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The Role of Gender and Caste in Climate Adaptation Strategies in Nepal

Emerging Change and Persistent Inequalities in the Far-Western Region

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Despite the growing number of studies and research projects on climate change adaptation, only a few have examined the gender and cultural dynamics of the adaptation process. Inequality has been identified as a major indicator of the vulnerability of individuals and groups; nevertheless, the gender and cultural aspects of inequality have not received much emphasis. The present article attempts to analyze the influence of gender and cultural relations on the process of climate change adaptation by presenting a study of Dalit and Lama households in the mountainous Humla District of Nepal. The inhabitants of Humla have been experiencing a shift in the monsoon season, a decrease in snowfall, and longer dry periods, with adverse effects on their livelihoods. The main focus of this article is to highlight the cultural, social, and economic dependency of the Lama and Dalit ethnic groups and to examine whether processes of adaptation exacerbate or alter gender inequalities and intercaste dependencies.

Keywords: *Climate change; adaptation; gender; caste; Dalit; Humla; Nepal.*

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Introduction

Adaptation to climate change has drawn significant attention in recent years due to the need to ensure that affected populations are reasonably able to cope and adequately live with degrees and forms of climate variability. Results of recent studies have brought new insight into the understanding of factors that shape and affect the capacity of people to adapt. Such factors are not limited to biophysical and economic conditions but also include the social characteristics of communities (Nielsen and Reenberg 2010). These studies demonstrate that gender and other forms of social differentiation and stratification pose obstacles to adaptive capacity and decision-making (Brooks 2003; Adger et al 2007; Garg et al 2007; Adger et al 2009; Nightingale 2009). In Nepal, sociocultural practices, such as patron–client relations, in the form of tenancy relations have been integral to agricultural production (Fortier 1993). In the *adhiya* system in particular, higher caste members (Bahun, Chhetri, Thakuri, Lama), with large landholdings, allow Dalits (the untouchable caste) to cultivate their land in exchange for 50% of the yield (Fortier 1993). This article examines the patronage relations between Lamas and Dalits in agriculture in the context of a changing climate and whether processes of adaptation exacerbate or alter gender inequalities and intercaste dependencies. It is important to note that even though the Lama ethnic group belongs not to the Hindu caste system but to the Bhutiya indigenous group, they still practice some of the customs and cultures of the Hindu caste; according to NEFIN (2005),

> *Bhutias are those people who do not belong to any of the particular or distinct stocks of indigenous people of the Nepal Himalaya. They resemble Tibetans in most of their ways of living. However, their statistics are not yet properly maintained. Trade and animal husbandry are the main occupations of the Bhutias.*

The role of social relations in climate change adaptation

The growing literature on climate change adaptation and disaster risk response increasingly recognizes that the effects of hazards and climate change are socially differentiated (Blaikie et al 1994; Ray-Bennett 2009). What is less explored, however, is how social relations shape climate change adaptation. Adaptation is about how people respond to and live with their increased exposure to climate-related risks and stresses on their livelihoods. People draw upon available physical, economic, political, and cultural resources, including their social relations. Adaptation processes involve the interdependence of agents through their relationships with each other, with the institutions in which they reside, and with the resource base on which they depend (Adger 2003: 388).

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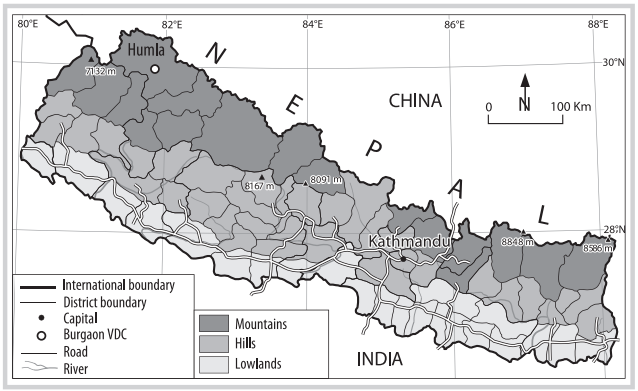
People adapt by reworking or sustaining relations that allow them to improve or optimize their livelihoods, or aspects of these, under conditions of change in the best ways possible. Jones (2010) further suggests that social barriers influence an individual's adaptive capacity and circumscribe behavior and entitlement, and also contribute to maladaptation.

Pelling and High (2005) tell us that people "bond, bridge or link" to establish ties that enable them to adapt to the impacts of climate change. In unequal patron–client relationships, such as intercaste relationships in Nepal, lower-caste people can leverage resources from the caste hierarchy through gendered ways and means. These vertical ties and relationships are subject to exploitative practices and deepen dependencies, especially prevalent in interethnic relations and gender relations (Pelling and High 2005; Nightingale 2009; Jones 2010). Adaptation as a social process, however, is dynamic, and opportunities for change emerge (Resurreccion et al 2008; Smit et al 2009). Particular hierarchical social relations may be susceptible to change, whereas others may prove more resilient. The study by Folmar (2007) on the Dalits of western Nepal, for instance, highlights the fluidity of lower caste identity, showing the mismatch between their popular representations of Dalit "impurity" and their wide latitude for crossing caste boundaries in practice. In contrast, the study by Ray-Bennett (2009) of different Indian castes during multiple disasters shows that gender boundaries often remain intact and resilient to change even under the worst conditions of flooding and cyclones. It, therefore, appears that adaptation to climate change is a dynamic process, bringing into being new caste positions and relations, while possibly keeping some gender norms intact and deepening intercaste and gender relations.

Methodology and research context

The present article is part of a larger study, conducted from June to December 2009, that used a qualitative approach devoted to describing how individuals adapted to climate change in ways that challenged and simultaneously re-entrenched gender and caste norms and practices. The qualitative methodology was used to make sense of a specific phenomenon and to capture meanings attached to behavior, actions, decisions, and values to chart the mental processes that lend support to them (Ritchie and Lewis 2003). The intent was to understand the complexity of gender and caste interactions by focusing on the rich social context or setting of the phenomenon (Creswell 2007) to generate insights into adaptation to climate change. We define adaptation as a complex process of sociocultural dynamics largely attributed to the workings of gender and caste, which, therefore, does not require findings that can be generalized to apply to the entire population under study. Interviews, group discussions, and participant observation were used to collect the data. The research analyzed the thick description of narrative accounts that shed light on how people adapted to a dwindling climate-affected resource base while simultaneously negotiating gender and caste restrictions. The study makes use of interviews with 18 individuals who shared their experiences of climate change adaptation and related sociocultural tensions.

FIGURE 1 Location of Humla District and Burgaon VDC. (Adapted from a map by Andreas Brodbeck, published in *MRD* in 2004)



Burgaon village, Humla District, Nepal

Humla district is located between 29°35′ and 30°70′N; 81°18′ and 82°10′E longitude, and covers an area of 6134 km^2 (DDC 2010). Humla district lies in the Karnali Zone of the Mid-Western Development Region in Nepal, with elevation that ranges from 1219 to 7337 m (Figure 1).

Development indicators rank Humla 70th among 75 districts (UNDP 2009). The study area was Burgaon village in Burgaon village development committee (VDC) (Table 1). The Dalits are the poorest group in Humla, accounting for approximately 13% of the total population (OCHA 2008). They own little agricultural land and are not allowed to share drinking water or cooked food, or to participate in communal events. All 11 Dalit households in Burgaon have sharecropping arrangements (*adhiya*) with Lama households. Lamas also hire Dalit women and men for livestock grazing and for transporting goods, for which they are paid in cash, grain, oil, and other household items.

Effects of climate change on livelihoods

Humla district is highly elevated, with significant landscape diversity, resulting in different microclimatic conditions. Meteorological data are not available at the scale of the research site; hence, we relied on the experiences and observations of the villagers. Although the climate at low altitude next to the larger rivers is warm enough to grow paddy and maize, the mountains that surround the whole district are snow covered throughout the year. Maximum temperature ranges from 10 to 25°C, whereas the minimum is from −10 to −18°C

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TABLE 1 Burgaon VDC and Burgaon village.

Burgaon VDC	
Total households	144
Total population	1230: 551 women and 679 men
Distance from Simkot (district headquarters)	22.5 km
Total agricultural land	501 ha (not irrigated)
Grazing area	1000 ha
Burgaon village	
Altitude	3000 masl
Total households	65 (54 Lama households, 11 Dalit)
Major livelihood	Agriculture, trading goods from Nepal China border and manual labor

Sources: CBS 2002, DAO 2006, DDC 2010.

(DDC 2010). Temperatures at higher altitudes are increasing at a higher rate than in the lower regions in Nepal, which indicates that the mountainous regions are more sensitive to climatic change (Shrestha et al 1999; Agrawala et al 2003).

One study that analyzed maximum temperature data from 49 stations in Nepal from 1971 to 1994 showed that the average maximum temperature is increasing at the rate of approximately 0.068 to 0.128°C per year (Shrestha et al 1999). Recent data from 27 meteorological stations show that the average trend of maximum temperature increase is 0.041°C and 0.027°C per decade (Sharma 2009). The global average rate is 0.017°C per decade; hence, the increase in Nepal is significant. The average precipitation in Nepal is 1768 mm (Shrestha et al 2000), and it has been projected that, by 2030 and 2100, winter precipitation will change from 0.8% to 2.1%, and summer precipitation will change from 9.1% to 22.9% (Agrawala et al 2003). The disparity in the change between summer and winter precipitation has significant effects on agriculture and could trigger floods and landslides.

All agricultural land in Burgaon is rainfed, and villagers have no other option but to adapt to changing rainfall patterns. Respondents perceived that the onset of the monsoon shifted from *Ashad* (June–July) to *Bhadau* (August–September), and the end of the monsoon shifted from *Bhadau* (August–September) almost to *Kartik* (October–November). Lama men said that they were often uncertain of the onset and end of monsoon. Dry seasons also are changing. Respondents said that the dry periods used to be in *Ashoj* (September–October) and *Kartik* (October–November), when their crops would be ready for harvest. However, in the past decade, they witnessed drier periods during the traditional planting season from *Jeth* (May–June) to *Shrawan* (July–August). Snowfall also is a crucial climatic event for the agriculture of Humla. One of the key informants, Jay Bahadur Rokaya, a Kantipur reporter based in Simkot, highlighted that snow not only adds to soil moisture but also assists in the decomposition of plants, which helps to enrich the soil. This testimony corroborates scientific findings that show that snow plays a major role in litter decomposition and nitrogen release (Groffman et al 2001; Baptist et al 2010). Historically, it snowed from *Mangsir* (November–December) to *Baisakh* (April–May), but respondents in the group discussions expressed that it is now difficult to see any snow during these months. A 71-year-old Lama man explained that, about 25–30 years ago, snowfall completely covered their 3-story houses, where they remained stranded for months. A Lama woman said that, about 15 years ago, when she traveled to Simkot, the district headquarters, in the winter months, she had to trudge through waist-high snow. Respondents have not seen snow more than a foot high, if that, for 15 years.

Villagers said that shifts in the climate have created a marked decrease in yields of *gahu* (wheat), *uwa* (naked barley), *chino* (panicum millet), and *fapar* (buckwheat). In Humla, *chino* (panicum millet) significantly decreased, from 231 tons in 2001 to 193 tons in 2008, despite an increase of 5 ha of land for cultivation (DAO 2008). Agriculture production usually is low due to the harsh conditions in Humla, but as one Dalit male farmer explained:

> *We have experienced drought before but now it is happening almost every year. In the past, we at least had some grain stored from better yield years and got by with this. But these past few years the yield has been consistently poor. I do not know how we are going to survive the coming winter.*

Lama respondents also said that they were not able to hire Dalit men and women because they had less grain to pay them.

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Climate change adaptation strategies: relations of dependency in farming and trade

Dalit households in Burgaon village are growing more drought-resistant crops and exploring new opportunities to earn cash income to purchase food. Both Lama and Dalit women are primarily responsible for agriculture, and Lama and Dalit men participate in planting and harvesting. Due to warmer temperature and decreasing rainfall, Dalit men emphasized that they have begun to grow 2 crops of *fapar* (buckwheat) per year because it is highly drought resistant. Traditionally, they used to grow *fapar* only once during the dry season, when most of their fields are left fallow. Remarked Bachu Kami, 35, a Dalit woman:

> *We do not own any land, so we have taken 2 ropani of adhiya (sharecropped) land from a Lama family. We mostly grow gahu (wheat), uwa (naked barley), chino (panicum millet), kodo (finger millet), alu (potato), simi (green beans), and fapar (buckwheat). We used to harvest about 20 kg of gahu but now not even 10 kg. We used to have enough food for at least 5–6 months but now I have to buy or ask for food after that period. So, due to the decrease in gahu and rainfall, we are planting fapar more than once a year.*

Sanma Sunar, a 29-year-old Dalit man, said:

> *Because the adhiya land is fallow due to a longer dry period and the uncertain rain, fapar is the only crop that grows well in the dry season.*

Dalits are thus using their traditional knowledge to enhance their adaptive capacity. The accounts also indicate the dependence of Dalits on Lama households, because they mainly grow *fapar* on *adhiya* land, which they lease from Lama households and with whom they have to divide half of the land's yield. Due to the declining precipitation throughout the year, *fapar* has become the survival crop for Dalit households and is now the most consumed grain in the Dalit households in Burgaon. Of the total of 11 Dalit households in Burgaon, 10 households claimed to grow more *fapar*. Only 1 household did not have enough land for cultivation. This adaptation strategy reinforces the Dalits' traditional dependence on the land leased out to them by the Lama households (*adhiya*). Without this tenure arrangement, Dalits will be unable to adapt to their growing food insecurity due to the changing climate.

Interviews revealed that Dalit men primarily decided to plant *fapar*, whereas Dalit women shouldered the burden of most other agricultural tasks. Planting *fapar* is an additional responsibility for women who would otherwise engage in day labor to service Lama households. They also mobilized their daughters for reproductive and agricultural work, which prevented them from going to school (Figure 2). Thus, the adaptive strategy of planting drought-resistant crops such as *fapar* reinforced gendered patterns of agricultural work, because women assumed a disproportionate share of farm production and household reproduction. The resilience of these gender practices shapes adaptive strategies and tends to maintain, if not exacerbate, the disadvantaged position of the women farmers under study.

FIGURE 2 Dalit and Lama women, men, and a child involved in land preparation in Burgaon village. (Photo by Nisha Onta)



The decrease in crop yields due to the warming effects of climate change has compelled Dalit women to capitalize on their day labor services. Banchu Sunar, 25, helps Lama landlords with preparing land, harvesting, weeding, and fetching firewood and fodder. She is paid in the form of grains, salt, chili, and other household items. Whenever she needed grain or other items, she asked for them from the Lama woman for whom she works as hired labor. Banchu has never traveled elsewhere for day labor, whereas her husband travels to Simkot for day labor as a mason. Her 2 daughters, 9 and 12 years old, help with household chores but, until recently, were not involved in day labor for Lama households. Due to longer dry spells and decreasing crop yields, her older daughter has stopped going to school and has been involved in day labor with her. The story of Banchu resonates with the experiences of most Dalit women in Burgaon, who depend greatly on Lama households for food security and in critical times deepen their reliance on traditional caste relations based on patronage. Dalit women's climate adaptation strategies thus have become more heavily defined by such relations.

Lower crop yields and food insecurity have pressured mountain villagers to explore cash-generating activities such as trade and day labor to purchase food for survival. One of the most sought-after crops in Humla is rice. Rice is not locally produced and became a staple only after the introduction of government food aid in 1972 (Adhikari 2008). A government food assistance program provides

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subsidized rice to all VDC in Humla, where each VDC is allotted a monthly rice supply. Lama households are traditionally engaged in the trade of commodities such as flour and salt at the Nepal–China border. Lama men traveled to the border more often now due to lower agricultural yields. Some Lama men have doubled their number of trips, from 3 to 6. No Lama woman in Burgaon has traveled to the Nepal–China border. Dalit men also travel to Simkot, the district headquarters, to find work as masons or porters. All the men from the 11 Dalit households in Burgaon have traveled to Simkot for work.

Although Dalit men travel to Simkot for day labor, they did not engage in cross-border trade. Dalit men expressed their lack of knowledge about traveling to the border and their lack of sufficient capital to cover the expenses of trading. They also did not own horses, mules, or sheep, which are traditionally used by Lama men for transporting goods from the border. Thus, to engage in trade, Dalit men had no other recourse but to travel with the Lama caravan. However, the cultural barriers between Lamas and Dalits, especially sharing food and water, have prevented Dalits from traveling with Lamas. The caravan carries all food and water supplies, and Dalits are not allowed to touch any food that higher-caste fellow travelers consume. Thus, Lama men did not take Dalit men along with them on these trips, largely because of caste issues of impurity. Dalit male respondents said that they would have to learn from the Lama men and use the business and personal connections of Lama men to make money and to engage in trade at the border. Despite these cultural barriers and financial constraints, a few Dalit men have, nevertheless, ventured into cross border trade.

One of them is Dhana Sunara, 32, with 5 children. He has traveled twice to the Nepal–China border. He explained that, due to the decrease in yield in his *adhiya* fields and with no food to feed his family, despite caste restrictions, he negotiated a very small daily wage with his Lama neighbor and begged him to take him along the trade route. He went with a caravan of 3 Lama households on his first trip. He took care of the mules and he carried his ration of food and utensils by himself, because he was not allowed to eat together with the Lama men. Dhana said that the trek was not difficult but that the nights were very cold and he did not have proper clothes. When they reached the border, he was amazed by Tibet's good roads and bright lights, and he was intimidated by a new place and new people. He helped his Lama neighbor to purchase cement for transport to Simkot. He was paid NPRs 200 (approximately US$ 3.00) per day. He explained that he would have to purchase mules or other livestock to travel on his own and hopes to travel to the border 1 more time before winter to purchase food for his family.

As with Dhana, 3 other Dalit men traveled with the Lamas' trade caravans to the Nepal–China border but were still dependent on the knowledge of the trek and of trade, and on the willingness of Lama men to take them. Cross-border trade has emerged as a major adaptive strategy; interviews with Dalit men centered on their lack of financial, cultural, and social capital to realize this strategy by themselves. Cross-border trade may gradually alter caste norms and practices in the region, but the Dalit men presently remain largely dependent on their patronage relations with Lama men to be able to engage in this occupation.

The above narratives show how adaptation processes are also gendering processes, where particular activities gradually materialize into appropriate roles for women and men. The discussions also made clear that the men are gradually evolving in their identities as itinerant traders beyond their villages, whereas the women's major responsibilities remained home and farm bound.

Conclusion

Humla district is one of the poorest and most underdeveloped regions of Nepal, with no road linkages and very limited natural and financial resources. Due to their isolation, people in Humla draw on human capital from their social relations to adapt to experienced changes in the regional climate. All respondents were very aware of the climate changes occurring in their lives and livelihoods: reduced crop yields, diminishing grazing lands, and a decrease in snowfall, which leads to a decrease in yields and longer dry seasons. The Dalit households of Burgaon village are adapting by planting *fapar* (buckwheat) twice a year, intensifying their trade linkages, and exploring day labor opportunities in the district center, Simkot. Dalit men are beginning to travel with Lama men to the Nepal–China border for business, which could potentially relax caste-related barriers between Lama and Dalit men. Dalit women, for their part, have continued to seek more day-labor employment within the village to receive in-kind compensation for their services.

Overall, despite these variegated strategies, Dalit women and men chiefly harness their traditional relationships of dependency with Lamas. This dependency and interconnectedness defines adaptation strategies, especially in view of growing food insecurity due to diminished crop yields under conditions of a warming climate. This study, accordingly, has drawn attention to gender and caste intersections specific to adapting to climate change, providing new evidence of possibly unintended change and opportunities, simultaneously with resilient caste and gender practices. Dalit men have been able to use patron–client relationships of labor reciprocity with Lama households, and Dalit women are making use of the entitlements associated with their hierarchical relationships with land-owning Lama families to secure their livelihoods. This microlevel study reiterates the findings by Folmar (2007) that Dalits are pushing the caste boundaries, while at the

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same time corroborating the findings by Ray-Bennett (2009), which indicate the resilience of gender boundaries even during crisis.

The explosion of studies on climate change adaptation has offered multiple and rich insights into the social dynamics of adaptation. This article attempted to add a further dimension in studies of vulnerability and adaptation: gendered and caste-related relations of dependency shape, enable, and constrain adaptive capacities. Relations between various social groups co-emerge and re-emerge, shape, and influence mutual adaptive capacity. Dependency relations in rural societies are useful for advancing our understanding of adaptation and vulnerability, and a focus on power-laden social structures such as dependency, caste- and gender-unequal relations can potentially craft more holistic adaptive responses that tap into opportunities to improve the wellbeing of vulnerable peoples.

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