr>
<td>Khumaltar</td>
<td>modern; good taste;</td>
</tr>
<tr>
<td>Radha-7</td>
<td>grows in medium soil, not too much water; not as tasty</td>
</tr>
<tr>
<td>Lama Gaun(le?)</td>
<td>don't know, maybe from Lama gaun</td>
</tr>
<tr>
<td>Lekali Basmati</td>
<td>? Tastes good; good dhan grows 1100-1500m; at that height this is considered good dhan</td>
</tr>
<tr>
<td>Lekali rato dhan</td>
<td>grows &gt;1100-1200m; ok/good production, taste.</td>
</tr>
<tr>
<td>Machhapuchre-3</td>
<td>not local, ACAP brought. High altitude 1100-1500m</td>
</tr>
<tr>
<td>Variety</td>
<td>Description</td>
</tr>
<tr>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Manshara</td>
<td>Native; very old; ok taste, not high starch, doesn't stick when cooked, hard to eat for older people (because doesn't stick), but young people like it. It grows in dry land like Anga dhan.</td>
</tr>
<tr>
<td>Naule</td>
<td>Same as Dalle</td>
</tr>
<tr>
<td>Piale/Pahanle (yellow)</td>
<td>Native; old; grains are bigger; it grows &gt;1100m; tastes good; for beaten rice (because of bigger grains);</td>
</tr>
<tr>
<td>Pomale/Pumale</td>
<td>Native/Very old; lower land; well irrigated; yield is good; taste is ok/good</td>
</tr>
<tr>
<td>Rato Anadi</td>
<td>Husk is red, it's not called Rato Anadi, just Anadi, not everyone grows; it's not grown as food for rice, just grown as snacks on small land.</td>
</tr>
<tr>
<td>Tamare</td>
<td>Very old; native; 2 types: Seto &amp; Rato. Neither taste good; plant in 2 ways: dry highlands they sow it and don't plant it. Some do plant it normally. Now it's replaced by other varieties, doesn't taste good. It's almost extinct. Plow then sow. /You plant or sow, very high altitude; they tried it here (in Bhache) but it didn't yield well. It's from Bhujung.</td>
</tr>
</tbody>
</table>
### APPENDIX 3: NEPALI WORDS AND PHRASES

<table>
<thead>
<tr>
<th>Nepali Term</th>
<th>English Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aama samuha</td>
<td>Mothers’ group</td>
</tr>
<tr>
<td>Bari</td>
<td>Rainfed upland field</td>
</tr>
<tr>
<td>Bhat</td>
<td>Cooked rice</td>
</tr>
<tr>
<td>Bika</td>
<td>Short for Bishwokarma, a Dalit last name</td>
</tr>
<tr>
<td>Chamal</td>
<td>Uncooked, milled rice</td>
</tr>
<tr>
<td>Chang</td>
<td>Rice beer</td>
</tr>
<tr>
<td>Chiura</td>
<td>Beaten rice</td>
</tr>
<tr>
<td>Dahi</td>
<td>Yoghurt</td>
</tr>
<tr>
<td>Dai</td>
<td>Older brother</td>
</tr>
<tr>
<td>Dal</td>
<td>A soup-like preparation of pulses (usually lentils) that accompany rice in a typical Nepali meal</td>
</tr>
<tr>
<td>Dal bhat</td>
<td>Traditional and typical meal in much of Nepal, consisting of a large plate of rice with dal, cooked greens, and a small amount of spicy sauce. Variations on what accompanies the dal and rice vary by location and by household</td>
</tr>
<tr>
<td>Dhan</td>
<td>Paddy</td>
</tr>
<tr>
<td>Fagun-Chaitra</td>
<td>Nepali months, March.</td>
</tr>
<tr>
<td>Hal</td>
<td>The amount of land that can be worked with a plough in one day</td>
</tr>
<tr>
<td>Janajati</td>
<td>Ethnic people</td>
</tr>
<tr>
<td>Ke garne?</td>
<td>What to do? An expression of inevitable acquiescence to fate</td>
</tr>
<tr>
<td>Khana khanu bhayo?</td>
<td>Have you eaten?</td>
</tr>
<tr>
<td>Khet</td>
<td>Irrigated lowland field</td>
</tr>
<tr>
<td>Kodo</td>
<td>Finger millet</td>
</tr>
<tr>
<td>Mana</td>
<td>Unit of volume measure</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Muri</td>
<td>Unit of volume measure, one muri is roughly equivalent to 20 pathi, or 52.5 kg paddy</td>
</tr>
<tr>
<td>Nagarpolika</td>
<td>Municipality</td>
</tr>
<tr>
<td>Pathi</td>
<td>Unit of volume measure, one pathi is roughly equivalent to 8 mana, or 8 kg of paddy</td>
</tr>
<tr>
<td>Raksi</td>
<td>Distilled grain alcohol; in Ghanpokhara it is usually made from a combination of finger millet and corn</td>
</tr>
<tr>
<td>Ropain</td>
<td>National Paddy Day on the 15\textsuperscript{th} of Ashad (June 29\textsuperscript{th})</td>
</tr>
<tr>
<td>Ropani</td>
<td>Unit of land; one hectare = 19.66 ropani</td>
</tr>
<tr>
<td>Suaahara</td>
<td>Good nutrition; also the name of a USAID funded nutrition program focusing on pregnant women and children under two years of age</td>
</tr>
</tbody>
</table>
APPENDIX 4: IRB APPROVAL MEMO

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2307
515 294-4566
FAX 515 294-4267

Date: 7/3/2014
To: Marie Louise Ryan
916 Northwestern Ave
Ames, IA 50010
CC: Dr. Francis Owusu
156 College of Design
Dr. Carmen Bain
308 East Hall

From: Office for Responsible Research
Title: Growing Rice to Market: Gender & Crop Diversity in Nepal
IRB ID: 14-315

Approval Date: 7/3/2014
Date for Continuing Review: 6/30/2016
Submission Type: New
Review Type: Full Committee

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- Use only the approved study materials in your research, including the recruitment materials and informed consent documents that have the IRB approval stamp.
- Retain signed informed consent documents for 3 years after the close of the study, when documented consent is required.
- Obtain IRB approval prior to implementing any changes to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- Immediately inform the IRB of (1) all serious and/or unexpected adverse experiences involving risks to subjects or others; and (2) any other unanticipated problems involving risks to subjects or others.
- Stop all research activity if IRB approval lapses, unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- Complete a new continuing review form at least three to four weeks prior to the date for continuing review as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. Approval from other entities may also be
needed. For example, access to data from private records (e.g., student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. IRB approval in no way implies or guarantees that permission from these other entities will be granted.

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 113B Pearson Hall, to officially close the project.

Please don’t hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.