# Mountain Livelihoods in Transition: Constraints and Opportunities in Kinnaur, Western Himalaya

By

Aghaghia Rahimzadeh

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Committee in charge:

Professor Louise P. Fortmann, Chair
Professor Nancy Lee Peluso
Professor Isha Ray
Professor Carolyn Finney

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## Abstract

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This dissertation investigates the transformation of the district of Kinnaur in the state of Himachal Pradesh in the Indian Himalaya. I examine Kinnauri adaptation to political, economic, environmental, and social events of the last seven decades, including state intervention, market integration, and climate change. Broadly, I examine drivers of change in Kinnaur, and the implications of these changes on social, cultural, political, and environmental dynamics of the district. Based on findings from 11 months of ethnographic field work, I argue that Kinnaur's transformation and current economic prosperity have been chiefly induced by outside forces, creating a temporary landscape of opportunity.

State-led interventions including land reform and a push to supplement subsistence agriculture with commercial horticulture initiated a significant agrarian transition beginning with India's Independence. I provide detailed examination of the Nautor Land Rules of 1968 and the 1972 Himachel Pradesh Ceiling of Land Holding Act, and their repercussion on land allocation to landless Kinnauris. My findings suggest that despite the initial inequitable allocation of land under these reforms, 40 years after they were enacted, landless Kinnauris have predominantly become landowners. I illustrate how other socio-economic measures, including the construction of National Highway 22 through Kinnaur, access to wage labor, provision of government jobs and government promotion of commercial apple production, all converged to change the socio-economic condition of Kinnauris and better enable them to take advantage of state land programs.

Looking at climate change and its consequences on Kinnaur, I provide a contextualized examination of biophysical processes in conjunction with Kinnauri social dynamics and broader state structures of power and political economy. My research adds a new dimension to the field by showing how climate change may provide a temporary landscape of opportunity for marginalized people. I illustrate how climate change is shifting land use practices and changing patterns of agricultural production. Formerly non-arable land in the high altitude zone is being placed under apple production and this newly productive land is contributing to growing prosperity. Simultaneously, I examine the limitations of this prosperity and reasons to be concerned that it is only temporary. Kinnauri livelihood diversity has decreased with growing dependence on one cash crop, and Kinnaur is therefore highly vulnerable to fluctuating markets

and weather conditions. I suggest that livelihood diversification may provide important protection for Kinnauri prosperity.

In focusing on Kinnaur's social dimensions and livelihood sustainability, I argue that the integration and expansion of the market economy is linked to changing social structures in Kinnaur. I examine the evolving human-environment dynamics by discussing the evolution of the traditional Kinnauri practice of fraternal polyandry, social networks of exchange and reciprocity, and the *chilgoza* pine nut, a traditionally important common pool resource in Kinnaur.

This dissertation is dedicated to the people of Kinnaur

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## Glossary of Terms

| | |
|---|---|
| *Adna Malquiyat:* | Inferior ownership of land awarded to peasant cultivators by the *Raja* who was the superior owner of the land. |
| *Ala Malik:* | Superior owners of all lands under their rule. This title was generally bestowed to the *Rajas.* |
| *Begar:* | Comes from a Farsi word, *bikar,* which literally means without work. In this context, *begar* means free labor, or unpaid forced labor |
| *Bhoomi:* | Land |
| *Bigha:* | A *bigha* is a traditional measurement of a unit of land, though land purchases still occur in this unit. It is used in various states in India and other neighboring countries and its precise size varies. In the state of Himachal Pradesh, five bighas are equal to about 1 acre (0.0809 hectare); (12 *bighas* = 1 ha). |
| *Chilgoza:* | *Pinus gerardiana;* a type of pine tree native to Kinnaur. Also called *neoza* in Kinnaur |
| *Devta* | Hindi word meaning deity. *Devas* are the male deities and *devis* are the female deities. |
| *Dharamsala:* | A resting house for pilgrims, or a religious rest house. |
| *Gram Sabha:* | The people's forum, or village assembly; it is a constitutional body enabling each voter to be part of the village decision-making process at the local level |
| *Ghee:* | Clarified butter |
| *Jagir:* | A Farsi word, derived from Sanskrit. Ja refers to place and gir means to take. *Jagir* means possessing or occupying a place, land, estate. |
| *Kanda:* | High altitude land comprising of upper forests and pastures. In the local Kinnauri dialects, the *kanda* is a general term for meadows. |
| *Khule:* | Irrigation channel |
| *Lakh:* | A system of measurement. One *lakh* equals to 100,000. |
| *Nahar*: | Irrigation; Nahar committee is the Irrigation Committee |
| *Nautor:* | An ancient practice which literally means breaking up new land for cultivation |
| *Nazarana:* | Or, *Nazrana* comes from the Arabic word *nazr* meaning gift or offering. *Nazarana* was a form of land rent that was imposed on the peasant cultivators. It can mean payment or fee. The word can describes the value of the land or resources |
| *Paisa:* | A monetary unit. One hundred *paisa* equal to one Rupee |
| *Panchayat:* | Village council. *Panchayat* is the smallest official institution of self-governance in India whose members are elected every four years. |

| | |
|---|---|
| *Pargana:* | Or, customary rate related to the amount of produce the peasant cultivators had to bestowed to the *Raja* |
| *Patta:* | Land registration document under the Revenue Department showing the ownership of a property |
| *Pradhan:* | Elected head of the village *panchayat* |
| *Raja:* | Ruler or king |
| *Rajput:* | Person belonging to the upper caste ruling sector of society |
| *Shamilat:* | Village common |
| *Shamlot Bhoomi:* | Village common lands |
| *Tehsil:* | An administrative subdivision. In Kinnaur, there are five *Tehsils*: Pooh, Morang, Hnagrang, Kalpa, and Nichar *Tehsils.* |
| *Vikas:* | Development; *Vikas* Committee is the Development Committee |
| *Wajib-ul-urz:* | Or, *Wajib-ul-arz;* a document written in Urdu. It is the customary rights of people from prior to the British period. |
| *Wazir*: | An Arabic word referring to a high ranking minister or advisor; also spelled *vazir*, *vizir, and vasir* |
| *Zamindar:* | The direct translation of this Farsi word is "holder of land," though in India it is used for large landlords similar to feudal lords or barons |
| *Zamindari:* | A system of land tenure that was based on landlordism or feudalism |

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# Chapter One: Introduction


**Figure 1: Map of Northern India**

## Introduction and Background

Apple plantation is linked to the economic prosperity and social life of the people. Apple is the only source of income of the people of Kinnaur presently. At the same time, apple plantations have changed the social life of people. Because of being in a scheduled tribe area, the people could not afford to provide better education for their children like in other parts of the country. But the income from apple has allowed us to send our children to receive higher education. Our incomes have increased, our children's lives are better now. Until I married, I was in my parental house and since I came to my husband's house, I had to depend on my in-laws not just in terms of finances, but in terms of decision-making. But now I don't need to depend on them. Now we have our own money. We are spending a lot of money on constructing buildings and we can provide a better life for our children (Interview, September 2012).

This dissertation gives voice to the story of the mountainous rural district of Kinnaur in the Indian Himalaya, a story of adaptation to rapid change and continuity of tradition. Kinnaur is

of particular interest as a manifestation of human-environment claims regarding adaptability, climate change, and the idea that mountain communities are uniquely sensitive to change (Jodha, 1990, 1997). Following the work of Jodha, notably the concept of mountain specificities, I explore how mountain people adapt to their often-challenging environmental and economic niches. I examine the broad drivers of change in Kinnaur that have emerged out of the confluence of political, economic, environmental, and social events of the last seven decades. I investigate adaptation strategies that have evolved in concert with important transitions, including: adaptation to a new agrarian system through shifting land tenure and crop production, adaptation of land use practices to climate change, and adaptation of social norms and practices to the changing opportunities and constraints of a mountain landscape increasingly exposed to the outside world. The overarching questions that I seek to answer in this dissertation are: What are the drivers of change in Kinnaur, and what are the implications of these changes on social, cultural, political, and environmental dynamics? As formerly isolated Kinnaur is increasingly integrated into Indian society, to what extent are Kinnauri livelihoods influenced by external factors including the market and the state, and to what extent by their own agency?

Using different methodological approaches within an ethnographic framework, I argue that the Kinnauri transition of the past seven decades, and specifically its economic progress since the 1990s—the beginning of a period I call Kinnaur's Golden Era—has been significantly influenced by outside forces. Larger geopolitical circumstances and state interventions, in addition to consequences of climate change, have been a major impetus for the Kinnauri transition. In this research I set out to observe "the constantly shifting dialectic between society and land based resources" that Blaikie and Brookfield (1987, p. 17) argue must be at the heart of the examination. The relationship between society and environment is continuously evolving. People shape the environment through their constant use of resources, their management practices and policies. Simultaneously, the environment is continually shaping human identity, culture, and livelihood practices. In the case of Kinnaur, the desire of the government of newly Independent India to bring "backward" subsistence-dependent tribal people of Kinnaur out of poverty, has, seven decades later, resulted in the district's heavy reliance on monoculture apple orchards, which have largely replaced traditional crops and are steadily encroaching on native forest and pastureland. The limits of this process are unclear, but they are certain to be tested.

Through an historical investigation, and using oral histories, interviews, and field observations data, I discuss the Kinnauri transition, beginning with India's Independence and the growing importance of outside market forces. My research follows the suggestions of Blaikie (1985), and Blaikie and Brookfield (1987) that environmental change occurs as the result of complex and interdependent factors, and that understanding environmental degradation requires an examination of broader complex socio-political processes including power relations at multiple scales. In this vein, my study examines the implications of broader social processes on the Kinnauri transition in different spheres of social organization including land tenure, land use, livelihood activities, community structure and decision-making, social institutions, and culture. Additionally, I examine the consequence of climate change on Kinnaur's economy and the district's changing social dynamics in light of larger social and political processes described by scholars in the field of political ecology. In looking at climate change and its consequences on Kinnaur, I provide a contextualized examination of biophysical processes of climate change in conjunction with Kinnauri social dynamics and broader state structures of power and political economy.

In the last seven decades, Kinnauri society has faced significant shifts in land and natural resources, social organization, and culture. Certain constraints, including Kinnaur's severe geographic setting and scarcity of arable land, have historically compelled Kinnauris to adapt to, and coexist with, their surroundings. With increasing exposure to markets and the world beyond its mountainous perimeter, manifesting ultimately in rapid and unplanned development, the human-environment balance has been going through a transformation in Kinnaur. Various trade-offs have been made since the apple economy began in the mid 1950s, grew rapidly in the 1990s, and has continued into the present. Kinnaur's geo-political and environmental circumstances have created a temporary landscape of opportunity for this once-isolated mountain region. The current Kinnauri reliance on the apple economy has raised incomes, and brought many of the advantages and amenities of higher income. Simultaneously however, Kinnaur's lack of livelihood diversity may leave it more vulnerable to economic or environmental shocks. Reliance on one cash crop as the main source of income, in a region subject to an often-volatile and changing climatic regime, is risky. The Kinnauris have already begun to experience this, in the form of intense unseasonable storms that wipe out orchards and take out roads. Additionally, there are ramifications of social change including, for example, changing family structure, continuous partitioning of land into smaller parcels, and shifting labor relations. More generally, there are indications that social relations based on networks of reciprocity and exchange at both the household and village level, which once served as survival strategies and safety nets, are weakening.

# Kinnaur in Transition

## *Background*

Kinnaur District is located in the remote southeastern corner of the state of Himachal Pradesh in northern India. The area is adjacent to the Tibetan border to the east. The district extends over 6,400 $KM^2$ of the Western Himalayas (Chawla, Kumar, Lal, Singh, & Thukral, 2012). Three roughly parallel mountain ranges, the Zanskar, the Great Himalaya, and the Dhaula Dhar Ranges traverse through Kinnaur. Their year-round snow covered peaks range in altitude from 5,180 m to 6,770 m (Chawla et al., 2012). The Sutlej River is the easternmost and longest of the five tributaries of the

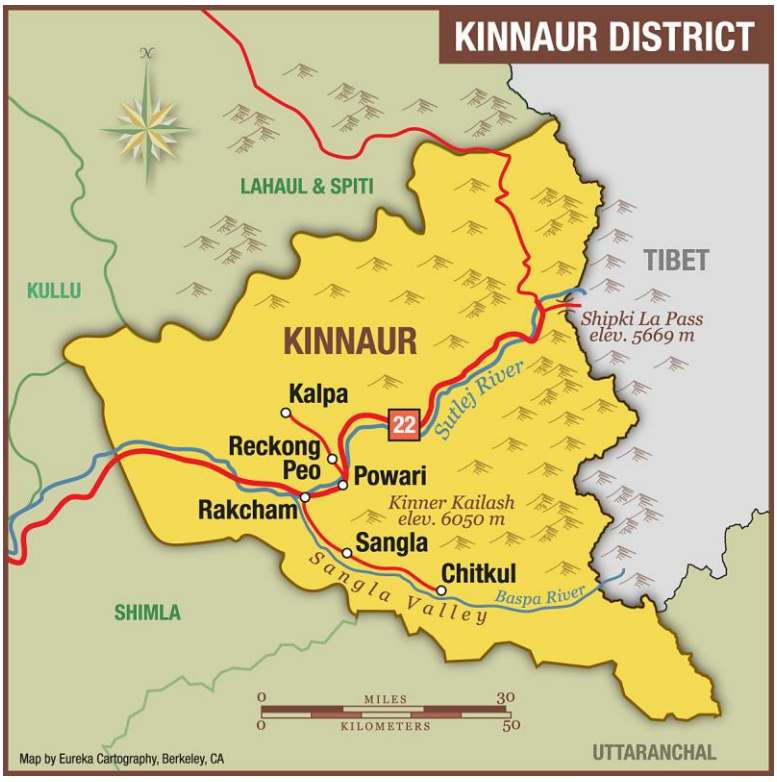


**Figure 2: Map of Kinnaur District**

Indus River and flows out of Tibet into India at Shipki La Pass and drains Kinnaur (Sanan & Swadi, 1998). The district is roughly divided into three agro-climatic zones that match the altitudinal zones corresponding to the district's physical units of Lower, Middle, and Upper Kinnaur (Raha & Mahato, 1985; Sanan & Swadi, 1998). There is a large difference in the amount of rainfall between Upper and Lower Kinnaur. For example, the high mountain desert Pooh Belt in Upper Kinnaur receives an annual rainfall of 45.4 mm, while Nichar Belt in Lower Kinnaur receives an annual rainfall of 380 mm (Chawla et al., 2012). The district as a whole is rugged and mountainous, with many narrow and steep watersheds flowing into the Sutlej River, and during the monsoon season there are frequent landslides. Because of its rugged nature, cultivable agricultural land is limited and land in general has low fertility, and the land that can be cultivated has been heavily terraced (Chandra, 1981; Singh, 2003a)

On 15 April 1948, a year after India attained Independence, twenty Princely Hill States of Punjab and Shimla and nine feudatories all became part of the Centrally Administered Chief Commissioner's Province of Himachal Pradesh (Ahluwalia, 1998). Himachal Pradesh subsequently became a Union Territory on 1 November 1956, and it was thus governed directly by the Union President of India. Himachal Pradesh finally rose to statehood on 25 January 1971 becoming the 18$^{th}$ state of the Indian Union (Ahluwalia, 1998). From 1948 to 1960 much of Kinnaur was under the Chini Tehsil of Mahasu District. On 1 May 1960, Kinnaur became an official District of the State of Himachal Pradesh (Chib, 1984). This move was to make administration of the area easier and more efficient and to aid in rapid development of inaccessible areas of the Himalaya. The headquarters of the district was initially situated in the village of Kalpa[1] and was later moved to the town of Rekong Peo in 1990 where it has remained as the district capital.

In 1960 Kinnaur was given the status of a Scheduled Area designating all Kinnauris with Scheduled Tribe status. Under this category, tribal peoples of India receive economic, political, social, and educational advantages and opportunities. The term Scheduled Tribes is a legal description of tribal peoples of India under the Indian Constitution.

The events that propelled Kinnaur's recent transition began with India's Independence in 1947, which initiated an agrarian change, shifting a semi-feudal agrarian system under which the landless Kinnauris cultivated the lands of the upper caste land owning class. The goal of Himachal Pradesh's forming government was to decrease poverty, reduce isolation, and improve agricultural yields (Mehta, 2006; Singh, 1996; Vedwan, 2001). To change the existing agrarian structure and improve the lives of marginalized populations of isolated mountainous regions, land reform programs were implemented to provide land to the landless. Simultaneously, to bring these isolated hill areas into the mainstream Indian economy, the state sought to develop the agriculture and horticulture sectors of the area by promoting the cultivation of cash crops (Vedwan, 2001). Beginning in the mid 1950s, a strategy of horticulture expansion in high elevation areas of the state was adopted and actively encouraged by the state (Vedwan, 2001). Kinnaur was mainly targeted for growing apples[2].

Initially, a small number of politically connected elite adopted apple cultivation. The old Hindustan-Tibet trade route, the main artery linking Kinnaur to the Indian Plains, was little more than a mule track. Once it was improved and opened up to jeeps in 1959, travel to places like

[1] In some revenue documents and older census data Kalpa is referred to as Chini.

[2] Though other agricultural and horticultural cash crops were also experimented with, apples were initially chosen and remain the dominant cash crop in Kinnaur.

Shimla[3], Chandigarh[4], and Delhi became much easier. Because most local Kinnauri politicians had the means to travel, they were some of the first exposed to the economic benefits of apple orchards around the Shimla Hills. They were also amongst the first to have benefitted from state programs centered on horticulture expansion. This sector of society, therefore, first experimented with growing apples on their own land in Kinnaur. The village of Kalpa, then called Chini, served as the district headquarters of Kinnaur at the time, housing many Kinnauri officials and politically connected elite. Kalpa became one of the earliest villages to experiment with apple production. Once the orchards of early adopters had matured and were providing profits in the 1970s, apple production started to receive wider interest. The broader adoption process that followed was gradual, however, as resources and knowledge were necessary to convert fields of traditional crops to apple orchards.

> In the 1970s, as more and more people were starting to develop their orchards in Kalpa area, there were opportunities to do labor work and make money. Local Kinnauris engaged in labor in the orchards of the elite and politicians and earned money that way. This was one of the ways in which money began to circulate in people's hands. By laboring on others' orchards, people also learned about apple cultivation, which then trained them to start their own orchards (Interview, November 2012).

Kinnaur's strategic geopolitical location has also influenced fundamental changes for the district. India's national security requirements have engendered significant and extensive social and economic effort to develop the district. Though India's Independence initiated change, the outcome of the Indo-China war of 1962 has been particularly important in Kinnaur's modern history leading to the strategic construction of a major highway into the district by the Indian military. The year 1962 was the beginning of a new shift for Kinnaur's development and progress. Prior to 1962, Kinnaur was an isolated mountainous tribal area devoid of significance for the Indian Government. The year 1962 thus marks the beginning of Kinnaur's economic progress and the advent of a cash economy. The opening of the national highway to vehicles was aimed mainly at transporting Indian troops and supplies to the many military instillations in Kinnaur and along the border region. Since its construction, the national highway has become the main artery through Kinnaur for civilians as well. The district has gradually integrated into the Indian economy and has become increasingly exposed to larger Indian and international markets. Participants commonly referred to the national highway as the gift from the Chinese due to its development implications for Kinnaur, "This national highway is the gift of the Chinese. If they had not attacked, then the government of India would be sleeping" (Interview, September 2012).

The construction of National Highway 22 through Kinnaur has been instrumental for the economic development of the region in several ways. 1) The road initiated a cash-based economy by employing Kinnauris as road workers and for the first time providing many people with off-farm employment and a cash-based income. 2) Kinnauris had easier access to the outside area where they were able to also work as laborers and earn a wage. 3) The road enabled better transport of goods into and out of Kinnaur, especially apples, which could be more easily transported to markets outside of Kinnaur. 4) Overall, the highway opened

[3] Shimla is the capital city of the state of Himachal Pradesh located in the District of Shimla. Shimla city is located west of Kinnaur District and south of Kullu District.
[4] Chandigarh is the capital city of the state of Punjab

communication and expanded the economic diversity of Kinnaur's small villages, which have slowly become connected to the national highway through link roads and have thus become integrated with the larger Indian economy.

A second set of changes transpired in Kinnaur in the 1990s that instigated further expansion of apple orchards. During this time, the Indian government took actions that both directly and indirectly accelerated the pace of change in Kinnaur. The 1990s was an era of liberalization of the Indian economy that promoted the growth of horticulture in mountainous areas such as Kinnaur. During this time, the Indian government once again further developed its horticulture sector and promoted knowledge-based technologies and other programs to remote areas such as Kinnaur (Mittal, 2007). The consequences of the political economy of globalization, including neoliberal reforms, have brought increased prosperity, but this process has also resulted in rapid social, cultural, and environmental changes. More direct government interventions included the lifting of travel restrictions to Kinnaur, an area that had been considered a sensitive military zone until this time. Kinnaur thus began to experience a growing tide of outside visitors – including tourists, entrepreneurs, and migrant laborers – and a boom in its apple economy.

By the 1990s, improved access to markets and availability of additional subsidized farm/orchard inputs, including technologies, chemical sprays, and fertilizers, further encouraged the Kinnauris to expand apple orchards and other cash crops such as peas and kidney beans. Further, people had better access to credit and loans, especially for agriculture/horticulture development. Additionally, with their Scheduled Tribes designation, the Kinnauris have been supplied with staple food grains at a subsidized rate, which further reduced the importance of cultivating traditional crops for subsistence and expedited the replacement of cultivable lands to orchards.

In the face of these forces, Kinnauri society has gradually shifted away from subsistence agro-pastoralism towards a reliance on commercial apple production and tourism. Though the Kinnauris' standard of living has increased, there appear to be significant environmental, social, and cultural trade-offs as these communities undergo dramatic changes in how they relate to the land, to each other and to outsiders.

## *Research Setting*

In September 2011, I arrived in Kalpa to begin a period of participant ethnographic research intended to better understand the social, environmental, and economic changes induced by the expanding apple economy and broader geopolitical processes. This work was motivated by an interest in how tribal communities in general, and Kinnaur in particular, in remote mountainous regions, whose livelihood strategies depends on land-based resources adapt to change. My research was inspired by the work of Jodha, specifically on traditional communities in mountain regions of the Himalaya, many of whom have devised norms and practices with which to better face their opportunities and constraints (Jodha, 1990, 1997, 2005a, 2005b).

While conducting my fieldwork for this research, I lived in the small village of Kalpa at an elevation of 10,000 feet. I secured a home stay with a Kinnauri family, which allowed me to witness the production of life all around me. As it is common for many Indian families to live in a joint family household, my landlord's elder parents also lived in the same compound. I developed a close relationship with them visiting and interviewing them regularly. I was able to witness many of the important changes that are occurring in Kinnaur within one family system. The juxtaposition of tradition and modernity became clear in the generational gaps between the

grandparents, parents, and grand children. The grandparents come from a life dependent on subsistence agriculture, a time when cash was scarce in Kinnaur. They witnessed India transitioning to an independent state, and were part of the transition from subsistence agriculture to commercial horticulture and observed Kinnaur's nascent apple economy develop. Their son regularly managed and nurtured the orchards that were established by his father. But the grand children were living in a completely different world. As is now the practice in many Kinnauri families, the grandchildren were sent to live outside of Kinnaur in the town of Rampur, 96 kilometers away and about three to four-hour drive in a private car and much longer on a public bus. They lived with family members in order to attend "better schools." They were being raised separated not just from their parents and the orchards, but from the land itself. In general, young people are sent to far away cities such as Shimla, the capital of the state of Himachal Pradesh (about 220 kilometers and an eight-nine hour drive), or Chandigarh in the neighboring state of Punjab (330 kilometers and a 10-11 hour drive).

Living with my host family in the middle of their apple orchard exposed me to different contemporary issues surrounding the orchard. I witnessed orchard activities during different seasons including spraying, pruning, irrigating, harvesting, and selling apples to the contractors. As my host family had a group of between eight to 10 resident seasonal migrant laborers living underneath my room, I was able to observe the interactions of the local Kinnauris and the migrant laborers. I saw the laborers carry loads of fertilizer and other equipment to newly developing orchards in the upper reaches that have in recent years become conducive to growing apples as the result of the warming climate. I observed many orchards, including that of my neighbors, destroyed as the result of landslides caused by disruptive weather patterns. I also witnessed their hired labor engaging in months of back-breaking work rebuilding the terraced landscape one stone at a time. Although in the past people had fields of traditional crops and not terraced orchards, the Kinnauris themselves engaged in any type of work that was related to the fields rather than hiring labor. I felt fortunate for living in this microcosm that represented the larger processes taking place in Kinnaur. The culmination of these factors has resulted in many layers of social and cultural change in the Kinnauri social structure. My fortunes did not end there, however, because my window into Kinnaur was greatly expanded through my friendship with Mr. Shyam Saran Negi.

Mr. Shyam Saran Negi cast the very first vote in 1951 in India's first election after the country's independence from the British. The officials of the newly forming India decided to hold the country's first election in remote mountainous region. Due to concerns about heavy winter setting in and preventing people from making it to the voting booths, Kinnaur was chosen as the country's first area to undergo the election process. At that time, Mr. Shyam Saran, one of the few educated people in Kinnaur, was a primary school teacher. He was thus chosen to cast the very first vote in independent India's first election. During many of my interviews with Kinnauris, they would respectfully refer to him as Master Shyam Saran and many would recall the time when he was their school teacher. As Mr. Shyam Saran lived close by, I developed a friendship with him and visited him regularly. I was grateful for my opportunity both because he was a considerable source of information and interesting stories from Kinnaur's past, and because my association with him facilitated other social interactions.

My friendship with Mr. Shyam Saran and other elder Kinnauris and my living situation with my host family helped me obtain a glimpse into Kinnaur's past while observing the current fast pace of change taking place all around me. I learned about a time prior to India's independence when subsistence was the dominant mode of livelihood. I collected oral history

data on land-related issues including state-led land reform programs that have provided Kinnauris with access to land, which still remains to be the source of their livelihood.

## Political Ecology and Change in Mountain Communities

My research has been motivated by works of political ecologists like Blaikie's (1985) *The Political Economy of Soil Erosion in Developing Countries*, which was based on his research in the Nepal Himalaya, and Blaikie and Brookfield's (1987) *Land Degradation and Society*, as well as works by other scholars who use this framework to address complex socio-environmental processes through an interdisciplinary point of view (Robbins, 2004; Swyngedouw, 2003; Watts, 2000). These studies illustrate how land degradation results from broader complex processes of social relations, power dynamics, political economy, and access and control of resources, and that degradation was not exclusively due to biophysical factors. My ethnographic observations in Kinnaur allow insight into the many changes affecting the Kinnauri people through the lens of their own reports and experiences of these transitions. In addition to discussing the biophysical changes, I will provide an analysis of other factors including socio-economic, political, and cultural, contributing to change. Blaikie and Brookfield (1987, p. 17) put forth a theory of "regional political ecology" combining "the concerns of ecology and a broadly defined political economy" including the role of the state. They argued that the relationship of those living off the land and managing natural resources must be understood in a "historical, political, and economic context" (Blaikie & Brookfield, 1987, p. 239). In this dissertation, I follow the path of these scholars by providing multifaceted contextual analyses of the history of land tenure, climate change, and the ramifications of India's broad political and economic dynamics on Kinnaur.

A further motivation for this research was the claim of Agrawal and Sivaramakrishnan (2000) that in studies of agrarian change, peripheral areas such as mountains are rarely considered by researchers of agrarian politics and history. My study fills this gap by tracing the implications of critical agrarian changes, specifically in terms of land tenure and climate change. Perceptions of property in Kinnaur have evolved over time along with changes in rulers – from various regional mountain kingdoms and feudal states, to a Princely State under the indirect control of the British Colonial rulers, and subsequently to the post-colonial era with India's adoption and re-interpretation of colonial policies related to land and natural resources. Kinnaur offers opportunities to study the interplay of history and notions of landed property, examining the agrarian production system in conjunction with environmental change.

### Political Ecology

Political ecology emerged in the 1980s from the field of cultural ecology (or ecological anthropology). Cultural ecology viewed the environment as static with its examination devoid of issues of social change and power dynamics, which influence human-environment interactions (Bryant, 1992). Isolated subsistence societies were viewed as being in a state of equilibrium and a self-regulated system (Neumann, 2005). Succeeding scholarly work, however, began to show that there are few places around the world that are uninfluenced by outside forces, especially by global economic factors including capital, commodities, and labor (Neumann, 2005). Political ecology emerged from this critique of cultural ecology, and emphasized the idea that human-environment dynamics are not confined within a closed ecosystem (Bryant & Bailey, 1997), but rather that communities are integrated within a wider system shaped by political and economic structures.

The literature of political ecology initially focused on agrarian and peasant production in the Global South (Bassett, 1988; Blaikie, 1985b; Blaikie & Brookfield, 1987; Peluso, 1992a; Watts, 1983). In post-Independence India, scholarship on agrarian studies has generally been concerned with highly productive agriculture, on the basis that that "these regions are most capable of producing a social surplus, and that these agrarian spaces have undergone the most significant social and political changes" (Agrawal & Sivaramakrishnan, 2000, p. 4). Marginal areas and social groups – such as mountainous regions, tribal populations, and forest resources – were largely overlooked in terms of their agricultural system, but were the focus of studies of environmental scholarship (Agrawal & Sivaramakrishnan, 2000). This observation motivated my research focus on mountainous regions and the resulting study of Kinnaur helps address that gap in the literature.

Agrawal and Sivaramakrishnan (2000) critiqued the notion of disengaging agrarian studies from environmental studies, as such an approach ignores the ways in which people and the environment shape each other (Agrawal & Sivaramakrishnan, 2000). In Kinnaur, for example, a division between agrarian and environmental examinations would neglect a rich history of the adaptation of Kinnauri land-based livelihood systems to, and with, the environment of Kinnaur.

The politics of nature – the very complex politics in which nature and culture are linked – are revealed in the ways in which humans manage their environment and natural resources. The degradation, restoration, and protection of nature are connected to culture, race, environmentalism, and class (Kosek, 2006). Ecological degradation should be viewed not only as a biophysical phenomenon, but as a complex socio-environmental problem (Blaikie, 1985a). In order to understand the specificities of local and regional geographies where new natures are continuously being made and reshaped, it is necessary to move beyond the fixed ideas of management, access, and traditional practices. By moving beyond a rigid conception of a forest as a resource, for example, various forest natures and relationships at play will begin to appear (Kosek, 2006). Such an analysis will provide a better understanding of nature, power, and governance with important attention placed on the productive expressions of power.

A significant principle in political ecology is that power dynamics and power relations are an important factor in human-environment interactions (Neumann R. P., 1992; Neumann & Schroeder, 1995; Peet & Watts, 1996; Peluso, 1992b). Additional work has examined how power relations affect access and control over land and other natural resources, and over capital and labor (Agarwal, 1992; Carney, 1996; Jackson, 1993; Schroeder, 1993). These studies motivated my interest in power dynamics in Kinnaur, specifically in relation to land allocation under land reform programs (see Chapter Two).

Discussions of contentious issues related to conservation and debates between local interests and state control of natural resources, such as the management of forests and pastures, help reveal the complex interconnected processes between people and environment (Agrawal & Sivaramakrishnan, 2000; Arnold, 1995). Saberwal's (1999) work makes a good case of this notion as he focuses on the Gaddi pastoralists of Himachal Pradesh and the "alarmist discourse" imposed by government officials that unregulated grazing is leading to large-scale deforestation and pasture degradation, causing soil erosion and flooding. He argues that this discourse of environmental degradation is actually attributed to decades of power struggles over use of forest lands between the pastoralists and the Forest Department. Saberwal (1999, p. 3) argues that the Forest Department has failed to regulate land use practices, as new strategies of resistance are constantly adopted by the pastoralists to overcome state-imposed restrictions. Because of this

failure, the department has been 'forced' to adopt their "alarmist discourse" that degradation is caused by grazing (Saberwal, 1999).

Political ecology provides a deep understanding of historical processes and the intricate relationship between nature and humans positioned in a biological, cultural, and political context (Blaikie, 1985a; Blaikie & Brookfield, 1987; Peet & Watts, 1996; Zimmerer & Bassett, 2003). Societies are a product of their history, understanding current patterns of change therefore, requires critical examination of historical events. For example, Bauer (2004) uses the Dolpo agro-pastoralists of the trans-Himalaya in Nepal as a case study to illustrate the process of changing Dolpo production systems and their adaptation to broader economic transition (Bauer, 2004). He traces the history of the Dolpo livelihood system rooted in trade, agriculture and animal husbandry, serving as important survival strategy in the Dolpo's high elevation environment (Bauer, 2004). Bauer employs a multi-scalar approach (Moore, 1996) to investigate linkages between local social, political and economic dynamics and broader regional political and economic events in Nepal, India and neighboring China since the 1950s and how these events have shaped the current Dolpo social and ecological landscape

Scholarly work focused on Himalayan land use and environmental degradation has illuminated the complexity of human-environment issues and the difficulty of objectively evaluating environmental change (Bauer, 2004; Berkes, Duffield, & Ham, 1996; Davidson-Hunt, 1995; Guha, 2000; Ives, 1987; Ives & Messerli, 1989; Saberwal, 1999; Singh, 2003a; Singh, 2009). Looking back on this scholarship, one can see how scholars have put forward theories that have become very influential for a time, only to be replaced by a conflicting narrative or a narrative that incorporates additional considerations. One example is the emergence of the Theory of Himalayan Environmental Degradation, a crisis narrative, or alarmist position that emerged in the 1970s (Ives, 1987). It was rooted in the Malthusian ideas that population growth and land use practices of rural inhabitants were leading to deforestation and soil erosion in the fragile Himalayan ecosystem, and therefore causing flooding and environmental degradation (Blaikie, 1985b; Ives, 1987; Ives & Messerli, 1989). With their careful investigations, Ives and Messerli (1989) however, cautioned against simplistic assertions, and argued that such environmental problems must be situated in their historic, political, economic, and social context (Ives, 1987; Ives & Messerli, 1989).

Over time, Himalayan political ecology has evolved to embrace increasingly complex social and ecological dimensions that reflect change and continuity within the natural landscape and broader sociopolitical contexts. Sophisticated narratives have focused on the clash of competing legitimate interests, integration of the role of natural disturbance processes, and an appreciation that sustainability of "traditional" resource use depends on the integrity of social and cultural structures that limit individual exploitation (Bauer, 2004; Berkes, Davidson-Hunt, & Davidson-Hunt, 1998; Berkes & Folke, 1998; Davidson-Hunt, 1995; Saberwal, 1999; Singh, 2003a; Singh, 2009). My study therefore, looks at Kinnaur through the lens of political ecology both for the promise of understanding Kinnaur better, and for better understanding of systems of human-environment interaction in general.

## *Mountain Specificities*

Globally, mountain communities are becoming increasingly exposed to and altered by outside influences such as climate change (Beniston, 2003) and market penetration (Jodha, 2000). While mountains are home to nearly ten percent of the world's population, 40 percent of the world's population is dependent on them for resources, such as water, energy, timber, fuel,

fodder and recreation (Cole & Sinclair, 2002). Many communities in higher elevation regions are faced with changing climate patterns and other outside influences on long-standing patterns of socioeconomic behavior.

Mountain regions, like any specific ecosystem, require a special set of perspectives for analyzing the livelihoods of mountain inhabitants (Rhoades, 1997). This dissertation uses Jodha's framework of "mountain specificities" (Jodha, 1990, 1997) to describe these distinguishing characteristics. I have used this framework to understand the implications of climate change in Kinnaur. Mountain specificities refer to important limiting as well as enabling characteristics that influence the interaction between humans and the environment (Jodha, 2009; Jodha, Banskota, Partap, & ICIMOD, 1992b). These characteristics show a great deal of variability within different regions, and are interconnected (Jodha, 2009) and determine the pattern of change in mountain areas (Jodha, 2005b). They include inaccessibility, fragility, and marginality, which are considered constraints, and diversity or heterogeneity and niche or comparative advantage (natural suitability of niche), which are considered opportunities (Jodha et al., 1992b; Rhoades, 1997). The two opportunities respond to, or adapt to, the three constraints and therefore represent human resilience to harsh mountainous environments (Jodha, 2005b). Due to the "inherent diversity" of mountain environments, rural mountain peoples have devised adaptive strategies to take advantage of the opportunities and maneuver around and adapt to the constraints (Sinclair & Ham, 2000, p. 91). I discuss each of these in detail below.

Inaccessibility refers to overall difficult mountain terrain. Kinnaur was certainly inaccessible in the sense that Jodha uses the word. Before the construction of the national highway, roads into Kinnaur and its high mountain valleys were little more than foot paths for pack animals. This characteristic is one of the most common features of mountain areas (Price, 1995). Inaccessibility results in isolation, poor communication, and high cost of infrastructure leading to poor infrastructure, which limits mobility and access to external services and support (Jodha, 2005a). Jodha (2005, p. 34) writes that in order to respond to the issue of inaccessibility, it is imperative to engage in "Local resource centered, diversified production/consumption activities fitting to spatial and temporal opportunities and constraints." In the 1950s, politicians of the state of Himachal Pradesh determined that these high elevation areas had a niche for fruit production and were therefore suitable for commercial horticulture production. Apples were therefore introduced to Kinnaur and other areas in Himachal Pradesh. However, due to lack of proper infrastructure, and the area's inaccessibility, large scale expansion of apple orchards did not take place until the 1990s when people had better access to infrastructural technologies. And even today, with the national highway providing an active connection to the rest of the world, Kinnaur remains relatively inaccessible as the road is regularly under construction from landslides.

The second important characteristic of mountain areas is that they are fragile and vulnerable to disturbances. The Himalayan Mountain system is one of the most seismically and tectonically active, experiencing continuous growth, making the region one of the most unstable and fragile mountain zones in the world (Sati, 2014). This upward movement manifests in constant landslides and floods in the region. The fragility of mountain regions places limitation on their ability to undergo disturbances. Rapid change and overuse of resources by humans inhabiting mountains may have irreversible consequences and therefore cause further fragility and vulnerability (Eckholm, 1975). Fragility also manifests socially as livelihood resources are generally scarce and can lead to livelihood uncertainty. The Kinnauris have adapted to fragile mountain slopes by building terraces held in place through elaborate stone work. Additionally,

by linking various elements of their farming system with forest resources and animal husbandry, they have diversified their livelihood base.

Finally, marginality refers to both the physical conditions of the area as well as to the inhabitants and their livelihood systems. Marginality is similar to fragility in that "remoteness and physical isolation, fragile and low-productivity resources" contribute to this state (Jodha, 2009, p.13). Additionally, due to these physical constraints, mountain regions are poorly equipped for integration with mainstream economies. Marginalization therefore can occur when particular mountain niches are overused and exploited by mainstream economies "at unfavorable terms of trade for mountain areas" (Jodha, 2005a, p. 34). For example, there are numerous hydroelectric dams constructed on the Sutlej River and on Kinnaur's smaller rivers and streams for production of electricity, most of which is shipped outside of Kinnaur. While Kinnauris do benefit from rural electrification, they are marginalized in a number of ways by these projects: they bear the heavy environmental costs of hydroelectric project construction; they generally do not benefit economically from construction contracts controlled by politically connected outsiders. And, they often find themselves deprived of water as well, when tributaries are diverted to maximize reservoir storage. The projects, conceived and controlled from a great distance, have been constructed "at unfavorable terms of trade" for Kinnaur, a clear sign of Kinnaur's marginalization.

Balanced against these constraints are some opportunities. Due to the physical and environmental conditions of mountains, there can be vast ecological and cultural diversity or variability within a small area (Price & Neville, 2003). Environmental conditions in mountain areas drive mountain inhabitants to adapt strategies to survive in those conditions, "Rather than being a determinant of agricultural form and technique … these environmental conditions merely frame any number of possibilities which are given form over time through practiced human ingenuity" (Macdonald, 1998, p. 314). Diversity of production and of resource use is an important component of mountain environments and mountain people's survival (Jodha, 2005a). The increasing drive to cultivate cash crops in mountain areas, however, lowers the diversity of farming systems in these regions, creating an imbalance in the human-environment interactions (Jodha, 2005b), as can be seen in Kinnaur. Mountain agricultural systems of cultivation of a variety of traditional crops are replaced with a high-value cash crop system that diminishes agrobiodiversity (Partap et al., 2012), as can be seen in Kinnaur where a variety of traditional crops, including varieties of buckwheat, and fruit trees, like apricots and walnuts, have been replaced with apple orchards.

Mountain agricultural systems of cultivation of a variety of traditional crops, such as varieties of buckwheat in Kinnaur, and fruit trees, such as apricots and walnuts, during different times of year have been gradually replaced with a high-value cash crop system that is diminishing agrobiodiversity (Partap et al., 2012).

Specific physical conditions of mountains create certain ecological niches not found in plains areas, for example, certain medicinal plants that grow in specific valleys, hydroelectric production, horticultural cash crops, and transhumance. Specific mountain niches are used in various diversified activities by the local inhabitants. If these niches are harvested properly, it can lead to a sustainable system. Unsystematic amplification of niche production to fulfill external market demands however, will lead to an unsustainable system. One such example is the *chilgoza* pine nut, which has traditionally been used in trade and has had significant importance to Kinnauris. Its importance, however, has diminished as cash crops such as apples have taken prominence. Although one Kinnauri niche, its apple economy, its rapid expansion

may also have long-term harmful consequences. For example, the indiscriminate use of chemical pesticides and fertilizers are damaging biodiversity and affecting pollinator species. The use of such chemicals is likely to intensify as warmer weather patterns due to climate change allow the reproduction of pests and diseases that were once destroyed by cold winters to expand and therefore further increase the use of chemicals.

Mountain peoples have learned to adapt to the conditions and restrictions in which they live, such as planting zone-specific crops, or they have modified conditions, for example, by building terraces or irrigation channels to suit their needs. Jodha (2005) refers to this as a two-way adaptation strategy. Prior to mainstream market integration in mountain areas, these adaptation practices were employed for protection against risk. As remote mountain communities have become further assimilated with the broader markets however, a "shift from supply-driven to demand-driven resource use systems" has occurred, generating an overuse and exploitation of resources to fulfill rising internal and external demands (Jodha, 2005a, p. 35). In traditional subsistence economies, the two-way adaptation strategy was generally supply driven, where "demand was adjusted to supply conditions" (Jodha, 2005a, p. 35). Market integration however intensifies resource use and extraction, therefore leading to degradation and depletion of resources and creating an imbalance in the traditional two-way adaptation process. Although this shift may improve the economic status of mountain people, as has been in the case of Kinnaur, over use of resources and unsustainable production practices create both environmental and socioeconomic vulnerabilities in mountain regions (Jodha, 2005a). The high prices fetched for apples and the demand placed on them by the growing Indian middle class is an example of Kinnaur shifting its traditional subsistence production to a demand-driven system shaped by wider national and international market forced.

The above mountain specificities, or their characteristics, affect the comparative advantages of mountain regions compared to the lower elevation or plains areas. Economic transition in Kinnaur has created new types of land use, resource access, and community institutions, while making other types obsolete. By understanding what type of management and adaptation approaches are required for each specificity, effective sustainable mountain production strategies may be implemented (Jodha, 1990). However, when mountain specificities are infringed upon by development initiatives, commercialization, or changes in resource use practices, degradation occurs and sustainability and diversity may diminish (Jodha, Banskota, Partap, & ICIMOD, 1992a). Inadequate attention to mountain specificities may create vulnerabilities to climatic changes and economic or other ecological uncertainties as livelihood diversification decreases (Ellis, 1998; Scoones, 2009). Such changes can lead to overexploitation of resources, resource depletion, and ultimately poverty that then motivates further overexploitation. These concerns are relevant to Kinnaur, even as it currently undergoes its period of prosperity.

## Methods

To understand the social, ecological, and economic implications of market economy in Kinnaur, I chose qualitative ethnographic methods grounded in political ecology. Ethnographic research is characterized by gathering data through such means as participant observation and open-ended interviews, seeking to develop an in-depth understanding of a geographic setting, the people inhabiting that setting, and the various layers of relationships between those people (Harper, 1992). Hart (2004) argues in support of using critical ethnography to illustrate the relationship between markets, politics, power, society, and cultural values across space and time.

Geertz refers to ethnography as "thick description," moving beyond what is being observed to an understanding of elaborate social dynamics (Geertz, 1973, 1983). This approach is valuable in illuminating complexity within rural communities (LeCompte & Schensul, 1999b), and also in identifying traces of the global within the local (Appadurai, 1996). Ethnography can be an examination of the affects of global processes in a given area through a micro-level investigation of those processes, and thus is appropriate for answering my questions.

Ethnographic knowledge is produced and shaped by the background and social identity of the researcher in relation to those being researched (Jackson, 2006; Richa Nagar & Geiger, 2007). I therefore, attempted to conduct regular self-reflection in relation to, and while interacting with, my respondents and to the Kinnauri society in which I was living and collecting observational data. This awareness and self-critical introspection is what gives the researcher a chance at neutrality (Jackson, 2006). I tried therefore, to be mindful of my own beliefs and attitudes in relation to the social structures that exist within the Kinnauri society, including those of class, caste, gender, and age.

My first visit to Kinnaur was in June of 2010 when I travelled to India to investigate potential research sites. During my short visit and my observations and conversations with Kinnauris, I was able to observe the area going through a transition. Kinnaur also stood out because relatively little academic social science research on socio-economic transformation and dramatic changes that are currently taking place had been conducted in the district. This is perhaps because of the area's remote location and historic political sensitivity due to its proximity to the Chinese border. Kinnaur, therefore, represented a suitable research site to examine how rapid socio-economic change affects environmental and cultural dynamics in remote rural communities. Lessons learned from this research will have relevance to remote communities undergoing similar change throughout the Himalaya and in other mountain regions of the world.

## *Research site*

The central site of my research, which was also my residence during my time in the field, was Kalpa, a village with a population of about 3,000. Kalpa is in the middle altitude range in Kinnaur, at an elevation of 2960 meters (9711 feet). It is one of the oldest and largest villages in Kinnaur (Gautam, Kshatriya, & Kapoor, 2010), and also one of the most modern villages in the district, making it an ideal place to observe the changes that have taken place in Kinnaur, and which may continue to spread to other more remote villages in the future. I conducted the principal part of my fieldwork in Kalpa and surrounding areas. However, I also made visits to other villages for data collection. Kalpa, the former headquarters of the district, is about eight kilometers from the new district capital, the town of Rekong Peo. Kalpa's close proximity to Rekong Peo made it convenient to travel back and forth to the administrative center of Kinnaur where I conducted interviews with government officials and politicians.

## *Research Assistant*

Although I am able to carry on basic conversations in Hindi, I hired a research assistant to help me conduct my interviews and focus group discussions. This was to avoid misunderstandings and to capture nuances. My research assistant, a young Kinnauri man, helped augment my understanding of Hindi and facilitated access to research subjects and documents from various government agencies. My research assistant was well-informed about different issues in Kinnaur, and he was well-connected and friendly, which made it easy to connect with

both men and women. Because Kinnauri women are generally more liberated than women in villages in the plains areas, having a male research assistant did not affect the participation of women in this research. Further, my research assistant was of lower caste creating a greater opportunity with that population, which supplemented the access to upper caste Kinnauris that I had in my friendship with Mr. Shyam Saran.

## *Sources of Data*

Data were collected during five field visits to the Kinnaur District of the state of Himachal Pradesh in the Indian Himalaya during the years 2010 to 2014. The time spent in the field during those years totals roughly eleven months.

I used an interrelated method of data collection (Lofland & Lofland, 2006) including in-depth semi-structured and open-ended interviews, six focus group discussions, and participant observation. I carried out a total of 139 in-depth semi-structured and open-ended interviews, 17 of which were oral histories with elders, and six focus group discussions. Additionally, participant observation was a continuous method of collecting data throughout the duration of the research. My interviewees belonged to 48 Kinnauri villages, and I personally visited 35 villages distributed in Lower, Middle and Upper Kinnaur where I conducted participant observation and interviews.

In addition to my interviews, which provided a setting for formal conversations, I was constantly engaged in informal conversations with people. I spent hours walking around villages spending time with people in their homes, in their orchards, and in their shops. As mentioned earlier, I lived at a home stay with the family of Mr. Shyam Saran Negi. As Mr. Negi is a public figure, I was able to witness his interactions with different political groups, the media, and people in the village where he is much revered. Through my informal interactions and participant observations, I was able to collect valuable data related to social contexts. This allowed me to devise better interview questions and to better understand and interpret the interviewees' responses. Historical analyses, both through secondary literature and oral history interviews with elders provided a foundation upon which to contextualize people's situation.

In 2010, I spent about two weeks in the village of Kalpa where I established a relationship with Kinnauris by being present in the villages and passively observing people and their public behaviors. During this time, I met several people who served as my key informants throughout the duration of the research. After this preliminary reconnaissance phase, the bulk of the research was conducted in two phases. The first phase was carried out from September to November 2011, during which time I lived in the village of Kalpa while visiting other villages in Upper Kinnaur.

The second phase was carried out in August-December 2012 and March-June 2013. When I arrived in Kinnaur in August of 2012, I secured my home stay in Kalpa and sought and hired my research assistant. Key informants were identified based on their knowledge regarding land issues and conservation in addition to community dynamics. My research was interrupted from December 2012 to March 2013 due to the severity of winter. Kinnaur generally experiences harsh winters with heavy snowfall that results in landslides, road closures, and electricity cut-off for days if not weeks at a time, and according to research participants, the winter of 2012-2013 was one of the most severe winters experienced in 80 years.

Finally, I spent three weeks in Kinnaur in April-May 2014 conducting further participant observation, follow-up open-ended interviews with key informants, and informal conversations with Kinnauris.

## Participant Observation

To learn about the multiple layers of complexity and the numerous perspectives within my research site, I immersed myself in Kinnaur by observing people and their actions and relationships. The settings in which this component of study took place included apple orchards and farms, paths around the village and through orchards, forests, and high elevation pasturelands, tea houses and restaurants, markets, roadsides, around irrigation channels during irrigation schedules, administrative offices, hamlets where Nepali migrant laborers resided, community forests, community meetings, local political activities, a horticulture seminar, people's homes, weddings, and religious and cultural functions in the temples and in sacred sites.

This initial approach provided an understanding of the area's physical environment, broader village economic structures, and social and cultural dynamics. In order to gain direct knowledge of everyday social relations (Smith, 1990), I paid close attention to the everyday lived experiences of Kinnauris, particularly to those in inferior social positions due to gender, caste, and economic status. Specifically, by observing the dynamics between people as they interacted in everyday community settings, I was able to identify people and their activities temporally and spatially in real time. I also found it very valuable to "observe and document the physical traces of human doings" (Lofland & Lofland, 2006, p. 89). This included paying attention to village paths, how people use the landscape, places where garbage was dumped or burned, and the type of garbage generated by people, and so on. This thick description of the production of life provided clues into relationships and links between components of the social system, local social networks and their structures, decision-making processes, how different individuals and groups relate to one another, and inter and intra village conflicts and dynamics.

I participated in ongoing informal discussions with my key informants about changes brought about by the apple economy and market integration. I was also fortunate to attend two ceremonies in the village of Tashigang near the Shipki La Pass on the India-Tibet border. The first was a wedding ceremony in the village, and the second was a funeral of a very renowned Buddhist Lama. The wedding activities took four days, three of which were in the village of Tashigang at the bride's home. The last day of the wedding was a gathering in the village of Namgya at the groom's family home. As there were no roads to Tashigang, attending these ceremonies entailed trekking up to the village at an elevation of above 13000 feet, in a procession of people, and participating in various rites and rituals with tens of others. After walking down the mountain at the end of the festivities in Tashigang, we packed into a procession of jeeps and drove to the village of Namgya for the last day of the wedding ceremony. These processions highlighted the difference between the inaccessible historical Kinnaur and more globalized present-day Kinnaur. These ceremonies also provided an opportunity to participate in traditional activities, meet and befriend people and learn about Kinnaur. Most importantly however, as these events took place during the first phase of research, I was able to inform people about my project, which was later to my advantage as I was better accepted by people in the community.

Participant observation provided a rich understanding of the local setting including socio-political and economic motivation behind land use, including animal rearing and grazing, collecting various resources, and working in the orchards. As many of the rights to use, access, and control of resources are often based on customary and unwritten laws that are complex, participating in people's daily activities while observing provided insight into how such customs and unwritten laws played out in real life. This method also provided significant understanding of migrant laborers, including Nepali (orchard laborers), Bihari (construction laborers), and

Kashmiris (carpenters) and their specialized traits, their use of resources, their relationship with Kinnauris, their position within the broader social setting, and how they influence the social system. I paid close attention to the village irrigation systems and patterns of irrigation, water theft, and other issues around access, use, and allocation of water. Participant observation was critical in initially devising and later continually revising my interview guide, as data gathered from this method provided invaluable information that I could not foresee in advance.

## In-depth Semi-Structured and Open-ended Interviews

In depth open-ended semi structured interviews were used with follow-up questions to gain insight into a range of issues including land use history, horticultural input and outputs, livelihood options and diversity, people's perception of development, climate change, and local politics and power structures within Kinnauri society. An additional important issue of discussion was focused on ecological, social, and economic implications of the apple economy in Kinnaur and perceptions of its future. Although my interviews were open-ended and participants were provided time to discuss topics of interest to them within the framework of the broader research, I used an interview guide which helped me with consistency. With the permission of the interviewees, the interviews were audio recorded.

## Oral histories

Oral histories, specifically in regards to the social, economic, and ecological issues over time, provide historical record on changes that have taken place in the landscape from the perspective of the elders (Rocheleau, 1995). I recorded 17 oral histories, including five with people in their 90s, who were able to speak about Kinnaur's transition from the British Raj to independence and from subsistence to cash-based economy and the implications of the apple economy on Kinnauri society and environment, vast transitions that have taken place during their adulthood.

## Focus Group Discussion

I conducted seven focus group discussions. These focus groups were participatory group discussion sessions that provided information that I may not have received in one-on-one interview sessions. The importance of focus group discussions was to obtain group consensus on changes that have occurred in livelihoods, gender dynamics, community norms, attitudes, behaviors, cultural elements, and the transition of the local economy from agro-pastoralism to a horticultural cash-based economy. Focus group discussants were chosen based on referred by my key informants. My groups included: 1) a women's weaving cooperative, 2) a group of young male adults, 3) a middle aged female group whose members were employees of the Indian Forest Service, 4) a middle aged mixed-gender group, 5) a group of young family members who were part of a polyandrous marriage union, and 6) a mixed-gender and missed-age group of family members and neighbors. Discussion topics covered an array of issues including livelihood changes, changing social mores and customs, changing family structure including thoughts on polyandrous unions and joint family system, issues related to young people and choosing higher education as opposed to working in apple orchards, expectations regarding marriage, jobs, and other societal responsibilities, changing gender roles and relations that have occurred over the last twenty years, Kinnauri women's lack of property rights through inheritance, changing workload, especially for women, including both productive and reproductive work, the availability of migrant laborers and Kinnaur's affluence, their perception

on the changing family structure and how their children are choosing to live a more modern life rather than a traditional Kinnauri life.

### Supplementary Data and Literature Review

I obtained important written material from several libraries in Himachal Pradesh including Rekong Peo Library in Kinnaur's district capital of Rekong Peo, Himachal Pradesh Secretariat Library, Census Department Library, and Indian Institute of Advanced Study Library, all of which are located in Himachal Pradesh's capital city of Shimla. From these libraries I was able to obtain 19th - and early 20th -century documents including various Gazetteers and Forest Settlement Reports, all of which painted a broad picture of life in the Himalaya and in Kinnaur prior to India's independence. I read news sources on Himachal Pradesh and Kinnaur through internet news websites and Facebook pages. Other supplementary sources of data included governmental documents, and attendance at an horticultural conference in Rekong Peo, as well as attendance of several *panchayat* (village council) and *gram sabha* (village assembly) meetings in the village of Kalpa.

## *Participant Recruitment*

Interviewees were chosen to maximize variation in my sample and provide a diverse range of perspectives from the broader population. Sampling for range is a non-probability sampling method in which respondents are chosen intentionally to include examples of important dissimilar variations in the larger population (Weiss, 1994). My interviewees were primarily selected by a combination of purposive snowball and opportunistic methods (Bryman, 2004).

Getting people in Kalpa to agree to do interviews was extremely difficult initially. People were not interested and there was a level of resistance to providing their time for an interview. Initially, my research assistant and I would contact people by phone or in person to set up a time for the interview. Almost always, people agreed to the interview, and when my research assistant would call the evening prior to our scheduled interview to confirm our visit for the next day, people would still agree and express their interest. But at the time of the interview, however, they would no longer be available. They would not be at the place of interview, or would not answer their phone, or if they did answer the phone, they would cancel due to various reasons. This was a common occurrence during the beginning stages of data collection. After inquiring, we discovered that some people believed that they had nothing to contribute and that they were not knowledgeable enough to participate in the research.

These difficulties led to a change in strategy, employing, instead, opportunistic methods of finding participants. These approaches to finding interviewees included walking around the village, going door to door, and interviewing whoever was available at the house. My only restriction was to interview those over the age of eighteen. This method worked well as I had the chance to interview a range of people, including men and women of different ages. As the interviews took place in people's homes or in their orchards, this method also provided an opportunity to observe the person's living situation. Interestingly, while employing this method, we were invited into people's home, kindly served tea, and were able to conduct our interview. Additionally, for the most part, interviewees demonstrated their interest in participating in the research.

I interviewed an array of actors in Kinnaur including those in different socio-economic and caste background, age, and gender. A range of people were recruited for interviews and focus group discussions, including community elders, orchard owners and operators, apple and

*chilgoza* pine nut contractors, *panchayat* members, official government employees, including elected officials and civil servants at different administrative levels to obtain perspectives of government administrators, field and office revenue officers, leaders of women's groups, local NGO employees, migrant wage laborers, and other important actors who had specialized and informed views about community concerns. Interviews served as further verification of the data collected from participant observation.

## *Data Analysis*

In the process of analysis, I used my data and questions interactively with my disciplinary literature. The analysis segment of research should start immediately after the data are collected (Miles & Huberman, 1984; Strauss, 1987). From the moment information is first gathered, the investigator is able to cultivate small theories to speculate about the phenomenon at hand. I therefore embarked on the process of analysis while still in the field and incorporated data analysis with data collection, as these approaches overlap greatly (Lofland, 2006).

I used what Weiss (1994, p. 153) refers to as "issue-focused" approach to analyze my data. This approach enabled me to learn about the specific processes, "issues," from all respondents who were involved in the research (Weiss, 1994). Weiss argues that issue-focused analysis will "move from discussion of issues within one area to discussion of issues within another, with each area logically connected to the others" (Weiss, 1994, p. 154). Making logical connections between different areas while still in the process of collecting data facilitated the modification of my interview questions, which I did periodically, in order to address existing gaps and weaknesses in the collected data.

Verbatim transcriptions were made of the recorded interviews, enabling detailed coding (Strauss & Corbin, 1998).

### Coding

Atlas.ti, a Computer Assisted Qualitative Data Analysis program was used to code and analyze the data. A phase of initial coding (open-ended and general questions) was followed by focused coding (conceptual and direct) (Charmaz, 2001). Coding proceeded by sorting data, where categories of information were filed in separate folders. I sorted the data into categories and sub-categories related to the concerns of this project. These categories remained fairly stable throughout the analysis, and are now reflected in the structure of the dissertation. The next step consisted of summing up the information in these separate categories. Summaries led to the construction of mini theories about each event that can potentially be developed into a larger theoretical framework. Inclusive integration subsequently interwove the various pieces of the analysis into a logical and sound account from which concluding remarks are derived.

The above approach is a common method of data analysis used in ethnographic research (LeCompte & Schensul, 1999a). It enabled me to break down collected data into smaller and more tangible sections. Analysis of each of the separate sections was followed by linking the sections with the larger phenomenon under study. Furthermore, this method of analysis is useful, as ethnographic studies generally tend to require flexibility and mutability. As the process of analysis occurred simultaneously during data collection, I was able to develop new hypotheses based on the collected data. One advantage of conducting analysis while still in the field was that I had the opportunity to test my hypotheses and was able to either accept or reject them. I was therefore, able to alter my research design while developing new questions and

hypotheses that were relevant to the collected data, which allowed me to further expand my research.

## Organization of Dissertation

This introductory chapter serves as a general orientation to this dissertation and to my broad research objectives. The chapter provides a brief background on Kinnaur, as well as the research methods with which I investigated my broad objectives.

Chapter Two, "Political Ecology of Land Tenure in Kinnaur: Land Reforms and Transitioning Power Dynamics," examines land tenure issues in Kinnaur by focusing on the implications of land reforms on the lives of Kinnauris and the expansion of the apple economy. I discuss the consequences of land reforms as part of the larger project of understanding the transformation of Kinnaur as this formerly isolated, subsistence-based community is brought into closer contact with the larger Indian state. The chapter illustrates the complexity in the process of land reforms in Kinnaur as my findings show that the results of these schemes have been mixed. I argue that while land reforms did not create equality in income or social status, many participants could trace their personal increase in prosperity to land they received under reform programs, especially under the Nautor Land Rules of 1968. Land reform was only one of the many changes affecting Kinnaur in recent decades, but it played a significant role in the growth of the apple economy and in the district's social changes, as will be discussed in the succeeding chapters.

I discuss the political, economic, and social drivers of land reforms in Himachal Pradesh from the 1950s to the 1970s that led to the current land ownership system in Kinnaur. I examine the Nautor Land Rules of 1968 in detail, as the results of my fieldwork suggest that the majority of landless Kinnauris received land under this scheme. However, I also discuss several other land programs, all of which made some contribution to improving the situation of the landless in Kinnaur. Additionally, they illustrate the complexity of Kinnauri land reform. For example, I try to show how the upper caste elite manipulated the system to maintain its landholdings despite The 1972 Himachal Pradesh Ceiling on Land Holdings Act.

My findings also illustrate that despite the inequitable distribution of land that prevailed in the 1960s and 70s, over the longer term these land reforms (and specifically *nautor*) in Kinnaur have nonetheless improved the social and economic status of the poor and shifted agrarian relations. Field and official data indicate that today the majority of Kinnauris, despite their caste and economic status, own small parcels of land from which they profit. The results of my research therefore exhibit a link between land reforms and land ownership in Kinnaur. The long-term implications of land reforms have included improvement of socioeconomic status of the poor and lower caste, and a shift in centuries-old agrarian relations. My research findings illustrate that *nautor* land reform has been an important factor in gradually providing land to the landless and therefore expanding the apple economy in Kinnaur.

In Chapter Three, "Political Ecology of Climate Change: Shifting Orchards and Temporary Landscapes of Opportunity," I examine factors that have influenced the development of Kinnaur's economy and the social status of its people. The chapter focuses on the intersection of climate change and Kinnaur's economic progress. As the global climate and local weather patterns change, the apple belt of the state of Himachal Pradesh has been migrating to higher elevation areas and Kinnaur, a formerly-isolated area has now become a desirable region for apple plantations. Forest and pasturelands that were once disfavored with limited access are gradually becoming the preferred land for expansion of orchards. Warming temperatures have

created a resource— new land for apple plantations—that Kinnauris have tapped into, enabling greater economic prosperity for those with access to this land. This chapter illustrates how climate change is shifting patterns of agricultural production and driving land use change. Although this shift is documented in other areas around the world, my research adds a new and important dimension in revealing how climate change is providing a landscape of new opportunities for Kinnauris. But there is reason to believe that these opportunities are only temporary.

As climate change unfolds, lessons may be learned from detailed attention to the specific circumstances under which climate change is beneficial or detrimental. I suggest that for Kinnaur, and perhaps other mountain regions that had previously been inhospitable, sparsely inhabited, and marginalized, climate change has had favorable outcomes *thus far*. To this point, the consequences of these changes include improving the lives of people and changing elements of the Kinnauri society including better standards of living, better access to education, health care, better access to the larger Indian market, as well as the broader global economy, with few obvious negative impacts. But balanced against these climate-related gains, my research reveals that there are emerging risks as well for Kinnauris – including increased potential for extreme weather events, depletion of thin upland soils with limited organic matter, declining productivity of lower elevation orchards, increased exposure to agricultural pests and diseases, and potential decline of glacial water sources.

I investigate patterns in the larger transformation of Kinnaur, both those induced by climate change and those that depend on the processes and consequences of state policies for remote mountain populations. This chapter thus explores the intersection of marginality, the apple economy, and climate change and discusses the socioeconomic changes that have occurred, and are currently occurring in Kinnaur.

Chapter Four, "Continuity and Change: Livelihoods and Collective Social Arrangements," provides an examination of Kinnaur's social dynamics and their evolution. I examine ways in which market integration of the past seven decades has had fundamental ramifications on the Kinnauri social structure, which has been in place for generations. I examine Kinnaur's social transition by providing specific examples rooted in strategies of collective action and decision-making which have been important function of Kinnauri adaptation and survival. By providing a set of examples, I describe traditional practices and social networks of reciprocity and exchange at the household and broader village levels. These complex cooperative and interdependent social networks supported Kinnauris in their harsh mountain environment and alleviated risk and environmental uncertainty. The examples illustrated in this chapter include the social institution of fraternal polyandry, networks of traditional cooperative labor arrangements, and common pool resources such as the *chilgoza* pine nut. These examples demonstrate broader social transition in Kinnaur.

I observe that the declining institution of fraternal polyandry is linked to land partition amongst siblings, turning small land parcels into even smaller units with possible insufficient production capacity to support a household. Continuous land division and scarcity of overall land resources is therefore linked to encroachment into highland forest and pasturelands. For my second example of cooperative labor, I maintain that the weakening of social networks of cooperative labor is gradually increasing individual action and decision-making. My third and final example is centered on Kinnauri common pool resources. I show that the decline of the *chilgoza* pine nut, an important common pool resource in Kinnaur, has already had important implications in the ecology, economy, and cultural heritage of Kinnaur. Flexible relationships and social networks

based on reciprocity and cooperation help with reducing risk in a region with land, resource, and labor scarcity. These relationships also add to livelihood diversification. This chapter investigates these evolving strategies in light of increasing market penetration while examining the sustainability of new patterns of change.

In the final chapter, Five, I conclude this work with a brief discussion of implications of this research going forward.

# Chapter Two: Political Ecology of Land Reforms in Kinnaur and Transitioning Power Dynamics

## Chapter Introduction

### *Prelude*

We were heading northeast on National Highway 22 (NH22) about 30 minutes beyond the village of Pooh driving toward the Shipki La[5] Pass on the India-China (Tibet) border. It is through this area along the border that the mighty Sutlej River enters India from Tibet draining the Kinnaur Valley of the Indian Himalayan state of Himachal Pradesh. Unlike the section of the NH22 west of Pooh, where villages sprinkled the vast Himalayan landscape, this section of the highway close to the border was desolate, with no sign of other villages. There were however, signs of military encampments and construction equipment and debris along the river and on the road. We were now above the tree line, driving through the barren high-altitude landscape of the Trans-Himalaya. The road, the national highway, no more than a narrow dirt road, meandered on the left bank of the Sutlej River. This section of the river is wild and as yet, the river has not been obstructed by dams. On both sides of the narrow valley, massive yet fragile Himalayan Mountains soar to the sky. We frequently passed piles of rocks of varying sizes that had been collected and removed from the road by the drivers before us or by the bulldozers, a reminder of the recurrent landslides that block the road so frequently that they are expected by those who drive these roads. The mountains felt alive here with their continuous movement.

We finally arrived to our destination, a lovely patch of greenery positioned perfectly next to a narrow waterfall amidst barren Himalayan mountainsides. There, perched on the other side of the Sutlej River, was my respondent Ajay Prakash's[6] apple orchard. Buddhist prayer flags danced in the wind, spreading their prayers through the orchard and beyond. I had driven past this orchard several times before and each time marveled at its beauty. I wondered how people crossed the river to tend its apple trees, as there was no sight of bridges or baskets for crossing.

When we stepped out of the vehicle, we were greeted by a cold biting wind sweeping through and raising the infamous Himalayan dust, which soon covered us and the parked vehicle. We walked down the side of the cliff to a small post attached to a rope with its far end attached to a similar post on the other side of the river. Ajay Prakash took out an old dusty sling from an old duffle bag—nothing more than several pieces of thin and fraying belts connected to old rusty buckles. His companion quickly wrapped the sling around his thighs and waist and fastened himself to the rope; he then began to pull himself across the wild roaring tumultuous waters. Once on the other side, he sent the sling back and one-by-one we each made the journey across the river. As I was crossing over the roaring waters feeling utterly excited and exhilarated, I wondered how my professors at UC Berkeley would have reacted had they seen me dangling over this wild Himalayan river on my way to collect data for this research.

The orchard consisted of 17 *bighas*[7] (about 3.5 acres) and was purchased by Ajay Prakash's father in 1969 as a resting place for his shepherds and sheep. This was a time when

[5] "La" is a Hindi word that is translated to "pass." Shipki La therefore means Shipki Pass.
[6] To protect the identity of those interviewed, I have changed all names to pseudonyms.
[7] One *bigha* is a traditional measurement of a unit of land and land purchases still occur in this unit. It is used in various states in India and other neighboring countries and its precise size varies. In the state of Himachal Pradesh, five bighas (about 5.377 to be exact) are equal to about one acre or 0.40 hectare.

the cash economy was just beginning to gradually spread in Kinnaur and most people still did not have access to money. But Ajay Prakash's father was a trader and owned a large herd of animals with which he had ventured on trade migrations to Tibet up until the 1962 Indo-China war, and so he had the means to purchase this once barren land. He had purchased the land and received its title from another shepherd who used the area as a grazing ground for his sheep in the summer time. Ajay Prakash's father paid the shepherd 500 Rupees, one transistor and a female yak. In the 1970s, when the commercialization of apples was beginning in Kinnaur, Ajay Prakash's father planted about 50 apple trees in this orchard. According to Ajay Prakash, these trees were not planted in a proper and technical manner. His father simply stuck the apple saplings in the ground as he knew little about apple horticulture, which was a new practice in Kinnaur. This was similar to other accounts I had heard about the beginning of the apple plantations.

Subsequently, in 1998, when apple orchards had already been replacing all other traditional crops and fruit trees in Kinnaur and money was more readily available to most Kinnauris, Ajay Prakash planted another 150 trees. The apple trees on his land were healthy and robust, displaying the care and love that was put into the orchard. Ajay Prakash is growing organic apples, which is uncommon in Kinnaur. We walked near the waterfall where one end of a small black plastic pipe, about three centimeters in diameter, was carefully fixed in the water. My eyes followed the pipe that crossed the orchard in the air. It traversed the river and the road on the other side of river, and from there the pipe was pulled up over the mountain ridge, where it passed out of sight. I had seen similar long stretches of plastic pipe over roads, through the forest, and up or down hillsides around Kinnaur. Ajay Prakash informed me that the pipe was pulled to his friend's orchard in the village of Namgya for which it was the only source of irrigation in this arid region of Upper Kinnaur. To me, the pipe reflected the great lengths people will go to make productive the small scraps of cultivable land to which they have access. Ajay Prakash is fortunate in that he has access to an unlimited source of water to irrigate his orchard and so is not subject to the complicated village irrigation schedules with limited water. Additionally, securing ownership of 17 *bighas* of land in 1969, and planting 50 apple trees, helped the family with a smooth transition from its subsistence existence to a cash based economy. This was at a time when the government was implementing land reforms to provide ownership rights to Kinnaur's landless population. Arable land is a precious resource in this rocky barren Himalayan region.

## *Introduction*

Prior to the 1950s and the ascent of the apple economy in Kinnaur, tribal Kinnauris were primarily subsistence agro-pastoralists. Many, like Ajay Prakash's father, especially in Upper Kinnaur, also depended on cross-border trade[8] with their Tibetan neighbors. Other Kinnauris subsisted as peasant[9] cultivators tilling the fields of the upper caste landowning class including those of the ruling *Rajas*[10] and *Wazirs*[11]. This agrarian relation began to change as India attained

[8] Kinnauris served as intermediaries between the Indian plains and the mountain areas of Tibet, Spiti and broader Central Asia (Singh, 2003a). The Kinnauri pastoralist traders were vital to the local and regional economy. From Tibet they brought wool, cumin, medicinal herbs, salt, borax, goats and sheep in exchange of cereals and cotton clothing in barter (Singh, 2003a).

[9] For the purpose of this paper I use the term "peasant" and "peasant cultivator" to refer to rural landless and marginal land holder agriculturalists.

[10] *Raja* is a ruler or a king.

[11] *Wazir* is an Arabic word referring to a high-ranking minister or advisor; also spelled *vazir, vizir, and vasir*. The *Wazirs* were the ministers of the *Rajas*.

Independence in 1947. As part of its state-making strategy, what is today the Western Himalayan state of Himachal Pradesh undertook numerous development approaches, including a shift away from subsistence agriculture toward market-oriented horticulture specifically centered on apple production.(Vedwan, 2001) Simultaneously, a multitude of land reforms were legislated aiming to distribute land to the landless peasant cultivators. While these land reforms may not have achieved the egalitarian aims of the government that enacted them, they played a significant role in shaping Kinnauri life and Kinnaur's apple economy.

Land reforms in the state of Himachal Pradesh commenced in the 1950s, aiming to address poverty and increase agricultural productivity. The process of land allocation, however, began disproportionately. As in other districts of Himachal Pradesh, the upper caste elite sector of society exploited land reforms to benefit itself (Mehta, 2006). As my research demonstrates, rather than improving social hierarchies and systems of exclusion, land acquisition in its initial phase merely reflected the existing status. At the outset, the marginalized and landless populations of Kinnaur, unlike the politically connected elite, had limited access and ability to navigate the bureaucratic system of land acquisition. They also lacked sufficient resources to engage in commercial horticulture, which was, in many cases in Kinnaur, a requirement for receiving a land grant[12]. However, my findings also illustrate that despite the inequitable distribution of land that prevailed in the 1960s and 70s, today the majority of Kinnauris have become landowners[13].

Data on the implications of land reforms in Kinnaur are not available. Scholarly work has however, documented the success of land reforms in Himachal Pradesh as a whole (Bhatnagar, 1981; Das, Kapoor-Mehta, Tas, & Zumbyte, 2015; Drèze & Sen, 2002), and specifically *nautor's* success in other districts of the state (Davidson-Hunt, 1996a; Mehta, 2006). Difficulty in accessing official public records of landownership in Kinnaur prevents my making exact quantitative statements about ownership numbers in this research. My varied sources of data, however, including numerous interviews, observations, and informal conversations with Kinnauris, provide an oral history of land reforms in Kinnaur and establish a baseline upon which other research may be built.

My field data suggest that land reforms in general and the *Nautor* Land Rules of 1968 in particular, were instrumental in providing land to the majority of landless Kinnauris. My data imply that because of the effort of different land reforms, there are few completely landless Kinnauris. In my research, in which I attempted to interview people from the widest possible range of circumstances, all 127 Kinnauris interviewed owned land. According to a former Deputy Commissioner in Kinnaur, the highest-ranking government official in the district, today about two percent of the entire population is completely landless (Personal communication, May 2016). The state of Himachal Pradesh began implementing different land reform in the 1950s.

[12] As will be discussed below, one of the requirements of land allocated under *Nautor* Land Rules was that land with a gradient of more than 15 percent had to be placed under horticulture. This requirement applied to mountainous Kinnaur with steep slopes.

[13] Officially, those who own up to five *bighas* of land (.40 hectare) are considered "landless." Marginal landholders are those with less than one hectare (2.47 acres) or about 12.35 *bighas.* And small landholders are those with one-two hectares (2.47- 4.94 acres) of land. Semi-medium holders are those with between two to four hectares. Medium landholders own between four to ten hectares (9.88-24.71 acres), while large landholders are those with ten hectares (24.71 acres) and more.

Allocated *nautor* land was carved out of government wasteland[14], or what was classified by the Indian Forest Department as undemarcated Class III forest, which was located outside of villages and was considered marginal with low agricultural productivity. This land however, has been suitable for apple orchards in Kinnaur.

During *nautor's* 30-year span, geo-political circumstances and state-led development interventions prompted a major economic transition in Kinnaur. These changes, which I will discuss in detail below, provided the Kinnauris with better means to acquire land through *nautor*. *Nautor* land reform has been an important factor in gradually engendering broader socioeconomic transformations by providing once-landless Kinnauris with access to means of production. With the gradual expansion of the apple economy, people gained better access to cash and information, as well as subsidized agricultural/horticultural schemes that were being provided by the state government. Subsidies have included for example, farm and orchard equipment, chemical sprays and fertilizers, land improvement schemes, and development of water storage containers. The long-term effects of land reforms have included improvement of the socioeconomic status of the poor and landless, and a shift from their semi-feudal agrarian relations to being independent landowners.

This chapter analyzes the short and long-term social and economic implications of land reform programs in Kinnaur, specifically their impact on land ownership, and the expansion of the apple economy. I examine the *Nautor* Land Rules of 1968 in detail as the results of my fieldwork suggest that it was through this program that the majority of landless Kinnauris received land. I also include some discussion of several other instrumental land programs that were implemented after India's Independence, all of which also made some contribution to improving the situation of the landless in Kinnaur. This chapter addresses the impact of these land reforms on the lives of Kinnauris, as part of the larger project of understanding the transformation of Kinnaur as this formerly isolated, subsistence community is brought into closer contact with the larger Indian state, and as the area experiences the effects of climate change.

The District of Kinnaur in the tribal belt of the state of Himachal Pradesh provides a valuable opportunity to investigate land reform policy, and its effects on poverty and distribution of wealth and property over time. The region started from a baseline of highly concentrated land ownership, and then experienced decades of efforts to improve economic growth and social equity through land reform policies. No other scholarly work has been conducted on the consequences of land reforms in Kinnaur. My research, and additional work building upon it, could illuminate the effectiveness of these policies as well as other implications (social, cultural, environmental) of land re-distribution. Further, an understanding of Kinnauri agrarian structure is critical to understanding social and economic status, family relations, and labor relations. It therefore provides an important foundation for understanding other processes unfolding in Kinnaur – such as the increasing exposure of Kinnauris to mainstream Indian culture through tourism, labor migration, and education, as well as climate change.

## Land Reform and Land Tenure Scholarship

Land with its multifaceted attributes encompasses power relations, linking political, economic, social, and cultural issues (Borras, 2007). In addition to being a source of production,

[14] These wastelands were areas that were originally under the village common lands or the *shamilats*. Wasteland is generally considered as less productive and it must be developed first before it can be used for any agricultural or horticultural purposes (Agrawal, 2010).

land provides status, and power, especially in a rural setting such as Kinnaur. Ownership and access to land can lead to empowerment for the local poor by providing options to build an asset base, and therefore improve their economic condition, as was the case with Ajay Prakash and his father above. In agrarian societies, like that of Kinnaur, despite the livelihood diversification adopted by local people, prosperity and social life still revolve around land and farming activities. Land reforms aim to change power dynamics within a society by reorganizing the existing tenurial system and therefore reshaping economic and social hierarchies (Borras, 2008; Griffin, Khan, & Ickowitz, 2002). In addition to changing people's rights to property therefore, land reforms may change and reform social relationships (Tsing, 2002) and provide power to the powerless (Herring, 2003). This point is evident in Himachal Pradesh as a whole, where 60 years following the implementation of land reforms, there is low caste disparity and social differentiation, and low incidence of poverty and landlessness (Bhatnagar, 1981; Das et al., 2015; Davidson-Hunt, 1996b; Drèze & Sen, 2002). Despite 90 percent of its population living rurally, in the 2011 Indian Human Development Report, the state of Himachal Pradesh ranks third after Kerala and Delhi in its human development (Das et al., 2015). I will provide detailed data in the Himachal Pradesh section below.

Land reforms can alter agrarian structure of a society by transferring wealth in the form of landed property from the large private landed class to the landless peasantry (Bruce, 1998; Griffin et al., 2002). Ghonemy (1990) has argued that land reform is an effective policy related to the redistribution of land in an effort to create some equilibrium in the distorted land holding patterns, transfer wealth from landlords to poor cultivators, and provide more available opportunities to the poor. Effective land reform, in addition to providing land to the landless, creates opportunities including "access to the productive assets of land, credit, and water" and therefore, can aid in poverty alleviation (El Ghonemy, 1990, p. 8).

Herring (2000) argues that restructuring the property system in rural areas and access to land is an intentional method to tackle poverty. Other scholars similarly argue that having access to land plays an important role in people's livelihoods and therefore in poverty alleviation in rural agrarian areas (Borras, Kay, & Akram-Lodhi, 2005). Besley and Burgess (2000, p. 389) contend that enhancing the asset base of the poor rural agrarian societies by "improving the terms on which the poor have access to land" is a "central" approach to poverty alleviation. My research in Kinnaur supports these claims that land reform can improve the economic situation of the impoverished.

Borras (2006) observes that critics of state-led agrarian reforms assert that such reforms have yet to improve rural development and eliminate poverty. He argues against this simple generalization, writing that those in support of state-led reforms "have explicitly maintained no illusion that land redistribution is a magic panacea to rural poverty and underdevelopment," but that "land redistribution is a necessary but insufficient condition of rural development and poverty eradication" (Borras, 2006, p. 112). According to an analysis conducted by Borras and McKinley (2006) on a set of country studies, it was recognized that pro-poor growth is not attainable without accelerated rural development, which in turn is difficult to attain without proper land reforms (Borras & McKinley, 2006).

To be successful, land reform must tackle multiple issues of justice, equity, and growth simultaneously (Thiesenhusen, 1996). Thiesenhusen (1989) explains that when land is redistributed, a simultaneous reform of related institutions is necessary. Broader institutional reform will guarantee "that services, inputs, research, irrigation water and facilities, credit, and marketing assistance go to the beneficiaries of land reform" (Thiesenhusen, 1989, p. 7). If

associated institutions are left unchanged during land redistribution, then land reform efforts will have difficulty succeeding (Thiesenhusen, 1989). These claims seem to be borne out in the early history of Kinnaur, in which the elite and politically connected were able to benefit the most from land reforms and related programs aimed at helping the poor.

Equitably implemented land reforms can lead to growth in agriculture and overall economic status leading to a better quality of life and providing better access to services such as education and health care. Land reform can thus lead to an overall better human development. In the absence of socio-political changes, land reform by itself will not bring about fundamental change. Land reform should disperse land ownership concentration, and include removal of landlord bias, as well as diminish the power of institutions that prevent the "material and human development of the poor" (Griffin et al., 2002, p. 317). "A successful redistributive land reform is thus likely to be only one part of a comprehensive effort to reduce … human poverty. Land reform in this broader context is extraordinarily difficult" (Griffin et al., 2002, p. 317).

The empirical evidence on the effectiveness of land reform is mixed. Some examples of countries where land reforms were implemented with some measure of success with pro-poor social policies in mind, including providing health care, education, and state support in the rural market economy (i.e., state-led assurance of equitable distribution of farm inputs and marketing facilities), have included Taiwan (1940s-50s)15, South Korea (1940s-50s)16, China (1940s)17, Cuba (1950s)18, and the state of Kerala19 in India. In these cases, a reduction of rural poverty was witnessed. Land reform in South Korea and Taiwan were carried out concurrently with economic reforms. These countries both received financial and technical backing from the US (Barraclough & UN Research Institute for Social Development, 1999; Courvilee & Patel, 2006). In both cases, significant social and economic improvements were achieved. In the cases of China, Cuba, and Kerala, social demand and revolutions led to land reforms that included more widespread agrarian reforms with the intent of reducing poverty and inequality (Courvilee & Patel, 2006). In countries where land redistribution efforts took place on a large scale as in China, Taiwan, and South Korea, better success with poverty alleviation has been achieved than in countries where land redistribution occurred on a smaller scale (Borras, 2006). Additionally, in Cuba and Kerala, the degree of the reduction in poverty has been notable and tied to land reform efforts in those areas (Borras et al., 2005; Herring, 1983, 2003).

Conversely, although both Bolivia (1950s) and Mexico (1910s-1930s) had some initial success, which provided extensive benefits to their peasant populations, post-reform efforts failed to maintain that success. The Bolivian case initially resulted in an increase in food production and consumption by its peasant population, though the marketed surplus shrunk. Subsequently, the importation of highly subsidized cheap food took attention away from peasant development policies and the peasantry was abandoned after land reform. The consequences of Mexico's land reform of the 1930s, resulted in increased peasant production as well as peasant income at the time mainly because "Credit, marketing, technical assistance and similar state institutions were created or redirected to serve reform beneficiaries" (Barraclough & UN Research Institute for Social Development, 1999, p. ii). The failure of both cases was mainly

[15] For detailed discussion of land reform in Taiwan, see (Chen, 1961; Koo, 1968; Kuo, Fei, & Ranis, 1981).
[16] For a better understanding of the South Korean land reform refer to (Ban, Mun, & Perkins, 1980; Borras, 2007; Klein, 1958).
[17] For a discussion of land reform in China, see (Griffin et al., 2002).
[18] For a better understanding of land reform in Cuba and Bolivia, refer to (Kay, 1998).
[19] For a detailed discussion of land reform in Kerala, see (Borras et al., 2005; Herring, 1983, 2003).

due to the state's support in commercial agriculture produced by private farmers on massive scales and eliminated the peasants from "playing a dynamic role in post-reform developments" (Barraclough & UN Research Institute for Social Development, 1999, p. ii). As such examples illustrate, the results of land reform are uncertain.

## *Mechanisms of Access*

Ribot and Peluso's (2003) access framework reflects the complex social relations, and resource challenges that have resulted in rights and access to land described by my Kinnauri respondents. Ribot and Peluso (2003) make a distinction between property rights and access (Ribot & Peluso, 2003). A property right is one set of many access relationships. Property is related to the *right* to benefit, as opposed to access, which is the *ability* to benefit from a resource. Ability is associated with power (Ribot & Peluso, 2003). As will be discussed in following chapters, changes in Kinnaur have led to problems with illegal encroachment on private and public lands by those with access but not rights. Ribot and Peluso (2003) argue that access may be more significant than rights that are obtained formally. The ability to extract resources enables people to sustain their livelihood, and rights are important so long as they provide such ability. For example, having rights to a common irrigation channel may be insignificant to a person without land to plant an orchard that can benefit from the irrigation. The understanding of who has the ability to benefit from a given resource provides a clearer analysis of social relationships within a community.

Access is shaped by social relations and social identities, force, and power—whether legal or illegal—which govern the use and control of any given resource (Ribot & Peluso, 2003). Ribot and Peluso (2003) use the bundle of rights approach to property to describe the bundle of powers related to access. They discuss a range of mechanisms or powers that "shape access processes and relations" and allow individuals or groups to benefit from resources (Ribot & Peluso, 2003, p. 161). Mechanisms of access are used to gain, control, and maintain access by individuals, groups, or institutions "within particular political and cultural circumstances" (Ribot & Peluso, 2003, p. 161). Among mechanisms of access are rights-based access, and structural and relational access. Rights-based access is defined by "law, custom, or convention," and often custom and convention allow access where law may not.

Structural and relational mechanisms of access include the ability or hindrance to benefiting from a resource due to political, economic, and cultural dynamics (Ribot & Peluso, 2003). These mechanisms grow out of access to larger social structures and relationships such as markets, capital, technology, authority, labor, identities, knowledge, and social relations (Ribot & Peluso, 2003). Having access to markets, for example, will affect the ability to benefit commercially from a resource to which one has access, and may be more important than having a right to the resource (De Janvry, Patteau, Gordillo, & Sadoulet, 2001; Ribot, 1999, 2000).

Wealth is a key determinant of access to resources. Wealth is enabled by power, and wealth and power are mutually reinforcing, which enable maintaining and controlling access, or having influence over those who control access to resources (Ribot & Peluso, 2003). As wealth brings about power and social status, those who have wealth may also have better access to various opportunities, exchange, and production (Ribot & Peluso, 2003).

To have control over resources is to have the power to manage the access of others to that resource. Those who control access to resources may cooperate or clash with others, "or do both at different moments or along different dimensions" (Ribot & Peluso, 2003, p. 173). This is also true for those who "must maintain their access *through* those who have control" over the

resource (Ribot & Peluso, 2003, p. 154). A wealthy upper caste male member of a village irrigation committee, who is also a member of the temple committee, has a great deal of power in maintaining his own access to irrigate his orchards regularly. Simultaneously, he is able to control (and especially limit or forbid) the access of others, especially those who are socially inferior to him. Access is maintained by exerting power through wealth, providing therefore, "privileged access to production and exchange, opportunities, forms of knowledge, [and] realms of authority" (Ribot & Peluso, 2003, p. 166). The interrelationship of wealth, power, and social identity is one of the critical features in the contemporary history of land reform in Kinnaur as will be discussed below.

In the following section, I focus on land reform in India. After a brief history of general land tenure systems in India pre and post-Independence, I will examine the historical land tenure system of Kinnaur. The brief historical examination of Kinnaur will lay the foundation on which to provide analysis of contemporary issues related to land and land reform in the area.

## A Historical Examination of Land Tenure and Agrarian Relations in Kinnaur

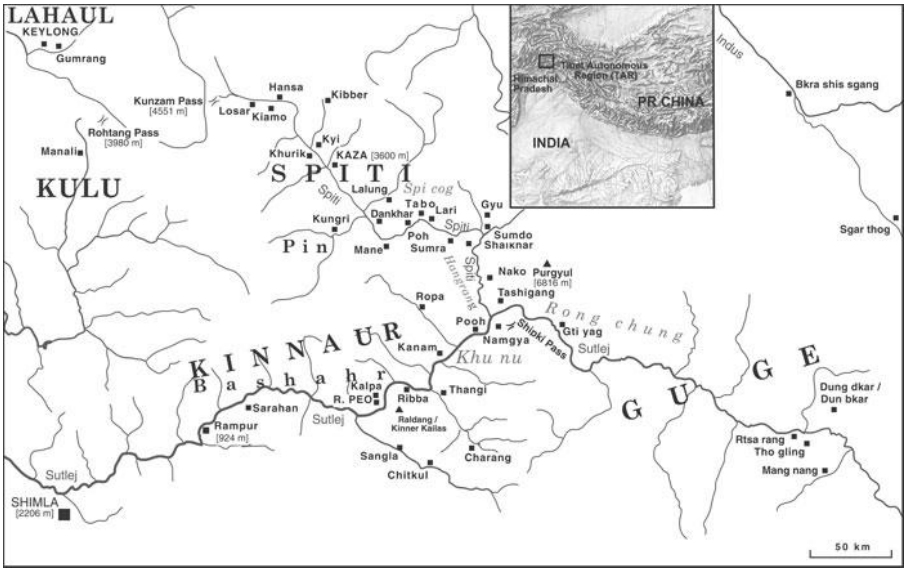


**Figure 3: Map of Kinnaur under the Bashahr Empire in Western Himalaya**

Source: (Jahoda, 2008)

What is today the District of Kinnaur in the state of Himachal Pradesh was historically under the rule of the Rampur-Bashahr Empire[20] (Figure 2 ) whose rulers reigned from the 13th century until India's Independence in 1947 (Moran, 2007; Verma, 2002). In 1815, the Rampur-Bashahr Empire became a British protectorate (Bajpai, 1991). During this time, what is currently the state of Himachal Pradesh was administered in two different ways by the British. Much of the area was part of the District of Punjab, and many of the hilly mountainous areas were administered as part of princely states (Tucker, 1986). Princely states, or native states as they were called by the British, were indirectly controlled by the British. Although the foreign policies[21] of these states were completely under the control of the British, these states had a great deal of autonomy in regards to internal administration (Iyer, 2003). Kinnaur was part of the Princely State of Rampur-Bashahr which, prior to India's Independence, was the largest kingdom

[20] Also referred to as Bashahr Empire

[21] Meaning that the princely states had no right to make independent decisions related to foreign or defense policies (Iyer, 2003).

in Western Himalaya (Moran, 2007). The British exerted control over the princely states through the traditional *Rajas* (Iyer, 2003). Under the circuitous rule of the British, a revenue settlement and taxation system was devised for the Bashahr Kingdom. Since the *Raja* was the proprietor of all lands under his rule, the British were indirectly in control of all Bashahr land and resources, specifically the area's forests (Moran, 2007).

According to official British colonial documents including land settlement reports and gazetteers (Lyall, 1874; Shimla District Gazetteer, 1911), as well as other scholarly work (Ahluwalia, 1998; Tucker, 1986; Verma, 1995), the *Rajas* of the Rampur-Bashahr Empire were the superior decision makers and superior owners or the *Ala Malik,* of all lands under their principalities (Ahluwalia, 1998; Tucker, 1986). Individual ownership of land did not exist and all land belonged to the Supreme *Raja* (Lyall, 1874). Inferior ownership, or *Adna Malquiyat,* was awarded to the cultivators during the first regular Settlement in 1891-1892, though this status was only bestowed to larger cultivators of the upper castes (Malik & Nirwal, 1989; Singh, 1989).

Next to the *Raja* was the *Wazir*, a high-ranking minister. The *Wazirs* also belonged to the land-owning class who claimed their seat of power hereditarily (Moran, 2007). The *Wazirs* had judicial and revenue power in the areas under their rule and were rewarded by the *Raja* with *jagir*[22] (estate) (Rahul, 1969). They served as intermediary rulers between the *Raja* and the rest of the population and were responsible for revenue collection and implementation of the *Raja's* orders (Shimla District Gazetteer, 1911). In the Bashahr State there were three *Wazirats*, ruled by three hereditary *Wazirs*; they were the Powari,[23] Kohal, and the Shua *Wazirs* (Shimla District Gazetteer, 1911). The Powari *Wazir* was in charge of the area that is Kinnaur today. Though this system of the *Wazirat* ended at the time of Independence, people of Kinnaur still remember this arrangement and the agrarian relations that existed under the *Rajas* and the *Wazirs'* rule, "The *Raja* was the owner of all lands and the *Wazir* was under the *Raja*. If the *Wazir* did good work, he was granted land by the *Raja*" (Key Informant Interview, April 2014). Those who served the *Raja* and "were in the state's service," such as the *Wazirs*, and those who served the temples in different villages, were granted revenue-free land by the *Raja;* they were also exempt from participating in the *beggar*[24] or forced labor system (explained further below) (Bajpai, 1981, p. 105).

Although the right to cultivate the land was bequeathed by inheritance to families (Tucker, 1986), the peasant cultivators of the land were considered tenants of the land (Verma, 2002) and were not allowed to sell or mortgage the land unless this right was sanctioned by the *Raja* himself (Shimla District Gazetteer, 1911; Singh, 1989). Cultivable land was divided among village households for which they had to pay a certain amount of tax in kind (Cunnigham, 1844). The right of the cultivators to the land was secured through a title deed called *patta*, which was provided based on the conditions of prompt revenue payment by the cultivator (Verma, 1995). The hereditary right to cultivate the land was conditional upon "its proper cultivation and the regular payment of the state dues" (Mehta, 2006, p. 42). The *Wazirs* collected revenue from each household and presented it to the *Raja* (Cunnigham, 1844). The revenue to the *Raja* was

[22] *Jagir* is a Farsi word, derived from Sanskrit. *Ja* refers to place and *gir* means to take. *Jagir* means possessing or occupying a place or land. *Jagir* was a land grant awarded to the *Wazirs* by the *Rajas*; the person receiving the *jagir* was a *jagirdar.* The *jagirdari* system resembled the *zamindari* system.

[23] Powari is a village above the Sutlej River in Kinnaur. This is where the Powari *Wazir* resided.

[24] *Begar* is a traditional system of forced labor which was later exploited by the British. For a thorough study on the *begar* system in the Shimla Hill states, see (Datta, 1997; Negi, 1995a).

generally based on the quality of the land and the amount it produced and it was mostly in the form of grain, oil, or *ghee* (clarified butter), and alcohol (Singh, 1989; Verma, 1995).

The cultivators were also required by the *Raja* to work the land under what was called the *begar* system (Singh, 1996). Under the *begar* system, each household was obliged to provide the *Raja* with a soldier as well as a servant whenever it was required by the *Raja* (Cunnigham, 1844). The *Raja* then, not only had superiority over land, but to "physical labour and to all spheres of economic activity as well. The idea was that everything belonged to the Raja, including the individual's capacity of physical labour" (Singh, 1989, p. 99). This land tenure arrangement of the Bashahr Kingdom was later adopted by the British to ensure easy revenue collection and exploitation of resources (Tucker, 1986).

The land tenure system of the princely states of Himachel Pradesh prior to Independence "may broadly be categorized as feudal" (Mehta, 2006, p. 42). Although the agrarian system in Kinnaur was not officially called a *zamindari*[25] system, in practice it closely resembled this arrangement. When I conducted field interviews, specifically during oral histories with elders, respondents frequently used the terms *zamindari* and *zamindar* to refer to the land owning class of the pre-Independence period. For example, one key informant explained the agrarian relation under the *Raja* that existed prior to Independence:

> The way it worked was that those who worked on the land were the peasants. They worked in the fields and they harvested the crops. The crops that were harvested had to be given to the *Raja* and other *zamindars*. After the *Raja* took the bulk of the harvest, what was left behind in the fields could be collected by the peasants. They [peasant cultivators] were like slaves[26] of the *Raja* and the *Wazirs*. Very limited number of people in every village owned their own land (Key Informant Interview, April 2014).

## Post- Independence Land Reform Programs in India

After India's Independence in 1949, the Indian Constitution granted each state the right to enact and implement state-led land reforms, although the central government encouraged land reforms in numerous Five-Year Plans and issues of land reform have remained on the country's policy agenda (Besley & Burgess, 2000; Mearns, 1999). The principal motive of post-Independence land legislation in India, as noted in the First Five Year Plan, was poverty alleviation and economic growth, with emphasis placed on ending the oppression of tenant cultivators by the landlord class, and increasing the productivity of the land (Bandyopadhyay, 2008). The rural peasantry in India, including in Kinnaur, was entangled in different semi-feudal agrarian systems and relations (Sethi, 2006). Most of the land ownership was under the control of landlords (such as the *Rajas* and the *Wazirs* in Kinnaur) and intermediaries who demanded maximum rent in cash or kind from their tenants. After India's Independence, agrarian reforms were initiated to alter these production relations, and to further develop the agriculture sector in India.

The aim of land reform was also rooted in issues of social justice and equity (Sethi, 2006). India's First Five-Year Plan was formally launched in 1951-1952. The Plan was mainly

[25] *Zamindar* is a Farsi word that literary means "holder of land." *Zamindars* were similar to feudal lords, landlord or barons, though in some states such as the Punjab and what is today Himachal Pradesh, they were Princes with sovereign and independent power. The *zamindari* system was based on landlordism or feudalism.

[26] By "slaves," this interviewee is referring to peasant cultivators who worked for a landlord and were obliged to hand over most of their cultivated crop to the landlord.

centered on agricultural development with an emphasis on land issues including eliminating the *zamindari* system and the institution of intermediary lessees, and bestowing the tenants of the landlords a secure tenure system (Bhatnagar, 1981). As most of the land tenure system was in the hands of the land owning class under the *zamindari* arrangement, eradicating the traditional *zamindari* system was one of the most important agrarian reforms that took place in all of Independent India.

Land reform issues were emphasized in India's Fourth Five-Year Plan (1969-1974). The emphasis here was on limits for individual land holdings and the redistribution of the surplus land to the landless populations (Bhatnagar, 1981). Land legislation endeavored to address three general problems, two of which, eliminating landlordism, or the *zamindars*, and tenant-cultivator protection had already been confronted in the First Five-Year Plan and were being renewed. The third issue was the redistribution of surplus land through landholding ceilings (Panagariya, 2008; Sharma, Sharma, & Kumar, 2006). For example in 1975, during her Prime Ministerial term, Indira Gandhi declared a state of emergency[27] that lasted two years. During this time, without any constitutional restrictions, she plowed ahead with the implementation of a range of social and economic reforms (Jaffrelot, 2003). These national programs targeted, amongst other goals, a comprehensive land reform including lowering the limit of land ceilings with the objective of redistributing the surplus land to the landless particularly targeting north India (Jaffrelot, 2003). Priority was to be provided to the agricultural laborers, specifically those within the Scheduled Castes and Scheduled Tribes category (Das, 1993). Every household in the state of Himachal Pradesh owning fewer than five *bighas* of land was to receive up to this amount (about 1 acre or 0.40 hectare) under this national program (Emmanuel, 2000; Mehta, 2006). Much of this land was allotted to the landless from wasteland in the village commons under the 1974 Himachal Pradesh Village Common Land Vesting and Utilisation Act (Singh, 1989), which I discuss in detail below. During this time, agricultural growth followed an institutional model, though growth also included some emphasis on the technocratic model (Panagariya, 2008). "On the institutional side, the strategy placed emphasis on land reforms and farm and service cooperatives, while on the technocratic front, it included irrigation and… research and extension" (Panagariya, 2008, p. 41). Over the years, horticulture has become an important sector of agriculture and economic development, especially in mountainous areas such as in Himachal Pradesh (Verma & Partap, 1992).

Despite India's effort in implementing land reforms, the overall process of redistributing land through legislating a ceiling on landholdings has been complicated and problematic, mainly due to the political failure of implementation (Besley & Burgess, 2000; Das, 1999; Mearns, 1999). On the other hand, enhancing smallholder tenurial security and diminishing the power of absentee landlordism and the intermediaries such as the *zamindars*, have been more successful (Besley & Burgess, 2000; Das, 1993).

## Land Reforms in Himachal Pradesh and Kinnaur

Prior to statehood, what is today Himachal Pradesh consisted of its current districts of Kangra, Kullu, and Lahaul and Spiti, which were part of the neighboring Punjab Province and

[27] The details of the emergency are beyond the scope of this paper. In brief however, Gandhi's declaration of the emergency was due to legal proceedings regarding her reelection and criminal charges against her (Leaf, 1985). National emergency was declared as a measure to stop corruption and to contend with economic problems, although during this time all civil liberties were suspended.

were administered directly by the British (Bhatnagar, 1981). The merging of these areas with Himachal Pradesh proved problematic in terms of implementation of land reforms, as discussed below, as each of these areas were under different land reform acts that lacked uniformity (Bhatnagar, 1981; Mehta, 2006). This problem was overcome when in 1971 Himachal Pradesh became a state of the Indian Union (Verma & Partap, 1992).

The leaders of newly formed Himachal Pradesh, most of whom belonged to the landlord class, perceived the subsistent agricultural model of the hill state of the time as primitive and perceived the neighboring Punjab[28] model of market-oriented agriculture as one to emulate (Vedwan, 2001). Himachali politicians saw market-oriented agriculture and horticulture, and adoption of cash crop cultivation as an approach for economic development of the hill areas. It was understood that the small landholding sizes and the low productivity of the land created an impracticable setting for growing grains for profit, especially compared to the production capacity of the plains area (Vedwan, 2001). Additionally, the state was trying to increase the overall agriculture efficiency and output (Saravanan, McDonald, Horen, & Ip, 2010; Singh, 1996).

At the time of Independence, Himachal Pradesh, like other areas in the country, was suffering from low agricultural productivity (Bhati, 1990; Verma & Partap, 1992). Low productivity was directly tied to the existing land tenure regimes and the social relations of the time. In 1953, about 80 percent of the tillers were landless (Thakur, 2005). They were tenant farmers or share-croppers with no ownership ties to the land, having little interest or economic motivation in improving the land to increase output (Bhati, 1990; Singh, 1989). The landlord *zamindars* too had little desire to enhance the economic condition of the peasant cultivator and thus the overall agricultural yield was low (Sethi, 2006). Agrarian reforms were therefore a top priority of the politicians, specially the Congress Party, of the time (Vedwan, 2001; Verma, 1995). To attain these goals, the state of Himachal Pradesh implemented a series of land reforms intended to 1) grant ownership rights to peasant cultivators; 2) reduce land holding size disparities; 3) reduce land fragmentation through land consolidation; and 4) allocate land to the landless.

Additionally, between 1956 and 1961, during Himachal Pradesh's Second Five-Year Plan and the beginning stages of land reform implementation, various research and training programs were established to bring more efficiency to the agricultural sector of the state and to begin training people in the newly introduced horticultural schemes (Bhati, 1990). Government Horticulture farms in addition to the Regional Horticulture Research Stations and nurseries that supplied fruit tree saplings on a large scale and at a subsidized rate were established across the state (Bhati, 1990; Panwar, 2011). Additionally, the government established a fertilizer scheme during Himachal's Third Five-Year Plan from 1961 to 1966, which has continued distributing fertilizer into today (Bhati, 1990).

Tucker (1997, p. 31) writes that "A high priority for the state government from the 1960s onward was a new definition of social justice: the ancient disabilities of the landless and Untouchables must be overcome, in part by granting them ownership of agricultural land." Beginning in the 1950s Himachali politicians began to debate issues of poverty, especially as they pertained to the Scheduled Castes (lower caste Untouchables), Scheduled Tribes[29] (Mehta,

[28] Punjab was one of the first Indian states to experiment with technologies of the Green Revolution.

[29] In 1949 the Indian Constitution created a broad category for underprivileged peoples of India. This category of people was to receive special administrative and welfare provisions and constitutional rights. It comprised

2006), and the state's other landless populations. By 1952, the Scheduled Castes and Scheduled Tribes constituted 26 percent of the Himachal's population (Mehta, 2006). Another of the government's objectives was that land tenure should be devoid of exploitation (Singh, 1996). These new political ideas were especially relevant to Kinnaur as the district is considered a Scheduled Area with all Kinnauris falling under the category of Scheduled Tribe.

Similar to state-led reforms taking place around India after Independence, in Himachal Pradesh efforts to provide land to the landless through agrarian reforms and other development strategies were underway. To develop a better agricultural economy, a fundamental transformation of the agrarian organization was necessary (Bhati, 1990; Verma & Partap, 1992). Laws were ratified to effect land reform beginning in the 1950s in order to shift agrarian relations and to engender economic transition. As will be demonstrated in the following sections, although many of these programs resulted in economic disparity, especially in the first decades after Independence, their overall long-term outcome has been successful in the state of Himachal Pradesh (Drèze & Sen, 2002), and for Kinnaur in particular. Post-Independence development strategies in addition to land reforms in Himachal Pradesh have resulted in the lowest incidence of landlessness among the major states in India (Drèze & Sen, 2002; Singh, 1996; Thakur, 2002).

Today, about 80 percent of the population of Himachal Pradesh possesses some land with distribution between social groups more equitable than compared to its neighboring states and India in general (Das et al., 2015). The average landholding size in Himachal Pradesh is about one hectare with 87.97 percent of the plots categorized as marginal (less than one hectare) and small (one – two hectares), 11.71 percent are semi medium (between two - four hectares) and medium farmers (between four - ten hectares), and about 0.34 percent are categorized as large (above 10 hectares) (Government of HP Department of Economics & Statistics, 2014-2015). Unlike other states in India where the Scheduled Castes hold marginal plots of land, in Himachal Pradesh the pattern of land ownership across different social groups including Scheduled Castes and Tribes is more equitable (Das et al., 2015). Additionally, unlike other states where the Scheduled Tribes hold small parcels of land, the tribal populations of Himachal Pradesh, including the Kinnauris, hold relatively large parcels. The average landholding size in Kinnaur, for example, is 1.37 hectares (Government of HP Department of Economics & Statistics, 2012-2013) reflecting their more equitable socio-economic status compared to other tribal areas in India. Although it is unlikely that the benefits of land reform are uniform, land redistribution can result in a more equitable distribution of income in a society, thus resulting in poverty reduction, as is evident in Himachal Pradesh as a whole and Kinnaur in particular.

Although the state of Himachal Pradesh implemented numerous land reforms, in the following section, I will focus on those that pertained to Kinnaur and briefly explain each. I provide an in-depth analysis of the 1968 *Nautor* Land Rules and the 1972 Himachal Pradesh Ceiling on Land Holdings Act. I discuss other land reforms in brief here as my overall review of their consequences suggests that they have had importance in Kinnaur.

It is imperative to mention that to date, Kinnaur lacks a thorough ethnographic study of the historical processes of land ownership and the social, economic, and ecological implications of land reform programs, specifically on Nautor Land Rules. Against this backdrop, my analysis has been based on my own fieldwork in the district, in addition to scholarly work and historical documents on other districts of Himachal Pradesh.

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Scheduled Castes such as untouchables, all tribals or "Adivasis," and other economically disadvantaged groups all of whom fall under the Schedule V and VI of the Indian Constitution.

## *1953 Himachal Pradesh Abolition of Big Landed Estates and Land Reform Act*

The 1953 Himachal Pradesh Abolition of Big Landed Estates and Land Reform Act was one of the first major land reforms in Himachal Pradesh[30] (Government of HP Department of Revenue, 2015). Under this Act, a ceiling was placed on landholding size in order to redistribute the surplus land to the landless, and provide secure land tenure in the form of ownership to peasant cultivators who had been tilling the land up to then (Mehta, 2006). This act provided proprietary rights, especially to occupancy tenants, those who had been occupying the land for longer than 12 years and paying no rent beyond land revenue (Bhatnagar, 1981). Individual large landlords and erstwhile rulers with land sizes incurring annual revenue of 125 Rupees or more were to transfer their excess lands to the tenants upon a payment of compensation (Government of HP Department of Revenue, 2015; Mehta, 2006).

To resist this Act, some large landlords challenged the constitutionality of the act and prevented its full implementation until 1962 (Mehta, 2006; Sethi, 2009). Additionally, according to Mehta (2006), after 1962, the Act also received opposition from within the ruling Congress Party, which may have also rendered it ineffective. Despite these limitations however, this Act did nonetheless initiate weakening of the *zamindari* system (Bhatnagar, 1981; Malik & Nirwal, 1989). By the 1970s, all forms of the *zamindari* system had been eliminated not just in Himachal Pradesh, but practically all over India (Bhatnagar, 1981; Mehta, 2006). Prior to the formation of the state in 1970, in the old areas of Himachal Pradesh, which included Kangra, Kullu, and Lahaul and Spiti of the Punjab Province, 281 of the 286 large estates were abolished, with the remaining five going under litigation in court (Government of HP Department of Revenue, Undated; Mehta, 2006). This resulted in about 57,000 tenants receiving proprietary rights (Government of HP Department of Revenue, Undated; Mehta, 2006). Further, because of this Act, a total of 3,503 acres of land in Himachal Pradesh was taken from 1,105 religious institutions and occupancy tenants became proprietors of the land (Mehta, 2006).

In Kinnaur only the village gods—or, in more practical terms, the temples and their representatives and administrators[31]— were affected by the Himachal Pradesh Abolition of Big Landed Estates. In addition to practicing both Hinduism and Buddhism, the Kinnauris strongly believe in a set of deities who live in the village temple and rule much of social life. Some of the deities own large parcels of land which had been endowed to them by the *Rajas* prior to Independence: "The Raja had conferred land holdings upon them [deities] so that they would remain his allies and act as agents of legitimation of royal authority" (Singh, 1989, p. 112). Additionally, the deities also received land as gifts from the *Wazirs* and other large landlords. These temple lands were tilled by Kinnauri tenants who paid a share of the produce to the temples and who lacked proprietary rights to the land, but had hereditary rights to cultivate the land, as long as they paid their dues to the temple. Most of the tenant cultivators of the Princely States of Himachal belonged to the lower castes.

According to Singh (1990), the 1953 Himachal Pradesh Abolition of Big Landed Estates affected five large estates in Kinnaur, all of whom were village deities (Singh, 1990). The power

[30] Though started in 1953, this Act came into implementation in 1955.

[31] The temple committee members belong to upper caste affluent families whose main duties, according to Singh (1989), was to preserve "the position of the *Rajas* under whom they could continue to hold their social prominence undisturbed" (Singh, 1989, p. 89). Singh (1989, p. 89) further writes that the deities were used by the *Rajas*, especially in remote areas such as Kinnaur, as the *Raja's* "representative for manifesting royal presence."

of the temple may have been why the deities possessed large amount of land. Under this legislation "9,113 acres of their [deities] lands were declared surplus and vested in 2,284 tenants who had been cultivating them. 885 acres of land were left in these *devta's*[32] possession" (Singh, 1990, p. 250). This type of tenant cultivator system is no longer prevalent in Kinnaur[33]. If these numbers are accurate, two interesting issues stand out. First, the large amount of land held under the ownership of the village deities indicates the degree of power held by the village temples and the committees that control the affairs of these institutions. And second, the land grants to tenant cultivators averaged a little over three and-a-half acres of land, which is significant considering that the current average land holding size in Kinnaur is about 3.4 acres (1.37 hectares) (Government of HP Department of Economics & Statistics, 2012-2013).

## The 1968 Himachal Pradesh Transfer of Land (Regulation) Act

The 1968 Himachal Pradesh Transfer of Land (Regulation) Act has also been significant land legislation for the tribal Kinnauris. This Act was implemented by the government of Himachal Pradesh to protect the lands of tribal peoples against dispossession and land alienation, and to advance social welfare in these areas known as the tribal belt of Himachal Pradesh (Parmar, 2011; Thakur & Sharma, 2012) . Under section 3(1) of this Act, the Scheduled Tribe population of Himachal Pradesh is legally barred from the transfer of land in the tribal areas to a non-tribal person (Government of HP Department of Revenue, 1968b). This includes transfer of land through sale, mortgage, lease, or gift. Respondents of this research asserted the importance of this act as it keeps the already limited cultivable lands of Kinnaur in the hands of Kinnauris.

## Nautor Land Rules, 1968

*Nautor* is actually a traditional practice in the state of Himachal Pradesh. Traditionally, the villagers grazed their animals in the village common lands, or the *shamilat.*[34] These were areas from where the village head or elders, under the supervision of the *Raja,* provided land to the landless for agricultural purposes. This traditional practice—the provision of common land to landless for purpose of cultivation— was called *nautor* (Hobley, 1992). This practice of *nautor* was documented by the British in the beginning of the twentieth century. In the Forest Settlement Report of the Sutlej Valley for 1916, 1917, and part of 1920, traditional *nautor* is described as "New land broken up for cultivation" (Glover, 1921, p.7), referring to the formerly uncultivated land given to the landless and subsequently cultivated by them.

Later in 1968, under the Himachal Pradesh Nautor Land Rules 3(a), *nautor* as an official state policy has been defined as:

> The right of utilise [sic] with the sanction of the competent authority, waste land owned by the Government, outside the towns, outside the reserved and demarcated protected forests, and outside such other areas as may be notified from time to time by the State Government in this behalf for any of the purposes, mentioned (Government of HP Department of Revenue, 1968a, p. 491).

[32] *Devta* is a Hindi word meaning deity. *Devas* are the male deities and *devis* are the female deities.
[33] Although in some villages, such as Kalpa, households gather to collectively work on the orchards belonging to the village deity and receive a portion of profit after the harvest.
[34] *Shamilat*, sometimes also referred to as *Shamilat bhoomi*, were village commons. *Bhoomi* is literally translated to land. Under the British, the *Shamilat* were classified as marginal wastelands.

Under *nautor* land reform policies of 1968, up to 20 *bighas* (about four acres) of land per family was to be granted to those who owned fewer than this amount to increase their maximum landholding size to 20 *bighas.* Priority for land allocation was to be given to the landless and marginal landholders,[35] Scheduled Castes and Scheduled Tribes, and those who had lost a family member during military service. *Nautor* Rule (8) dictated that in cases where the husband or the father remained alive, the wife or children were ineligible to apply for *nautor* land separately. And, after the father's death, *nautor* land was to be divided equally among the sons. Widows could apply to *nautor*, as had a female participant in this research. However, under the Kinnauri tribal customary law, or *Wajib-ul-urz*, Kinnauri women are barred from owning property, and under *nautor*, as stated above, until the father or husband's death other members of the family were ineligible to apply. In the case of the following female interviewee, her *nautor* land will be transferred to her son.

> We only found out about *nautor* because other people were applying, so we applied too. I didn't know anything. I am illiterate. I applied for *nautor* in 1996 and we got sanctioned in 1998. Yes, it was very difficult as we were not capable. But the *Pradhan*[36] was very nice in those days and he helped us get the two *bighas* of land (Interview, November 2012).

*Nautor* land was allocated from undemarcated Class III forests, which are under the category of "wasteland," parts of which were under the village common lands or the *shamilats*, a category of land generally considered less productive. Nautor Rule 5(f) stated that land under *nautor* was to be used for specific non-forest purposes which included horticulture, agriculture, and construction of buildings for residence or for agricultural purposes,[37] and "for genuine public purposes like construction of Dharamsala"[38] (Government of HP Department of Revenue, 1968a, p. 491). Under *nautor* Rule (10), land with a slope of more than 15 percent was not to be granted for any other purposes but for "horticulture, raising of fodder, growing of special grasses, herbs, shrubs, trees" (Government of HP Department of Revenue, 1968a, p. 493). This last rule is of particular significance in Kinnaur as much of the land is situated in high elevation terrain with steep slopes.

Once the land was sanctioned under *nautor* for horticulture, the grantee was required to develop the land, i.e., to plant the land with fruit trees, within two years. Rule 12(b) states that the *nautor* application would be cancelled without compensation if the applicant failed to make required developments. Government fees for *nautor* land varied depending on the grantee's social classification. For the Scheduled Tribes groups such as the Kinnauris, five Rupees per *bigha* of allocated land was charged by the state (Government of HP Department of Revenue, 1968a, p. 492). This fee however, did not include the value of trees on the land. *Nautor* Rule (9) explicitly details the required steps for the grantee regarding the trees on the *nautor* land. Note (1) under Rule (9) states: "any trees standing on the nautor land… will be chargeable at the

[35] In Kinnaur, landless is considered to be those who hold less than five *bighas* of land (.40 hectare). Marginal landholders are those with less than one hectare (2.47 acres) or about 12.35 *bighas.* And small landholders are those with one-two hectares (2.47- 4.94 acres) of land. Medium landholders own between four-ten hectares (9.88-24.71 acres) of land, while large landholders are those with ten hectares (24.71 acres) and more.
[36] *Pradhan* is an elected head of the village *panchayat*, or village council.
[37] Agricultural purposes included thrashing floor, water mills and water channels.
[38] *Dharamsala* is a Hindi word referring to a resting house for pilgrims, or a religious rest house.

market rate in addition to the nazarana[39] of the land, in case the grantee chooses to buy them." Further, Note (2) under Rule (9) states: "In case where the grantee is not interested in the trees, the Forest Department shall arrange to dispose them off within six months of the sanction and the nautor land cleared of the tree [sic] within another six months" (Government of HP Department of Revenue, 1968a, p. 493). Although Nautor Rules were implemented under the Revenue Department, the Forest Department was also an involved institution in this process.

A *nautor* application entailed a lengthy administrative procedure. Broadly, the process necessitated the applicants to first identify and select the plot in the area designated as government wasteland. Subsequently, field visits by numerous revenue officials were undertaken to measure and demarcate the selected land, objections and approval of the selected plot had to be provided by the village *panchayat*,[40] and finally, the Forest Department had to assess the trees standing on the land. According to interviewees, at best, this process was completed in one year.

After the Forest Conservation Act of 1980 was passed, *Nautor* Land Rules were to officially be brought to an end. Under this Act, no forest land was to be used for non-forest purposes, which included clearing of land for horticultural purposes. However, the state of Himachel Pradesh continued the implementation of *nautor* in Kinnaur until 1998 when a Supreme Court order prohibited the further granting of *nautor* land. Today, there are still thousands of *nautor* cases pending in Kinnaur.

## Initial Stages of *Nautor* Implementation and the Landless

At the outset, unlike the politically connected elite, many of the marginalized had little access to information regarding the land reform in the first place. According to participants, this was especially true for those whose villages were not yet connected by link roads and were far from the administrative center. For example the following participant only learned about *nautor* and other programs during the process of partitioning his land: "I have six other brothers. When my father died in the early 1980s, my brothers and I divided our land. I only learned about *nautor* during the partition process" (Interview, November 2012). Additionally, even if information about *nautor* was disseminated properly, participants expressed that one reason landless people were incapable of maneuvering the bureaucratic system was that many at the time were illiterate and the application process was intimidating to them. In the 1970s and 80s education was still not widely accessible, and Kinnaur had a sizeable illiterate population. According to the 1971 census, only 27.70 percent of the population of Kinnaur was literate. In 1981 this number jumped to 37.02 percent. By 1991, people's economic condition had gradually improved from the apple economy with more people having access to education and hence 58.36 percent of the population was literate (Verma, 2002). Some illiterate families declined to apply for *nautor* as the bureaucratic application process was too daunting. One interviewee's story encapsulates the experience of illiterate people with *nautor* I commonly heard. At the time, this man and his family were extremely poor and whilst he had a small piece of land, he was financially unable to develop it. He had become a merchant by starting a small shop that was based on credit from larger merchants that were based outside of Kinnaur. He had slowly

[39] *Nazarana* comes from the Arabic word *nazr*, literally meaning gift or offering. *Nazarana* was a form of land rent that was imposed on the peasant cultivators. Today, the word can describe the value of the land or resources on the land. It can mean payment or fee.

[40] Village council; the *panchayat* is the smallest official institution of self-governance in India whose members are elected every four years.

expanded his business, but had experienced obvious hardship in creating his current position. When I asked him why he never applied for land under *nautor*, he replied:

> I have never received even 10 *paisa*[41] from the government. Since I am illiterate, I was not able to communicate with the government officials regarding *nautor* and the paperwork, so I did not bother to go from office to office, and so I didn't apply (Interview, November 2012).

The story of this man reflects what happened to many landless poor and marginalized people of the time. I heard narratives similar to this man's from other participants. At the time, the village of Kalpa, near where this man resided, served as the administrative headquarter of Kinnaur.[42] It is surprising that this interviewee's geographic proximity to Kinnaur's political and administrative center, and his social relationships through his interactions in his small shop, one of the first in the area, did not produce better accessibility to the bureaucratic administrative system for obtaining land under *nautor*. Interviewees who lived farther away pointed out the additional difficulty in taking time away from tending to their fields to visit government departments to pursue the application process. Similar accounts were prevalent in other districts of Himachal Pradesh. For example, according to Tsering (2014), who conducted his research in the Spiti Valley, a district neighboring Kinnaur, educated men with political connection benefitted more from *nautor* than did women, or people of lower castes .

Another significant theme that was regularly expressed by interviewees was related to the amount of land people requested under *nautor*. Participants stated that during the first decade of *nautor* implementation, landless people who did manage to apply for *nautor* requested small amount of land, for example, between one to five *bighas* of land (up to one acre). This was despite the permissible maximum eligible amount of 20 *bighas*. The first reason for a modest request can be attributed to the psyche of the marginalized group. For example, when interviewing officials from the Forest Department, one official's statement echoed what others confirmed:

> Before the poor person applies to *nautor*, he only has a small piece of land. So, it is partly psychological; if one already has small land, for example, less than one *bigha*, one is not going to ask for 20 *bighas*. He will ask only for a small piece. This is due to both psychological and financial factors. Even the Forest Conservator [of the time] was puzzled and asking why are [poor] people not applying for more land? (Interview, November 2012)

The second reason, as revealed by participants, was strictly financial. As mentioned above, *nautor* Rule 12(b) required that land granted for horticultural purposes be planted with fruit trees within two years from the date of the *patta* or registration or the land registration would be rescinded and the land retracted by the government without any compensation to the grantee (Government of HP Department of Revenue, 1968a). According to participants, this rule deterred the poor from claiming the entire 20 *bighas* of land allowed by the *nautor* rules. The

[41] *Paisa* is a monetary unit. One hundred *paisa* equal to one Rupee

[42] In 1990 the town of Rekong Peo, about eight kilometers away from Kalpa became the new district capital of Kinnaur.

steep, rocky terrain of Kinnaur requires significant effort, cost, and time to prepare it for a terraced fruit orchard. Interviewees claimed lacking sufficient funds to improve the land within the two-year period. And although at the time there were a number of land development and improvement subsidies provided by the state, the subsidies were available in the form of reimbursements (Interview with Soil Conservation Department Official, 2012, 2013). Landowners had to initially invest out-of-pocket and were thus unable to take advantage of such subsidies. Similar experiences were faced by people in other districts of Himachal Pradesh and other parts of India where recipients of land reforms had received poor quality land and lacked the resources necessary to cultivate the land (Jodha, 1986; Thakur, 2002).

The interview excerpt of the widow from above reflects many of these points. She only learned about *nautor* through other people who were applying. As she stated, she applied in 1996, very late in *nautor's* history. Additionally, despite being eligible to apply for 20 *bighas*, she had only applied for two *bighas*. Developing and planting two *bighas* of land within two years was a much easier undertaking than doing the same for 20 *bighas*, which would have been impossible for her at ht time.

In contrast to the experience of the marginalized landless, the wealthier and politically connected section of the population had a different experience with *nautor*. According to interviewees, wealthy Kinnauris with their political connections were amongst the first to learn about reforms and thus were able to take better advantage of such programs. Unlike the poor, they were often educated and literate and had access to information, knowledge, and wealth. In other words, they had access to wealth which included capital, equipment that could be used for converting and developing the land for production, labor, "and other processes associated with deriving benefits from things and people" (Ribot & Peluso, 2003, p. 165). Again, as much of *nautor* land was considered wasteland and required to be developed into terraced fields for horticulture, it necessitated initial investments, whereas the land that was allocated from surplus ceiling was generally available for immediate cultivation and was of better quality (Agrawal, 2010). Furthermore, according to interviewees, as the wealthy elite were amongst the first applicants, they carved out the best cultivable parcels available, for example, land that was near water sources such as irrigation *khules,*[43] or near a road with better access to the market. Interview data suggest that by the 1980s and 1990s when most Kinnauris, especially those belonging to the lowest socio-economic class, were able to fulfill the *nautor* requirements, much of the better quality *nautor* land had already been apportioned to the early upper class applicants.

When discussing *nautor* land and its allocation in Kinnaur, participants revealed similar accounts as the following key informant, a top employee in a government office related to land issues, who responded:

> People who were clever took advantage of *nautor* in the 1970s and 80s and took land. But people who did not know about the policy did not apply. The policy was first captured by high profile people who first captured all the good lands, the cultivable lands. Those people who were in politics, like the village head, they were the ones who first took the available land. Then they advertised the land and the *nautor* policy to their own friends and families so all of them took *nautor* land next. These people all took the best available lands first (Interview, September 2012).

[43] *Khule* is an irrigation channel.

By using adjectives such as "clever" and "high profile," this respondent is referring to those with access to information in addition to political associations that provided them the opportunity to acquire land before others. This claim is also supported by the literature on the topic in the Kullu District of Himachal Pradesh, "The 1970s saw many *nautor* grants by the Revenue Department, under persuasion from local political representatives" (Tucker, 1997, p. 32).

Interviewees also alleged cases of bribery or manipulation of the system. For example, I was told repeatedly that while selecting *nautor* land, the revenue officials were bribed to provide better quality land. According to Singh (1989), during his research in Kinnaur he heard many stories regarding larger landlords taking advantage of *nautor*. "Influential people thoroughly misused these Rules with the full connivance of officials" (Singh, 1989, p. 115). Bribing was done during different stages of the application process. Generally, a powerful person belonging to the elite domain was able to deal with lower-level officials easily. These were common stories disclosed to me in the field.

## Long-Term Outcome of *Nautor*

As I have demonstrated here, the initial implementation of *Nautor* Land Rules was mired in challenges, irregularities, and manipulation of the system by the locally influential political elite (Mehta, 2006). *Nautor,* nonetheless, achieved its goal of providing land to the landless in Kinnaur, and Himachal Pradesh broadly, "It went a long way in eradicating landlessness particularly among the Scheduled Castes and Schedule Tribes" (Mehta, 2006, p. 54). In Himachal Pradesh a total of 17,000 acres of cultivable wasteland[44] was allocated to the landless (Mehta, 2006). My data, based on my interviews, observations, and informal conversations in Kinnaur, suggest that the landless population began receiving land in the 1980s and 1990s. As mentioned above, *nautor* application was open until 1998, some 30 years after it was signed into legislation. During this time, Kinnauri society experienced numerous changes, many of which gradually provided the poor landless the means necessary, mainly cash and information, to apply for *nautor*.

In the 1960s and throughout the 1970s fundamental occupational shifts began to take place in Kinnaur. Commercial apple cultivation was first adopted by the upper caste elite, and others gradually followed suit. The Indo-China war of 1962 led to the immediate construction of a strategic national highway through Kinnaur and to the border areas. At the time of construction, which was completed in 1973, most Kinnauris had very little access to cash. The road building effort required a massive labor force, which was fulfilled by Kinnauris as wage laborers earning a cash-based income, however meager, for the first time. Further, participants stated that with the road in place, they were better able to travel outside of Kinnaur where they were also employed as laborers working in the well-established apple orchards of the neighboring Shimla District, earning not just wages, but also experience in orchards. Participants also spoke of working as laborers in Kinnaur on the orchards of the early adopters.

Another source of cash was the use of animals to transport apple boxes to the markets. As pastoralism had been a significant source of livelihood activity in Kinnaur, many families owned animals, especially mules, which had previously been used to transport goods during trade migrations to and from Tibet. I was told by interviewees that after the construction of the national highway and the closure of the Indo-China border, mule owners earned cash by

[44] This includes land available for cultivation, regardless of it being under cultivation.

transporting apple boxes to the markets in Rampur and onward to the city of Shimla. At the time, Kinnauris did not own vehicles and when the orchards of the early adopters began to produce fruit by the 1960s, much of it was transported to the markets outside of Kinnaur on mules[45].

These different sources of labor gradually provided Kinnauris with cash, which was vital for the establishment of orchards. Access to cash allowed people to apply for small parcels of land under *nautor,* improve and develop their land into terraced orchards, purchase apple saplings, and transport the harvested fruit to the markets outside of Kinnaur. With some variation amongst the precise numbers used by interviewees, I repeatedly heard sentiments like this: "If someone had 10 *bighas*, he would first plant one *bigha* with apples to make money. After the first profit, people would develop more *bighas*. This happened gradually as people received more and more money" (Interview, November 2012).

Additionally, participants expressed how laborers not only earned wages, they also gained access to valuable information that helped better maneuver the bureaucratic world of government programs. Exposure to the world beyond their own village brought people out of isolation and provided them with information regarding available reforms, including *nautor*. Also, during this time, the number of schools increased providing children with basic education[46]. Better access to education in time provided families with the ability to complete the application process. By laboring in the apple orchards of others, Kinnauris acquired expertise in horticultural techniques. Horticultural training on established orchards facilitated an easier transition than experimenting with an entirely new crop. Further, due to their Scheduled Tribe status, Kinnauris benefitted from reservation policies that have been put in place by the Indian government to promote equal opportunity in access to employment and higher education. Data suggest that government jobs during this time provided Kinnauris with additional wages.

By the end of *nautor* implementation in 1998, the social and economic status of marginalized landless Kinnauris had improved as they acquired land. *Nautor* Land Rules of 1968 succeeded in facilitating a broader transformation of agrarian relations and narrowing the gap between different social groups. Although I do not have official data, I was told by numerous research participants, including government officials and key informants that the number of "completely landless" people in Kinnaur is very low. According to a former District Deputy Commissioner of Kinnaur[47], today about two percent of people fall under the category of completely landless (Personal Communication, May 2016). While my data may have been biased due to selection procedures, all my respondents (127 interviewees) owned land, and many of these landowners attributed that ownership to these policies.[48] Ownership of land has enabled the Kinnauris to improve their socio-economic status by using the land, an instrument of production, and engaging in the broader apple economy. Interestingly, observations and interviews, suggest that Kinnauris no longer participate in labor work. As their lives have improved economically, they now hire migrant laborers to tend to their apple orchards.

As demonstrated here, despite many of *nautor* problems in its implementation, this land reform has nonetheless achieved its long-term goal of providing land to the landless. This has been the case for the state of Himachel Pradesh as a whole. In her discussion of the Kullu

[45] The scale of wages involved in these income opportunity activities is beyond the scope of the present research.
[46] Official data on the number of school and number of pupils in Kinnaur prior to 1990 are not available.
[47] Highest head of district government
[48] But those 'landless' individuals typically own small parcels that can support at least a small garden, and more often a small plantation of apples.

District of Himachal Pradesh, Davidson-Hunt (1996, p. 32) writes that land reforms have "to some extent" shifted the pre-Independence agrarian structure under which the *zamindars* were the land owning class and the lower castes belonged to the landless class. And that land reform in her village of study "has accomplished the stated goals more successfully" by providing land to the lower caste households (Davidson-Hunt, 1996b, p. 72). Davidson-Hunt (1996) maintains that in her study area, similar to what occurred in Kinnaur, many of the upper caste people received land during *nautor*. In many cases, the landlords also evaded surrendering their land beyond the limited land ceiling. At the time of her study however, she writes that land ownership was more equitably distributed than prior to Independence (Davidson-Hunt, 1996a). Similarly, in the Himachali District of Kangra, Bhatnagar (1974) also discusses the shifting conditions of the lower caste due to land reforms. Regarding the Scheduled Castes he writes, "recent land reforms—which conferred upon them proprietary rights in the lands which they tilled … have improved their social and economic conditions to a great extent" (Bhatnagar, 1974, p. xix). As in Kullu and Kangra, my data suggest that people belonging to the lower castes of the Kinnauri society gradually gained access to land through land reforms, specifically sanctioned by *nautor* land rules. As apple trees require about a decade to produce fruit, and developing the land is costly and time consuming, gaining substantial income from the land requires patience.

## *The Village Commons and the 1974 Himachal Pradesh Village Common Land Vesting and Utilisation Act*

Another land scheme that affected the people of Kinnaur was the 1974 Himachal Pradesh Village Common Land Vesting and Utilisation Act. This Act complemented the *Nautor* Land Rules of 1968 and the 1972 Himachal Pradesh Ceiling on Land Holdings Act. Under the Village Common Land Act, the control of village common lands, or *shamilat/Shamlat* lands were transferred from the village to the state to be distributed to the landless, mainly to the Scheduled Caste and Scheduled Tribe populations of Himachal Pradesh (Davidson-Hunt, 1995; Sethi, 1991; Tucker, 1997). Under the British, the *shamilat* lands or village common lands were classified as undemarcated Class III land. These lands were considered 'wastelands' or lands with a high vertical gradient that were difficult to put under the plow and were therefore devoid of providing substantial revenue to the British. After Independence, these wastelands were returned to the village councils to be used as common lands and ultimately came under the purview of the Revenue Department (Saxena, 1988). Because this type of land was of lower quality, it was not used for agriculture, but for animal grazing and collection of fuel wood from the scrub forest by the village community. As the state of Himachal Pradesh still had not fulfilled its goal of providing land to its rural population of landless and marginal farmers, in 1974 under the Village Common Land Vesting and Utilisation Act, the state took control of the *shamilat* lands (Agrawal, 2010; Mehta, 2006). Fifty percent of this land was to be allotted to the landless and the other 50 percent was reserved as grazing lands (Emmanuel, 2000; Mehta, 2006). The transfer of the *shamilat* lands to the state opened up available lands to be granted to the landless under *nautor*[49]. According to Agrawal (2010), by 2005 the government of Himachal Pradesh

[49] Though an in-depth study of the *shamilat* or wastelands is beyond the scope of this research, the conversion of these lands from village commons to private holdings may have had several implications. As these wastelands were used for grazing animals, their absence may have been one of many factors motivating a gradual reduction in the number of animals held by villagers. Additionally, as wastelands were areas where villagers collected fodder, loss of wastelands for fodder may have given rise to intensification in lopping of standing forest trees.

had distributed 17,000 acres of wasteland to the landless (Agrawal, 2010). Due to my inability to access land records for Kinnaur, and insufficient research on land reform issues in the district, data for Kinnaur is missing.

## 1972 Himachal Pradesh Ceiling on Land Holdings Act

Although in 1953 the Himachal Pradesh Abolition of Big Landed Estates Act was implemented with the aim of placing a ceiling on land holding concentration, the larger land owning class, the erstwhile nobility, still possessed vast amounts of land through deceitful means. Because the 1953 Act was based on individual ownership, by the time Ceiling on Land Holding Act was legislated in 1972, the larger landowners had transferred their excess land beyond the imposed ceiling limit to their family members, thereby preventing the government seizure of their land (Mehta, 2006). Additionally, when they did relinquish the land, much of it was poor quality and marginal (Mehta, 2006). Another problem was that since parts of Himachal Pradesh had been merged with areas that belonged to the neighboring Punjab, there was an inconsistency in land reform laws and the ceiling amount (Bhatnagar, 1981; Mehta, 2006). This lack of uniformity created a situation that enabled the landlords to evade the seizure of their land. Mehta (2006, p. 51) writes that by 1972 "It was realized that social inequalities could not be removed unless ceiling was imposed on land holding and the surplus land was distributed among the landless and marginal workers."

The 1972 Himachal Pradesh Ceiling on Land Holdings Act consolidated the existing ceiling-related laws and placed a fixed ceiling amount on land holding size so that the surplus could be redistributed to the landless. Under this Act, a family of five members, including a husband, wife, and their three minor children, could possess land under one of the following categories: up to 10 acres of assured irrigated [50] land that could produce two crops per year, or 15 acres of assured irrigated land that could produce one crop per year, or 30 acres of any other type of land (Government of HP Department of Revenue, 1972). Families with more than three minor children were provided more land, and each adult son was considered a separate unit[51]. Also, section 4 (4) of the Act states that "Every adult son of a person shall be treated as a separate unit and he shall be entitled to the land up to the extent permissible to a family" (Government of HP Department of Revenue, 1972). "Other type of land" included orchards which at the time were mainly owned by large landlords, most of whom belonged to the Congress Party which was in power in Himachal Pradesh until 1977 (Bhatnagar, 1981; Vedwan, 2001). Bhatnagar (1981, p. 464) writes that, "The maximum possible latitude therefore seems to have been given to the big landlords."

In the tribal belt of Himachal Pradesh which included all of Kinnaur and Lahaul-Spiti Districts, Pangi and Bharmaur areas of Chamba District, and Chhota Bhangal and Bara Bhangal areas of Kangra District, a ceiling of 70 acres per tribal family was put into place (Department of Revenue, Government of Himachal Pradesh). The excess land was to be provided to agricultural laborers and those with possession of less than one acre of land. I will further discuss this legislation by providing an example of the Powari *Wazir* from Kinnaur.

[50] Assured irrigation indicated that the land would have access to irrigation provided by the government.
[51] These land reform laws that granted land to each family may have contributed to the decline of polyandry and motivated an increase in monogamous marriages, which is a subject that will be discussed in greater length in chapter Four.

## *The Powari Wazir: an Example of Resistance to Land Redistribution in Kinnaur*

The village of Powari[52] sits across the Sutlej River from the District Capital of Rekong Peo. This was the home of the Powari *Wazir* who was in charge of what is today the District of Kinnaur. Prior to Independence, the Powari *Wazir* was one of the largest landowners in Kinnaur. The late *Wazir's* two sons and their families still live in Powari in their ancestral home. When taking a bus to Rekong Peo on the treacherous and zigzagging road that branches off from National Highway 22, the Powari *Wazir's* property stands out on the opposite side of the valley. It is anchored by a magnificent large house in the traditional Kinnauri design painted with bright green and red colors, perched on a huge slab of Himalayan rock overlooking the Sutlej River, which meanders many hundreds of feet below. Thousands of feet of majestic mountainside, part of the Kinner Kailash Mountain Range, form the backdrop to the *Wazir's* property, giving one the spellbound feeling of having stepped into Shangri-La. The landscape is heavily terraced with apple orchards of varying ages, with the youngest ones encroaching into the high elevation *chilgoza* pine and deodar cedar forests that were once a dominant feature of this landscape. Above the coniferous tree line closer to the summit, patches of Himalayan birch trees can be detected by the discerning eye. During an interview on land ownership issues in Kinnaur, one of my key informants recalled the *Wazir* and his vast property as it had been sixty-five years earlier:

> He owned a huge chunk of land from the bank of the Satluj River[53] up to the top of the Kinner Kailash Mountain; the entire side of the mountain belonged to him. He was the minister of the *Raja* of the Bashahr Princely State so the land was gifted to him by the *Raja* himself (Key Informant Interview, September 2012).

During my field research, I repeatedly spoke with people who seemed to be in awe of the enormity of the *Wazir's* land "extending from the riverside up to the top of the mountain." This uniformly perceived belief about the great extent of the *Wazir* land also represents dynamics of power and control of people and resources. There is of course some sense of exaggeration in this description, as the area from the bank of the Sutlej River to the summit of the mountain is a vast Himalayan landscape given that the Kinner Kailash Range is a Himalayan giant peaking at 6,473 meters (21,237 feet) (Sanan & Swadi, 1998). Nevertheless, this description is ingrained in the memory of those who directly recall the days prior to Independence, and those reiterating the accounts they have heard many times from their parents and other elders. Based on the records I was able to access at the time, the exact size of the *Wazir's* land is uncertain, though there is a mention in the Shimla State Gazetteer that the *Wazir* held "a considerable amount of land both in *jagir* (estate) and as ordinary properties" (Shimla District Gazetteer, 1911, p. 25), and again the 1921 Report on Forest Settlement of the Sutlej Valley notes that, "The *Wazir* of Poari owns a large *Jagir* containing the Tangling and Poari forests in the Kailas Range"[54] (Glover, 1921, p. 7). Each village in Kinnaur has rights to the forest situated near and around the village, and as the *Wazir* also owned the forests of the villages of Powari and Tangling, it is not surprising that Kinnauris perceived the *Wazir's* land as colossal.

[52] Also spelled Poari
[53] The Sutlej River is pronounced Satluj by the Kinnauris
[54] Kinner Kailash Mountain Range

One of my key informants discussed the Powari *Wazir* as we sat on the fifth floor balcony of his hotel in Kalpa, as the last rays of the sun diffused its warm crimson light on the august Kinner Kailash range in front of us. It was September and the weather was already cooling. Buddhist chanting broadcast from speakers at the temple far below provided a serene soundtrack. Apple orchards dotted the landscape and where the elevation was too high to cultivate apples, we could see fields of green peas and kidney beans, other cash crops. As we sipped warm sweet tea, my respondent pointed to the opposite side of the valley where the village of Powari sat and continued discussing the *Wazir*:

> In the 1970s when this law was introduced, the Powari *Wazir* sold his land for very cheap to other people so that the government would not take his land. The *Wazir* sold a huge orchard for one *lakh*[55] Rupees only. The person who purchased that land sold the wood, the forest on the land, for three *lakhs* at that time. Now he has planted apples on that piece of land. Now he is getting about ten million Rupees [100 *lakhs*] from that orchard. More than 150 households bought the *Wazir's* land in the 1970s (Key Informant Interview, September 2012).

My key informant is referring to the 1972 Himachal Pradesh Ceiling on Land Holdings Act, which allowed a maximum holding of 70 acres to a tribal Kinnauri family and mandated the distribution of the surplus land to the landless. Before its implementation however, many of those belonging to the large landowning class, such as the *Wazir* of Powari, employed different means, including the manipulation of legal channels and bribes, to bypass the law. This claim was repeatedly expressed to me by participants. For example, interviewees mentioned that some of the large landowners split up their joint families so that each of the individual families would be able to hold onto the maximum allotted acres. Other tactics, I was told, included the division of lands and the transfer of land parcels to relatives. Still, many simply sold their excess land at below market value, to those who had the means to purchase it, before the land was seized by the government for redistribution, which is the story I heard repeatedly about the Powari *Wazir*. These approaches are what Borras (2007) refers to as "an "apparent-but-not-real" redistributive land reform" where little change within the existing agrarian structure takes place (Borras, 2007). These tactics were also exercised by large landowners in other areas of Himachal Pradesh (Bhatnagar, 1981).

Other interviewees, similar to the following retired revenue officer who worked specifically on land matters in Kinnaur, mentioned that some government officials who were close to the *Wazir* warned him prior to the implementation of the Act. The warning provided the *Wazir* ample time to take measures against the loss of his land and social position:

> When the land ceiling act was about to be implemented some officials warned the *Wazir* of Powari that they were going to implement this land reform and that he should do something. The *Wazir* then sold his land so that it would not be taken away from him by the government. This is why now there are people from other Kinnauri villages in Powari; these were the people who bought the *Wazir's* land (Interview, September 2012).

Two interrelated points struck me as interesting in this interview. First, the collusion of government officials with the *Wazir* was rooted in protecting the landlord's interest at the cost of

[55] One lakh equals to 100,000.

reform and social justice. There are different reasons why an official might have warned the *Wazir*. The official may have been compensated in cash and kind, but also by warning the *Wazir*, the official may have strengthened his own ties with a powerful wealthy person, which may produce advantageous in the future. The second point was the ability of the *Wazir* to retain his grip on his social position. It is true that many of the apple orchard owners of the village of Powari are originally from different villages in Kinnaur, with some now permanently residing in Powari, while others only tend their orchards there. This reflects the importance of land as people were either willing to leave their ancestral villages and family ties to reside in a different village, or travel long distances to attend to their orchards. Who were these people who were willing to purchase and work the land away from their ancestral homes? In the 1970s the few people in Kinnaur who had access to money belonged to the upper caste and upper class sector of society and were amongst those capable of purchasing the *Wazir's* land in Powari. The *Wazir* safeguarded his social position by selling to people who were socially close to his caste status and maintained a spatial class-caste buffer.

## Chapter Conclusion

The implementation of post-Independence agrarian reforms in Kinnaur has been complex. There were undeniable challenges to the execution of Kinnauri land reforms, especially those centered on land ceiling legislation. Deininger and Binswanger (1999) are among those who criticize ceilings on land ownership, arguing that in addition to ceiling laws incurring expenses for the state, landlords take measures to avoid laws, and such measures generate corruption and red tape (Deininger & Binswanger, 1999). This avoidance has been observed in the case of the Powari *Wazir* and in other examples through Kinnaur. Borras (2006) however, counters by maintaining that "The presence of evasive and subversive actions of landlords against a land reform policy is a good indicator of the degree of real redistributive reform character of the policy" (Borras, 2006, p. 115). And this, too, is borne out in the fact that the land of the Powari *Wazir* has now been distributed across at least 150 separate families. Writing on Salvadoran land reform, Diskin (1989) argues that it would be simplistic to believe that large powerful landlords would move out of the way and willingly gift part of their land and social position to their perceived inferiors. Landlord opposition to land redistribution is to be expected (Borras, 2006; Sethi, 2006). When discussing the general issue of land reforms in India and official corruption, Sethi (2006, p. 74) notes that "Vested interest of the landed elite and their powerful connection with political-bureaucratic system have blocked meaningful land reform and/or their earnest implementation." Deere (2006, p. x) too agrees that in cases where agrarian reforms have not produced good results, it has mainly been due to "lack of political will among elites in the face of entrenched resistance from the landlord class." These arguments all hold true for Kinnaur as displayed with the examples in this chapter. The fact that Kinnauri elites sought to thwart land reform is not evidence of policy failure per se, but is an important aspect of the complexity of land reform in practice.

The powerful landed class was engaged in a number of measures to secure itself against surrendering land for redistribution. This class was relatively sophisticated politically, and engaged in a range of irregularities and manipulations of the bureaucratic system. Perhaps as a consequence, in Himachal Pradesh as a whole there was an insufficient amount of land surplus (Sethi, 2009) for redistribution, and the state consequently had to arrange for further means— such as distribution of village commons— of providing land to its marginalized population (Mehta, 2006). Despite the resistance of landlords and corruption within the political-

bureaucratic system, over time land reforms in Kinnaur have been successful in providing the majority of landless Kinnauris with land, albeit in some cases modest and marginal in quality. Today, Kinnauris are using their land to produce cash crops such as apples from which they receive economic benefit.

Despite the shortcomings of the process under which land schemes were implemented, the significance of land reforms under schemes such as the Nautor Land Rules of 1968, and the 1972 Himachel Pradesh Ceiling of Land Holding should not be undervalued. Land allocation to the landless and marginal landholders has accomplished the goal of narrowing the socio-economic gap including caste and class disparities that once existed. This situation is possibly threatened by the increasingly frequent division of family land. With the decline in the joint family and fraternal polyandry systems, siblings are partitioning family landholdings into individual plots. In a generation or two those who started off with small but meaningful pieces of land may end up owning what amounts to small garden plots. For now, however, it would appear that most Kinnauris are faring well.

Today in Kinnaur the title of "landless" is used to refer to the marginal landholders, or those owning less than five *bighas* (0.40 hectare) of land. Although there are households who fall under this category, there are very few households in all of Kinnaur who are completely without ownership of land. In this regard, land schemes such as *nautor* fulfilled their goal of narrowing initial socio-economic disparities and providing land to the landless. Land reforms have also contributed to the rise of the Kinnauri apple economy, which is largely based on small-scale growers. As the next two chapters will illustrate, land reform is part of many changes that are being witnessed in Kinnaur today. Land reforms have played a role in the broader social dynamics that are contributing to Kinnaur's current "golden era" of its apple economy. One interviewee encapsulated these changes by saying that, "Today, crop is good, market is good, and so five *bighas* is reasonably good. If you have five *bighas,* you will earn sufficient money and you will have a good livelihood" (Interview, September 2012).

# Chapter Three: Political Ecology of Climate Change: Shifting Orchards and a Temporary Landscape of Opportunity

## Chapter Introduction

### *Prelude*

It was a chilly mid April morning and the sun was out shining on the majestic Kinner Kailash Mountain Range, an august empire of beauty, sacred to both Buddhist and Hindu Kinnauris, with peaks surpassing six thousand meters, which loomed over the village of Kalpa. We had already walked three kilometers on the ancient Hindustan-Tibet Road from the villages of Kalpa to Roghi and were taking a rest before trekking further up the mountain and observing the newly planted high elevation apple orchards. The narrow and sinuous road had breathtaking views, as it climbed by an area called Suicide Point about two thousand magnificent feet above the Satluj River. On this side of the road towered precipitous giant Himalayan cliffs, beyond which were windswept native forests of deodar cedar (*Cedrus deodara*) and *chilgoza* pine (*Pinus gerardiana*). In the upper reaches wild waterfalls penetrate canyons through which the local shepherds and their animals still walk to reach high-country pastures. Small streams, which seasonally transform into torrential creeks, flowed down the cliffs and crossed the road. Walking on this road becomes especially threatening during and after the rain, as loose rocks of various sizes tumble down the mountainside, crashing on the road. The mountain felt alive as the wind howled wildly, giving life to the locally held belief in the Ghost of Roghi haunting the area.

Small villages sprinkled the landscape, encased in ever-expanding apple orchards of varying sizes and ages, where not long ago forests of cedar and pine stood. The orchards are the main source of livelihood for Kinnaur and have been gradually migrating up the mountain in search of more land, water, and suitable climate to grow apples. Most astonishing are the new orchards that have been developed perching on sheer cliffs. Some are irrigated with slender black plastic pipes stretched through the forest and over the road linking the trees to water sources tens of kilometers away, the orchards' only source of water. One wonders with some awe at the difficulties of developing and tending these orchards on the high and steep mountainsides, from their planting and irrigation, through their fertilization and care, to their eventual harvest and transportation of heavy boxes to the road. The view is a testament to the challenges humans overcome for survival, livelihood, and economic success.

### *Introduction*

With changes in the climate and local weather patterns, the apple belt of the state of Himachal Pradesh has been migrating to higher elevation areas. My research finds that upland areas in the remote Kinnaur District are now becoming a desirable region for apple plantations. As discussed in the previous chapter, the formerly isolated and predominantly landless Kinnauri Tribal peoples now possess land, albeit small parcels. They have benefited from the geopolitical circumstances of their district, state land reform policies, their own decades of hard work, and the current consequences of climate change, particularly the increasingly warm temperatures that are transforming high elevation lands into suitable areas for growing apples and other cash crops such as peas. With rising temperatures rendering many old apple orchards unfit for apple

production, along with development in core areas, the land that was once least favored and least accessible is gradually becoming the most desired land for apple orchards.

Data suggests that there is a widespread recognition amongst Kinnauri orchard owners and the government agencies that serve them that climate change has affected the optimal conditions for growing apples so that remote, higher elevation areas that were once considered marginal lands are becoming conducive to growing this cash crop. Climate change has been an important influence in the development of the apple economy in Kinnaur, especially in the last two decades, as warming temperatures have expanded the area suitable for growing apples. In this chapter, I examine the role of the changing climate as one contributing factor in the transformation of Kinnaur into a successful apple-producing region, a transformation that has had many social impacts, as discussed in the following chapter.

I call the present moment "The Golden Era of Kinnaur". In the last seven decades, and especially in the last 20 to 25 years, Kinnaur has been experiencing colossal changes economically, politically, socially, culturally, and environmentally. Warming temperatures have created a resource— new land for apple plantations—that Kinnauris have tapped into, enabling economic prosperity and progress. In this chapter, I show how climate change is shifting the physical and environmental characteristics of the land, and changing patterns of agricultural production and land use. Climate related data from the state of Himachal Pradesh supports the claims of orchard owners regarding these shift. Although shifting livelihoods have been documented in other areas around the world, my research adds a new and under-emphasized dimension: how climate change may provide a temporary landscape of opportunity for once-marginalized people.

Though the main focus of this work is on the District of Kinnaur and its transition, I use the Kullu District, also situated in the state of Himachal Pradesh, as a lens through which to better demonstrate and understand change and continuity in Kinnaur. Today the district of Kinnaur is following a similar trajectory as the Kullu District of the 1980s in terms of its economic transition and its dependence on the production of apples. I will examine this transition in terms of the potential effects of the changing climate and its temporary unexpected consequences in relation to the upward migration of the apple zone and its significance for Kinnaur. Although this chapter is not a comparative analysis of the two districts, it will use the Kullu District and the course of its apple economy to better examine the larger phenomena occurring in Kinnaur today.

## Analytical Approaches to Climate Change in Mountain Regions

This section examines climate change and adaptation literature to aid in understanding how climate change in Kinnaur is altering modes of production and engendering new relationships with the landscape. Much of the literature on the impact of climate change examines populations at immediate risk, giving little attention to those who might benefit from climate change, even if only in the short term (O'Brien & Leichenko, 2003). The current Kinnauri encounter with climate change is in contrast to the general experience of the poor and marginalized described in the climate change literature. The case of Kinnaur shows that marginalized people may not always immediately suffer from the effects of climate change. There are circumstances under which climate change may create a temporary landscape of opportunity.

In mountain areas, as glaciers recede and the snowline moves upward, an upward movement of plant and animal species takes place (Cannone, Sgorbati, & Guglielmin, 2007; Kelly & Goulden, 2008; Parmesan & Yohe, 2003; Walther, 2003). This shift is also occurring in Kinnaur. As the Kinnauri climate warms, the fortunes of its people are also changing – once marginal uplands can now support apples and other cash crops such as peas, at the same time as formerly prime orchard lands at lower elevations sees declining productivity. The Scheduled Tribe population of Kinnaur is in a position of ascending both spatially to higher elevations, and materially as they improve their socioeconomic status and exploit the unforeseen consequences of climate change.

## *Climate Change and Mountain Systems*

The last century has witnessed an overall global rise in surface air temperature by approximately 0.5 to 1.1 degrees Celsius (Metz & IPCC, 2001; Parry & IPCC, 2007). Tompkins and Adger (2004) discuss four possible outcomes under climate change: slow change in the average climate conditions, amplified and greater variability, higher frequency of extreme climatic events, and rapid changes in the climate that will induce calamitous shifts in various ecosystems. These outcomes are likely to result in opportunities to some societies while enhancing the vulnerability of others, especially those already on the brink of survival (Tompkins & Adger, 2004).

Regional variations have been detected in surface air temperature change. Among these changes it has been observed that in the winter, surface warming of the land has been greater than that of the sea, and this is especially the case in northern latitudes with higher elevations (IPCC, 1996). Beniston et al. (1997) make a connection between elevation and surface temperature change and conclude that in higher elevation areas there has been a linear relationship, or altitudinal dependency, between altitude and minimum temperature changes, implying more warming in higher areas than in lower elevation areas (Beniston, Diaz, & Bradley, 1997; Beniston & Rebetez, 1996). Some estimates show that warming at higher altitudes is occurring three times faster than the global average (IPCC, 2007; Nogués-Bravo, Araújo, Errea, & Martínez-Rica, 2007; Trenberth et al., 2007).

As one of the most complex and active systems in the world (Eriksson et al., 2009), the Himalaya is exceptionally susceptible to global warming (Bandyopadhyay & Gyawali, 1994). According to IPCC 2007, by the end of the 21$^{st}$ century, the average temperature in the Western Himalaya is predicted to rise between 2-4.5 degree Celsius (IPCC, 2007). The rate at which the Northwestern Himalayan region, including the state of Himachal Pradesh has warmed in the last 100 years (1.6 degree Celsius) has been much higher than the rise in the global air temperatures (0.5 degree Celsius- 1.1 degree Celsius) (Bhutiyani, Kale, & Pawar, 2007). As a whole, the Himalaya is highly sensitive to climate change.

Globally, mountain communities are becoming increasingly exposed to and altered by climate change's severe impacts on high elevation regions (Beniston, 2003). Climate change can be expected to result in a host of experiences including drought, landslides, cloudburst, and floods (Barnett, Adam, & Lettenmaier, 2005; Chaudhary & Bawa, 2011). Rapidly shrinking glaciers are not only affecting people in high elevation areas, but also profoundly affecting the downstream water resources for millions of people in the lowlands who are highly dependent on mountain water for domestic, agricultural, and industrial use (Barnett et al., 2005; Graham, Hagemann, Jaun, & Beniston, 2007).

Consequences of the rapid recession of glaciers are increasingly visible in the Himalayan region (Beniston, 2003). Continuous glacier retreat can have devastating effects, causing destabilization in mountain slopes and leading to calamitous landslides and potential creation of lakes on river and stream beds, generating catastrophic floods (Ballantyne & Benn, 1994; Dadson & Church, 2005). An analysis of the long-term trends in temperature and precipitation for the region of Northwestern Himalaya over the twentieth century has revealed "overall increasing trends in temperatures" pointing to a considerable rise in temperatures with an annual warming rate of about 1.6 degrees Celsius (Bhutiyani et al., 2007, p. 163), though winters have been warming at a faster rate of 1.7 degrees Celsius (Bhutiyani et al., 2007; Verma, Mankotia, Verma, & Sharma, 2013). Bhutiyani et al. (2008) studied the discharge of the Sutlej River in Kinnaur from 1991- 2004 and revealed a decrease in discharge of the river which "may be on account of rapid recession of the glaciers and their waning contribution" (Bhutiyani, Kale Vishwas, & Pawar, 2008, p. 625).

## *Warming and Upward Movement of Species*

Changes in the global climate have affected a host of organisms altering distribution of species and ecosystem structure and dynamics (Walther et al., 2002). In many of the mid- and high-latitude areas, freeze-free periods are extending and therefore affecting the phenology[56] of species (Parmesan, 2006; Walther et al., 2002). Phenological changes include earlier emergence of insects and pollinators, or earlier development of buds and blossom of fruit trees. According to Walther et al. (2002), in general there is evidence that since the 1960s, activities of the springtime have been occurring increasingly earlier.

Long-term climatic changes are anticipated to affect vegetation in high altitudes, as these areas are highly sensitive to change (Gottfried, Pauli, & Grabherr, 1998). There is ample evidence of the movement of species distribution to higher altitudes due to changes in the climate (Chen, Hill, Ohlemüller, Roy, & Thomas, 2011; Parmesan, 2006; Parmesan & Yohe, 2003; Thomas, 2010). In the last 50 years "altitudinal-range margins of plant species and bioclimatic zones" have been migrating to higher altitudes (Cannone et al., 2007, p. 360). For example, a study in the Southern Swedish Scandes revealed that species of trees and woody shrubs have advanced upward by about 120-375 meters (Kullman, 2002). Additionally, the decadal rate of movement for alpine and nival (permanent snow-bound areas) plant species in the European Alps has been about eight to ten meters (Cannone et al., 2007; Grabherr, Gottfried, & Pauli, 1994; Walther, Beißner, & Burga, 2005). A study of the Himalayan Blue Pine *(Pinus wallichiana)* in Western Himalaya recorded that in a period of 10 years, there was an upward migration of about 19 meters on the south slopes and 10 meters on the north slopes of the high mountains, linking the species upward movement to climatic changes (Dubey, Yadav, Singh, & Chaturvedi, 2003). In Kinnaur, and the Western Himalaya in general, in addition to noticeable phenological changes and the upward movement of species, people and modes of production are also migrating upward seeking more suitable areas for cash crop plantations and adapting to the changing climate for the time being.

## *Apple Cultivation and Climate Models*

One crucial impact of climate change in Kinnaur has been on apple cultivation. Nine of the 12 districts in the Western Himalayan state of Himachal Pradesh are apple-growing districts,

[56] Phenology describes the cyclical seasonal changes of plant and animal species in relation to the climate.

including Kinnaur and Kullu. Since 1981-1982, there has been an increase in the area under apple cultivation in eight of nine districts (the lower elevation district of Solan situated in the transitional sub-temperate-temperate zone is the exception (Verma et al., 2013). The districts of Kinnaur and Lahaul-Spiti, situated in the high altitude dry temperate zone, gained 6,449 and 636 hectares respectively, while Kullu District gained 11,560 hectares (Verma et al., 2013). According to Verma et al. (2013, p. 91), "The loss or gain in land area by districts under apple has been the direct implications [sic] of increasing air temperatures in mountain regions as a result of global climate change."

Verma et al. conducted research using HADRM3 model[57] under scenario A1B[58] to predict climatic conditions in Himachal Pradesh between 2021 and 2050. As their baseline period, they compared 1960-1990 data to climatic conditions that are likely to occur between 2021-2050 (Verma et al., 2013). Changes in the Himachal Pradesh districts were investigated in terms of maximum and minimum temperatures and rainfall. The results showed that under this scenario, districts of Kullu and Kinnaur will experience an "increase in both maximum (2.00–2.50 °C) and minimum (2.54–2.99 °C) winter temperatures" (Verma et al., 2013, p. 96). These predicted temperature changes can influence apple production by decreasing the chill accumulation unit in addition to reducing the moisture in the soil which can lead to water stress conditions (Verma et al., 2013). They write, "Climate conditions in Kinnaur reveal that fruit production in low and mid altitudes may suffer adversely, but at higher altitudes, production is very likely to increase" (Verma et al., 2013, p. 97).

## *Climate Change and Mountain Communities*

Today, climate fluctuations are becoming more erratic and unpredictable and extreme weather phenomena are becoming more common in the Himalaya (Chaudhary & Bawa, 2011). Some of these climatic changes are manifesting in changes in agricultural and horticultural practices, availability of water resources, and changing biodiversity of the mountain system, which in turn affects the livelihoods of mountain peoples.

When examining land-based livelihoods such as agriculture or horticulture in mountain regions, it is imperative to consider physical and cultural characteristics of these areas. Verticality has been an important attribute to mountain areas and it includes both slope and altitude. Steep mountain slopes cannot undergo the same degree of farming, deforestation, and animal grazing as non-mountainous areas (Eckholm, 1975; Jodha, 1996). This fragility makes mountain regions and their peoples especially vulnerable to environmental or economic shocks. Thus changes in climatic conditions will be expected to cause changes in social and economic behavior of the residents of mountainous regions like Kinnaur.

## *Adaptation*

Here, we look more at the idea of adaptation, not only with respect to the historical adaptation of mountain peoples to their environment, but also to adaptation in contexts of more rapid change. Adaptation is the process of people changing their lives in order to benefit from new prospects or respond to stresses and pressures (Nelson, Adger, & Brown, 2007). Nelson et

[57] This model was created by the Hadley Centre for Climate Prediction and is a Regional Climate Model (RCM).
[58] Special Report on Emissions Scenarios (SRES) of The Intergovernmental Panel on Climate Change includes several families of emission scenarios. A1B represents an economically expanding world balanced in its use of fossil fuels and other sources of energy (IPCC, 2001).

al. (2007) further define adaptation as a process of decision-making and an array of actions carried out in order to preserve the capacity to face either current or future-predicted change or disturbance in social-ecological systems. The adaptive capacity of a system is its ability or potential to effectively react to change and variability through behavioral, resource and technological modifications and adjustments (Adger et al., 2007). Mountain people, such as the Kinnauris, have devised various traditional adaptive strategies in order to harness the opportunities of their harsh biophysical conditions, and adapt to their constraints. However, traditional adaptation strategies may no longer be sufficient in the face of climate change, market penetration and social change (Jodha, 1997).

Adaptation can be considered successful if a community adapts "without undergoing significant changes in function, structural identity, or feedbacks of that system while maintaining the option to develop" (Nelson et al., 2007, p. 397). Successful adaptation requires awareness about the occurring change (both immediate and long-term), access to knowledge, effective governance, and the ability to change behaviors, practices, and livelihoods (Mirza Monirul, 2007). Additionally, boosting resilience and decreasing the degree of vulnerability are ways of adapting more effectively. To tackle climatic changes, risks and vulnerabilities must decline, while adaptive capacity must "enhance the resilience of people and places, localities, and ways of life" (Nelson et al., 2007, p. 396).

Adaptation to climate change varies depending on social difference (Adger et al., 2007). In general, most societies have an ability to cope with some variation of the changing climate, "yet adaptive capacities are unevenly distributed, both across countries and within societies" (Adger et al., 2007, p. 720). The adaptive capacity of a society depends for example, on access to and availability of technologies, reliable infrastructure or a health care system, adequate social security systems, and political representation (Mearns & Norton, 2010a; Ribot, 2010). Vulnerable people have fewer opportunities to adapt and will therefore be more affected by climatic shocks and stresses (Mearns & Norton, 2010a). Adaptive strategies can enhance social resilience (Bradley & Grainger, 2004). By using better coping mechanisms to adapt to existing climatic variations, resilience to face future change is strengthened (Adger et al., 2007; Tanner & Mitchell, 2008).

## *Marginality and Vulnerability*

Much of the social science literature on climate change is centered on a generalized recognition that poor, natural resource-dependent populations of the developing world, especially those in rural areas, like the Kinnauris, disproportionately bear the negative consequences of climate change (Kates, 2000; Mearns & Norton, 2010a; Mendelsohn, Basist, Kurukulasuriya, & Dinar, 2007; Raleigh & Jordan, 2010; Tanner & Mitchell, 2008). This is due, in many cases, to their direct dependence on climate-sensitive livelihoods such as agriculture, forestry, and fisheries. For a marginalized community with limited resources, the loss of that resource can be devastating. Climate change however, can produce both opportunities as well as vulnerabilities to different societies at different point in time, and depending on the types of change experienced (Tompkins & Adger, 2004).

Until recently, the human and social dimensions of climate change have been ignored (Global Humanitarian Forum, 2009; Mearns & Norton, 2010a). This previous lack of attention to the social dimensions of climate change is exactly one reason that makes this research important. The impacts and vulnerabilities associated with climate change are intertwined with broader social, economic, and political processes that generate poverty and marginalization

(Eriksen & O'Brien, 2007; Kelly & Adger, 2000; Leichenko & Silva, 2014; O'Brien & Leichenko, 2003; Rayner & Malone, 2001; Schipper E., 2007). A common argument is that climate change enhances existing vulnerabilities and that those already poor and marginalized, or those on the brink of poverty, will inevitably be most affected by climatic shifts, and will have little capacity for protection against climate-inflicted calamities. When investigating issues of marginality and vulnerability to climate change, it is important to move beyond the question of *how* vulnerable people are affected, and also inquire about *why* they bear the consequences of the changing climate (Mearns & Norton, 2010a). Geographic location, sources of livelihood, amount of assets held, social dynamics and power relations within communities all contribute to vulnerability and marginality (Mearns & Norton, 2010a). Identifying these factors can allow for more suitable adaptation strategies.

Blaikie and Brookfield (1987) define marginality as a three-fold process, with three factors—ecological marginality, political marginality and economic marginality— interacting with one another. This three-fold process can be further defined as "exclusion from resources, decision-making and rights" (Brun & Blaikie, 2013, p. 2). Ecological or environmental margins are zones in the landscape where specific ecosystems can survive, but beyond which there is a limit to their reproduction. These are areas that are vulnerable to change or disturbances and recuperate from shock slowly. Ecological marginality occurs when poor, socio-economically marginal people are confined to using less productive and more fragile or marginal lands (Ribot, 1995). Marginality in the context of economics signifies production limits, inadequate market access, high production costs with low returns, and social disempowerment. Political marginality refers to communities with little access to political process, little decision-making voice, and difficulty in gaining economic opportunities. Li (1999, p. xvii), writes that "Marginality must … be understood in terms of relationships, rather than simple facts of geography or ecology" . The marginalized or weaker sector of society is of low priority to those in power (Ribot, 2010). For example, mountain people living in remote and difficult-to-access mountain regions far from centers of power may have less representation within the political system (Jodha, 2005a; Jodha, Bhadra, Khanal, & Richter, 2002). Power dynamics and social relations play an important role in the understanding of marginality and marginal populations.

The three marginalities defined by Blaikie and Brookfield reinforce one another in that "degradation is both a cause and a result of social marginalization" (Blaikie & Brookfield, 1987, p. 23). In other words, socially and politically deprived and disempowered people have little choice but to use sensitive ecological zones to sustain themselves. By doing so, they foster the deterioration of the resource base on which they survive, and therefore further diminish the productive capacity of that system, thereby becoming further entrenched in their marginality and more vulnerable to climatic change (Ribot, Najam, & Watson, 1996).

Marginalization and continued processes of inequality and social differentiation lead to vulnerability (Ribot et al., 1996). Vulnerability describes the relative risk of environmental change as experienced by individuals, households, and communities (Raleigh & Jordan, 2010). Vulnerability is susceptibility to harm, in other words, the inability to sustain or endure pressures and stresses caused by change (Jodha, 2005a). It is a condition whereby people lack protection from harmful causes and it may be linked to the lack of livelihood options. People experience vulnerability in different ways depending on the physical location where they reside, their possession of assets, and socioeconomic status such as age, gender, caste, and their access to government support. Ribot (2010) writes that severity of climate change outcome or climate events is associated with the existing conditions and social structures. Vulnerable groups, such

as women, children, elderly and indigenous communities who have little access and ownership rights to resources can be expected to experience a different outcome from the same climate event than, for example, the wealthy, men, and those living in the Global North (Mearns & Norton, 2010a; Ribot, 2010). Due to mountain fragility, mountain people and their livelihoods are vulnerable, and therefore their situation is increasingly uncertain in the face of climate change (Jodha, 1990, 1997). At the same time however, while some communities are becoming more vulnerable and marginalized as the result of climate change, there are others, like the Kinnauri, whose specific circumstances provide opportunities for beneficial adjustment and adaptation, even if those changes are not sustainable in the long run, especially not if climate change continues. As mentioned, for a system or society to adapt to the changing climate, adjustments must be made to diminish the impact of change. This means either exploiting new prospects, or facing the consequences of change.

## Context: Himachal Pradesh

The increase in average temperature observed in Western Himalaya (Bhutiyani et al., 2007), has had visible effects on the agricultural production of the state of Himachal Pradesh, and specifically on the state's apple production (Negi et al., 2012; Vedwan & Rhoades, 2001). In this section we look at the context of Himachal Pradesh, with a particular focus on Kinnaur's neighboring region of Kullu, wherein climatic changes have effect crop production.

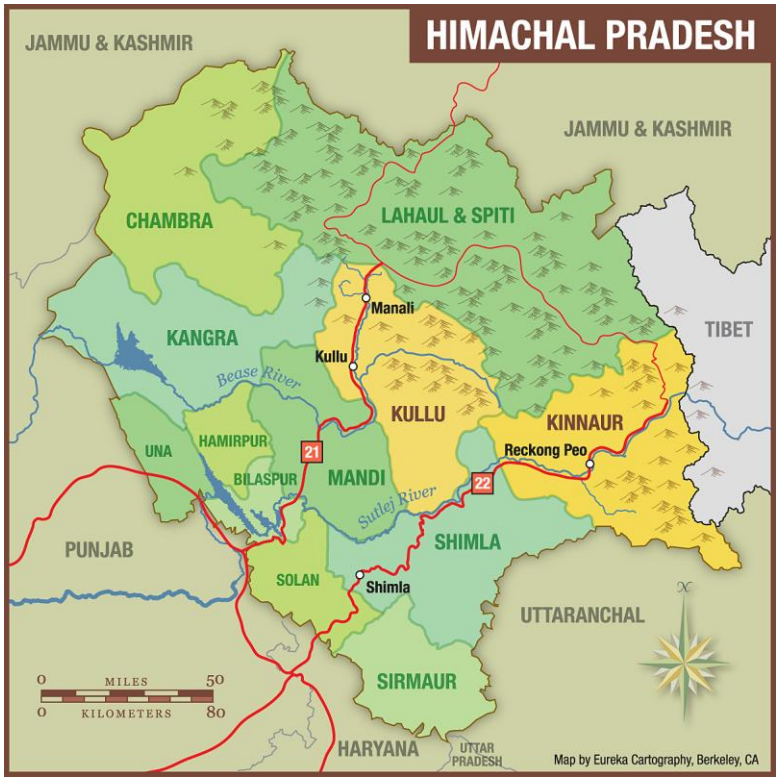


**Figure 4: Map of Himachal Pradesh**

### *Agro-ecological Zones of Himachal Pradesh*

Himachal Pradesh includes territory whose altitude ranges between 350 - 7000 meters above sea level (Government of India Planning Commission, 2005). The wide altitudinal range of the region contributes to climatic variations, including temperature, topography, rainfall, humidity, and diversity of crops. The state is divided into four agro-climatic zones: zone I, the sub-tropical zone of the low hills near the plains (350-650 meters in elevation); zone II, the sub-humid zone of the middle hills and valleys (650-1800 meters in elevation); zone III, the temperate wet zone of the high mountains and valleys (1800-2200 meters in elevation); and zone IV, the temperate Trans-Himalayan cold and dry zone (2200 meters and above in elevation) (Bhati, Singh, Rathore, & Sharma, 1992; Verma & Partap, 1992).

Cultivable land in the temperate Trans-Himalayan zone IV is sparse, amounting to only about three percent of the total cultivable area of the state of Himachal Pradesh, and the soil is highly susceptible to erosion as avalanches and glaciers are common features of the landscape (Verma & Partap, 1992). Precipitation of the temperate Trans-Himalayan cold and dry zone (IV) amounted to 200 mm in the summer time, though the area received heavy precipitation in the form of winter snow (Verma & Partap, 1992). For the purpose of this chapter, I will mainly discuss the latter two zones as most of Kullu, along with small parts of Kinnaur, are situated in zone III and most of Kinnaur is situated in zone IV (Singh & Kumar, 2014).

### *Himachal Pradesh and the State's Apple Production Trajectory*

Many of the changes faced by Kinnaur today have transpired in the district's modern era, beginning seven decades ago in the period between the 1950s and 1970s. The coalescing of various political, economic, and social events as described below initiated the transformation of Kinnaur from a pre-capitalist economic system based solely on subsistence agro-pastoralism and trade devoid of a cash base, and propelled it towards a market economy dependent on horticulture, apple cultivation to be specific. The state's vision of development at the time engendered a fundamental conversion of the "hilly" areas of Himachal Pradesh including the districts of Kullu and Kinnaur.

The interest in horticulture began in the late 1950s and early 1960s when a newly independent India was in the process of state building and economic development. The country's Western Himalayan region was targeted as being suitable for economic expansion through horticulture development. The state of Himachal Pradesh, therefore, began to focus on developing its horticulture economy as a means of improving the livelihood of the area's majority rural and mountainous population. The districts of Kinnaur and Kullu, amongst other rural mountain areas, were seen as well-suited for growing temperate fruits such as apples, cherries, apricots, pears, almonds and walnuts as an economic strategy.

By 1988-1989, apples had become the dominant fruit consisting of about 80 percent of total fruit production in Himachal Pradesh (Verma & Partap, 1992). Apple production in the state increased from 12,000 metric tons in 1960-1961 to one of its highest yields of 394,000 tons in 1989-1990, after which the state's apple yield of tons per hectare gradually declined (Jindal, Chauhan, & Mankotia, 2004). Today, apples constitute about 90 percent of all fruit produced in Himachal Pradesh[59] (Partap et al., 2012). Even though the overall apple production has increased as the result of more areas being placed under apple orchards (Awasthi, 2004), the productivity of many of the earliest-planted orchards, especially those in lower elevations, has declined (Rana, Bhagat, Kalia, & Lal, 2009). The yield of apple trees is dependent on various dynamics including "climate, soil, cultivars, rootstock, spacing and cultural management practices" (Awasthi, 2004, p. 61). Of these inputs, climatic changes are unpredictable.

## Historical Factors Leading to Kinnaur's Economic Transition

In order to situate the region, this section provides a brief background on Kinnaur of pre- and post-Independence India and examines historical occurrences that have propelled the district to emerge into its current position.

[59] The dominant apple variety in Himachal Pradesh, about 83 percent, belongs to the Delicious group of varieties (Awasthi, 2004), which is also the case in both Kullu and Kinnaur.

Kinnaur's transition in its modern history began with India's Independence in 1947 and the merging of various ensuing events. Interest in horticulture began on a small scale with politically connected individuals who observed the economic advantages of apple growing elsewhere in Himachal Pradesh. The 1962 Indo-China war that was fought along the border of India and Tibet, part of which is shared by Kinnaur, led to the construction of a national highway through the district and enabled the Kinnauri population greater access to once-distant markets. Simultaneously, the implementation of land reforms60 gradually provided small plots of land to the ordinary Kinnauris, enabling the slow adoption of apple production and a gradual transition of a system based on trade and subsistence agro-pastoralism to horticultural cash crop.

The concept of cash is new in Kinnaur as "monetized markets were altogether non-existent. With the passage of time some periodic fairs dedicated primarily to trade and commercial activities led to the introduction of a money economy in a most limited sense" (Bajpai, 1991, p. 76). Interviewees revealed that it has been as recent as the 1970s and 1980s, as the commercialization of apple cultivation began to spread, that cash started to percolate into Kinnaur and become more available to the average Kinnauris. By the 1990's, growing apples had become a significant source of livelihood in Kinnaur, as it remains so today.

In 2011-2012 total horticulture area under fruit production was 12,868 hectares, of which 10,102 hectares were under apple production (Government of HP Department of Economics & Statistics Kinnaur, 2013). This was a big jump from 1961 and then again in 1991, when only 300 and 4,431 hectares respectively were under apple production (Government of Himachal Pradesh, 1991). According to field data, almost every household, regardless of caste and socio-economic background, has a small piece of land and, at the very least, a handful of apple trees from which it benefits. Of the 127 individual Kinnauris interviewed for this research, all (100 percent) owned land and profited from orchards of commercial apples. Field observations and interviews revealed that subsistence practices are declining as most cultivable land has been converted to apple orchards. Significant shifts in land and natural resources, social organization, and culture have been and are rapidly taking place.

We will now examine the Kullu District as its history presents some interesting parallels to the present-day situation in Kinnaur. The examination of Kullu's recent course including its economic ascendance into a successful apple-cultivating region and implications of climate change on this activity will shed further light on current occurrences in Kinnaur.

## Kullu District

This section examines several fundamental parallels between the two districts of Kullu and Kinnaur to guide our understanding of climate change occurrences in Kinnaur. I begin by briefly discussing the pre-Independence history for a comparative background analysis, setting the stage for looking at the similarities between the two districts. I will then consider post-Independence Kullu District and the rise and decline of its apple production. Finally, using available secondary data, I will consider changes in the weather patterns in Kullu and their implication for the apple economy of the district and its second transition from apples to other cash crops.

Kullu District in the central part of the state of Himachal Pradesh lies to the west of Kinnaur. The Pir Panjal Range, forming part of the Lesser Himalayan Region, traverses the district. The district has an altitudinal range of between 350-6500 meters (Vedwan, 2006),

[60] Please refer to Chapter 2 for a discussion on land reform issues.

though human habitation does not go beyond 3500 meters (Aditya, Rana, Chauhan, & Sen, 2013). Similar to Kinnaur, there are various agro-climatic zones that change with elevation, as does the temperature, which decreases with elevation gains. The district is characterized by cold dry weather with maximum temperature of 15.8 degree Celsius in January to 32.8 °C in June, and the minimum temperatures of 21.1 °C in July to as low as 0.7 °C (Aditya et al., 2013). Kullu Valley is the largest valley and an important apple belt in the District of Kullu.

## *Kullu District of Pre-Independence India*

Pre-Independence Kullu has some historical similarities to Kinnaur. Prior to India's Independence, Kullu was ruled by various *Rajas*[61], who, after 1846, ruled under British control. Similar to Kinnaur, prior to the introduction of apples, the people of Kullu had a subsistence-based livelihood. They grew irrigated rice in the valleys and a variety of traditional crops including buckwheat, wheat, and barley in the upper reaches, and fruit trees such as apricot, peach and walnut were plentiful (Tucker, 1997; Vedwan & Rhoades, 2001). In addition to the cultivation of local traditional crops on which people subsisted, Kullu was also a large producer of opium and cannabis, despite British attempts at prohibition (Chandel et al., 2013). People also depended on rearing animals, mainly sheep and goats, although a small number of cattle were also owned (Singh, 2009). Animals were used for a variety of purposes including transhumance pastoralism and trade (Saberwal, 1999). Kullu was a central area for trade and had regional markets and networks of trade routes linking the Punjab plains with the northern high elevation areas (Rizvi, 1999). Unlike the Kinnauris who participated in cross-border trade with their Tibetan neighbors, however, the people of Kullu themselves seldom engaged in trade in order to accrue wealth (Tucker, 1997). The traders of the area were either the Lahaulis, belonging to the area known today as the District of Lahaul-Spiti in northeastern state of Himachal Pradesh, or Punjabis who purchased crops such as opium for far away markets in the south (Tucker, 1997).

## *Post-Independence and Transitioning Kullu District*

The economic development of Kullu District since Independence has been focused on three different sectors including agriculture/horticulture, tourism, and more recently, hydroelectric projects (Chandel et al., 2013). Both horticulture and tourism were first adopted in the Kullu Valley, after which they gradually spread to the rest of the Kullu District. As in Kinnaur, after India's Independence in 1947, Kullu was also encouraged to transition from its subsistence economy to one that was centered on horticulture. Similar to Kinnaur, in Kullu significant infrastructural development began with the construction of a National Highway after the Indo-China War of 1962 (Gardner, 2002; Tucker, 1982). The National Highway, in addition to a series of link roads, joined formerly isolated areas in Kullu to its center (Gardner, Sinclair, Berkes, & Singh, 2002), and connected the district to the Indian plains, accelerating the adoption of commercial horticulture and opening up the area to tourism (Gardner, Sinclair, Berkes, & Singh, 2002.

The shift from trade and subsistence agriculture to commercial horticulture that began with Himachal Pradesh's path to statehood facilitated a transition in agrarian relations and livelihood patterns resulting in land use and land cover change. While Kinnaur's economic transformation only began to take hold in the late 1980s—in 1988 about 70 percent of cultivable land in Kinnaur was still under traditional crops such as varieties of buckwheat, an important

[61] *Raja* is a ruler or a king

dietary staple of the local people (Sharma & Minhas, 1993) —Kullu's transformation began in the late 1950s and early 1960s, "with the bulk of the planting having been undertaken in the 1970s and 1980s" (Vedwan, 2001, p. 50; 2006). To the extent these parallels hold, we can thus learn about Kinnaur's potential future by examining Kullu's past.

There are various reasons for Kullu's earlier development than Kinnaur. First, perhaps due to Kinnaur's Scheduled Tribe status, the area received less attention than Kullu did at the time. In general, the Indian Scheduled Tribes populations have been one of the most politically and economically marginalized groups in the country (Kapur Mehta & Shah, 2003).

Second, the Kullu District is less geographically remote, which directly supported the growing apple industry through relatively low costs to bring fruit to market, as well as receiving indirect support from Kullu's growing tourist industry. Due to Kullu's geographic accessibility, the district attracted tourism much earlier than Kinnaur. Although tourism began in the 1960s and 70s, it further developed and expanded in the 1980s and 1990s, and the district has since become a popular tourist destination attracting both domestic Indian tourists as well as non-Indians (Gardner et al., 2002). For example, the village of Manali, a small traditional settlement with a population of a few hundred inhabitants and two guesthouses in 1975, has transformed into a busy tourist destination in the Kullu District with 725 hotels and registered guest houses, as of 2000, and this number does not include the many unregistered operating guest houses (Gardner, 2002; Singh, 1998). The political problems in the District of Jammu and Kashmir also diverted many potential tourists from that area to the Kullu District (Gardner et al., 2002), bringing further income to its inhabitants.

Tourism has not benefited all people equally. Smaller landowners had little opportunity to take advantage of the changes (Vedwan & Rhoades, 2001). During the initial stages of tourism development in Kullu, the larger land owning class with better access to cash were able to diversify their sources of livelihood by providing hotels, guest houses, restaurants, and transportation such as local and long-distance taxi services, thus taking advantage of the new tourism (Vedwan & Rhoades, 2001). And while the Kullu District as a whole is becoming more attractive to outsiders, still today more remote towns and villages have little opportunity to take advantage of this industry.

Apple production became the dominant source of income in the district, driving Kullu to prosper by the late 1980s (Verma & Partap, 1992). However, production began to decline in the 1990s (Partap & Partap, 2009; Ray, Doshi, Alag, & Sreedhar, 2011; Singh, 2003b; Verma & Partap, 1992). For example, according to the Himachal Pradesh Apple Growers Association data, (cited in Vedwan and Rhoades, 2001), in the Kullu Valley, an important apple belt of the district, the peak production occurred in 1988-1989. The 1989-1990 harvest experienced "a 50% reduction from the previous all-time high year. Production, while experiencing some seasonal fluctuations, has not recuperated fully and an overall decline continues" (Vedwan & Rhoades, 2001, p. 110). By 1995, the Kullu Valley was producing only a quarter of its peak year (Vedwan & Rhoades, 2001). In the Kullu District as a whole, a fluctuating pattern of productivity has been observed with an overall decline of 0.4 tons per hectare from 1985-2009 (Aditya et al., 2013). According to Ray et al. (2011) and others (Partap & Partap, 2009; Singh, 2003b), one reason contributing to the decline in apple production is climate change and shifting weather patterns. Another reason for the decline may be attributed to the decrease in the number of pollinator trees planted by local orchard owners. In Kullu, as in Kinnaur, to maximize production, people replace their pollinator trees, which have little commercial value, with

commercial trees[62]. The decline in apple production is leading to another transition for the Kullu District, this time away from apple horticulture and to the production of other agricultural cash crops (Singh, 2013).

Today, Kinnaur appears to be following a path similar to that of Kullu's apple economy. Although Kinnaur is currently experiencing what I call its golden era, some orchards located in lower elevations areas are beginning to feel the effect of the fluctuating weather patterns and the Kinnauri apple belt has also begun its gradual migration to higher elevations.

## *Changing Climate in the Kullu District*

A large part of the story of Kullu and Kinnaur is shaped by climate change, which can be attributed to the decline in apple production. Recorded temperatures in the Kullu District since 1985 demonstrate an increase of 1.18 degree Celsius in maximum temperature, and 0.53 degree Celsius decrease in minimum temperatures (Aditya et al., 2013). The data on rainfall from 1973 to 2009 reveal an overall decrease of 27.1 mm, with a decrease of 0.8 mm yearly in annual rainfall (Aditya et al., 2013). Additionally, satellite data for the Kullu District collected by Chandel Vishwa et al. (2013) demonstrate that from 1972 to 2005 there was a ten percent decline in snow cover while barren surfaces increased by nine percent (Chandel et al., 2013). The change in temperature and rainfall has resulted in lower apple production and quality and has therefore necessitated the people of Kullu to seek other livelihood options. Research on the perception of orchardists in the Kullu District on climate change verifies these changes and has disclosed that "Orchard owners were of the opinion that apple orchards are neither left to be productive nor economically viable, particularly in lower Kullu District area due to rise in temperature" (Aditya et al., 2013).

Measures are being undertaken by the apple orchardists of the Kullu District to cope with the challenges of declining apple productivity (Aditya et al., 2013). For example, orchardists believe that under current climatic conditions, higher elevation areas are becoming most favorable for good apple production (Aditya et al., 2013). Many orchardists have therefore moved their apple orchards to higher altitudes in order to produce high yields and better quality apples that are no longer produced in lower-elevation orchards (Aditya et al., 2013). Additionally, orchardists have switched to new apple varieties that require fewer chill hours while producing higher yields (Aditya et al., 2013). As the local microclimate is warming and much of the area, especially in lower elevations (between 1500-2200 meters above sea level), is becoming less productive (Rana et al., 2009), the people of the Kullu District are increasingly transitioning to growing other cash crops such as off-season vegetables, which can be grown in the changing microclimate (Singh, 2013). Horticultural crops such as pomegranates, kiwi, and nectarines suitable to warmer weather are being introduced and planted in place of apples (Gautam, Sharma, & Kumar, 2014; Singh & Singh, 2014). People are also experimenting with floriculture in greenhouses (Aditya et al., 2013). And finally, some people have become apple contractors, purchase apples from orchard owners both inside and outside of Kullu and selling in markets in the plains area.

[62] The Horticulture Department recommends that 30 percent of the total number of trees should be pollinator trees. This recommendation is rarely followed by Kinnauri apple orchardists.

# Kinnaur-Kullu Parallels

This section examines in detail some of the similarities and differences between the two districts for further insight into the potential implications of climate change for Kinnaur. The section will focus on several fundamental changes in land use and livelihoods changes taking place in these districts.

## *Land Use Change*

Land use change can include either changing to a new type of use, or intensifying the existing use. Land cover change refers to a change in the physical condition of the land (Meyer & Turner II, 1996). Land cover is modified by land use in three ways either intentional or unintentional: "converting the land cover, or changing it to a qualitatively different state; modifying it, or quantitatively changing its condition without full conversion; and maintaining it in its condition against natural agents of change" (Meyer & Turner II, 1996 p. 238). Human actions, "representing inputs of material and energy," link land use and land cover change (Meyer & Turner II, 1996 p. 238). According to Pandit and Kumar (2013), the history of land use in the Himalaya goes back 7,000 years. In the last several decades, however, processes of change have accelerated. Some of the most prominent human induced activities that cause land cover change include intensified use of technology and expanding development, population increase, and increase in resource consumption due to affluence (Meyer & Turner II, 1996), all of which can be seen in both Kullu and Kinnaur districts.

Changing socio-economic conditions, technologies, and development, as well as change in policy have led to transitioning land use practices in the Himalayan region (Singh, Rao, & Saxena, 1997; Singh, Maikhuri, Rao, & Saxena, 2008b). The drive to expand commercial modes of production has transformed forests, pasturelands, and small subsistence fields of local traditional crops into terraces of commercial apple orchards (Tucker, 1982). Additionally, as discussed in Chapter Two, changes in legal structures of land ownership through land reforms, specifically the 1974 Himachal Pradesh Village Common Land Vesting and Utilisation Act, allocated what was considered village commons to the landless (Davidson-Hunt, 1995; Sethi, 1991), which was in many cases placed under private commercial apple terraces. Kullu saw many of the same land ownership, rights, and tenure changes that I have described for Kinnaur in the previous Chapter.

| Year | Area Under Horticulture | Area Under Apple |
|---|---|---|
| 1986-1989 | 51 % | 38 % |
| 1996-1999 | 75 % | 59 % |
| 2006-2009 | 77 % | 60 % |

**Table 1: Area under horticulture and apple, Kinnaur**

Source: (Thakur, Kumar, & Sharma, 2014)

Both Kullu and Kinnaur have expanded the area under cultivation in general, and under apples more specifically. Between 1972 and 2005, Kullu District witnessed an increase of 55.26 percent in its area under cultivation (this number includes both crops and horticulture) (Chandel et al., 2013). According to the Apple Growers Association (cited in Vedwan and Rhoades, 2001), in two decades between 1977 and 1997, the area under apple orchards in the Kullu Valley, the most important apple growing belt in the district, increased from 28 to 60 percent. Kinnaur is witnessing changes comparable to what happened in Kullu. As exhibited in Table 1, by 2006-2009, 77 percent of the total cropped area in Kinnaur was under commercial horticulture, of which 60 percent was under apple production, showing an increasing trend in area under apple production (Thakur, Kumar, et al., 2014).

Additionally, both districts have experienced a notable reduction in areas under food grain production, including local and traditional crops. In Kinnaur, secondary and field data confirm that much of the area previously under traditional crops, such as varieties of buckwheat, has been replaced with apples (Minocha, 2015). A district-wide study of Himachal Pradesh with reference to two periods, 1972–1975 and 2003–2006 established that in both Kinnaur and Kullu the proportion of land devoted to food grains has been on the decline as the result of agriculture commercialization and the adoption of cash crops (Thakur, Sharma, & Mohan, 2014). Cultivation of pulses, especially kidney beans and peas as cash crops, is becoming more widespread by Kinnauris (Thakur, Sharma, et al., 2014).

Population, both permanent and transient, has been on the rise, adding to the proliferation and extension of settlements further accelerating land use and land cover change. From 1972 to 2005 the Kullu District saw an increase of 106.26 percent rise in settlements (Chandel et al., 2013). With the rise in population, there has been rapid unplanned development of buildings and road networks on marginal lands bringing about more vulnerability and susceptibility to hazards such as floods, landslides and debris flows (Gardner, 2002). In Kinnaur too, the population is increasing, though the rise has not been as steep as in Kullu.

| Year | Kinnaur's Population | Kullu's Population |
|---|---|---|
| 1971 | 49,835[a] | 192,371[c] |
| 1991 | 71,270[d] | 302,432[d] |
| 2011 | 84,121[b] | 437,903[e] |

**Table 2: Population of Kullu District**

Sources:

[a] (Sharma & Minhas, 1993)
[b] (Government of HP Department of Economics & Statistics Kinnaur, 2013)
[c] (Chandel, Brar, & Kahlon, 2013)
[d] (CSK HP Agricultural University & ICIMOD, 2006)
[e] (Census of India, 2011)

## *Livelihood Diversity*

As discussed in detail above, tourism has become an important income-generating activity for Kullu. Although Kinnauri tourism is still nascent compared to Kullu's, it is gradually emerging.

As in Kinnaur, cultivable land remains scarce in the Kullu District, especially in higher elevation areas. The majority of Kullu farmers belong to the category of small and marginal land holders owning under one hectare of land (Bala, Sharma, & Sharma, 2011; CSK HP Agricultural University & ICIMOD, 2006). After 1975, most of the new orchards in the Kullu Valley, the first area in the district that adopted market-based horticulture, were owned by small and marginal farmers (Vedwan & Rhoades, 2001). This shift to commercial horticulture was initially advantageous to these landowners as it improved the livelihood of this sector (Vedwan & Rhoades, 2001). However, this section of the population has become further dependent on the market and its fluctuations and is therefore more susceptible to variations in both the market and in weather patterns (Vedwan & Rhoades, 2001).

Small and marginal orchard owners suffer most from natural disasters, infestation of orchard pests and disease, and uncertainty in the market. Because these landholders are generally solely dependent on their orchards for cash income, they are seriously affected by one year of failed harvest and have much more difficulty recuperating (Vedwan & Rhoades, 2001). Production failure in one year leads to taking further loans and further dependence on

government services. This was the case in the Kullu Valley when there was a drop after the 1989 peak production, and the impact of the decline was greatest on the small and marginal landowners (Vedwan & Rhoades, 2001).

Studies conducted in the Western Himalaya verify the adverse affect of climate change on the proliferation of pest and diseases in addition to declining populations of pollinators in apple orchards (Partap & Partap, 2009; Partap & Partap, 2002). As winters have become shorter and warmer, pests and diseases are no longer destroyed by the winter freeze. In 1981, the Kullu District orchards became infested with scab, a destructive fungal disease (Vedwan, 2008). Today, canker has become more widespread in Kullu, a disease that causes the tree to decay (Vedwan, 2001). In the Kullu District, the number of sprays have increased from four annually in the 1970s to about twelve sprays in 2001 (Vedwan & Rhoades, 2001). Similar conditions are being noticed in Kinnaur where orchardists are routinely spraying their plantations.

A recent study by Partap and Partap (2009) conducted on the consequences of climate change on the apple economy of the Kullu District revealed that when apple production costs surpassed profits, many orchardists switched from growing apples to growing other cash crops as they could no longer afford the orchards (Partap & Partap, 2009). Partap and Partap's analysis of a survey conducted in the Kullu District concluded that "it took most farmers (65%) 4-5 years to restore their farm economy after the apple farming left them in loss" (Partap & Partap, 2009, p. 13). These farmers were forced to take out loans from banks (Vedwan & Rhoades, 2001). During the 1989 decline, small and marginal orchardists had more difficulty switching from apples to other cash crops such as off-season vegetables (Vedwan & Rhoades, 2001). This difficulty was mainly due to the high costs of converting terraced orchards back into agricultural fields. The initial transition to horticulture requires significant investment to convert the land and wait for the orchard to mature. Replacing these orchards can be emotionally difficult for the owners. In a later section in this chapter I provide a more detailed analysis of the implications of production failure for the Kinnauri small and marginal farmers who are dependent on a single-cash crop.

In Kinnaur too, the average landholding size is small 1.37 hectares (Government of HP Department of Economics & Statistics, 2012-2013), but according to interview data collected in the field, the number of completely landless households is very few[63]. A former Deputy Commissioner, the highest-ranking government official in the district, stated that today about two percent of the entire population is completely landless (Personal communication, May 2016)[64]. Similar to Kullu, the shift to commercial horticulture has been beneficial to the Kinnauri small and marginal farmers. Due to climactic differences and other factors, which I will discuss below, small and marginal landholders in Kinnaur have not suffered from the effects of failed harvests to the same extent as in Kullu.

## Expansion of Off-Season Vegetable Production

As mentioned above, since the 1990s, farmers in Kullu have been converting from apples to off-season vegetables and other horticultural cash crops that can better prosper in the warming climate (Partap & Partap, 2009; Tucker, 1997). When the seasonal production of vegetable

[63] In Kinnaur, those who own up to five *bighas* of land (.40 hectare) are officially considered "landless." Marginal landholders are those with less than one hectare (2.47 acres) or about 12.35 *bighas.* And small landholders are those with one-two hectares (2.47- 4.94 acres) of land. Medium landholders own between four to ten hectares (9.88-24.71 acres), while large landholders are those with ten hectares (24.71 acres) and more.

[64] Official land records data for Kinnaur are not available.

crops ends in the Indian plains, Kullu farmers are able to obtain high prices for their off-season vegetables (Ray et al., 2011). Lower elevation landowners are also switching from apples to other horticultural crops. For example, cherries are less susceptible to variation in the climate, especially during their flowering period between March and April, and are among one of the newer cash crops replacing apples (Singh & Singh, 2014).

# Climate Change Implications on the Kinnauri Apple Production

> My hope is that my grandchildren will continue in the apple orchards. But of course if these problems, like scarcity of water or weather changes, keep happening, then we will see about the future. People will then have to follow the next thing and adopt something new (Interview, May 2013).

## *Local Perception of Climate Change*

Data revealed that the Kinnauri people are cognizant of climate change and the shifting local weather patterns. Their perception corresponds with other research conducted on the environmental, social, and economic implications of climate change in the Himalayan region (Bhutiyani, 2015; Negi et al., 2012; Partap & Partap, 2009; Vedwan & Rhoades, 2001). A survey study conducted by Basannagari and Kala (2013) in Kinnaur on the perception of orchardists regarding apple farming produced similar findings. Researchers surveyed a total of 300 orchard owners in two villages in Lower, Middle, and Upper Kinnaur. The result of their survey demonstrated that about 78 percent of the orchardists of the low altitude reported a decline in apple yield, while 71 percent of those in the upper areas reported no decline in apple yields (Basannagari & Kala, 2013). Additionally, 92 percent of the surveyed orchardists in Upper Kinnaur, 79 percent in the Middle Kinnaur, and 83 percent of those in the Lower Kinnaur reported observing a decline in snowfall (Basannagari & Kala, 2013).

Apple production and its success and failure are directly linked to climatic conditions such as the number of chill hours, hail storms, and the amount of spring snow or rain and whether it is received early or late in the season. These conditions have all started to change, and the research participants recognized this: “weather conditions are no longer favorable. Previously in March it was very cold, but it is much warmer now. When it warms up, flowers start to bud. Then, if immediately the weather changes again, production is affected negatively” (Interview, September 2012). Participants in this research responded that many of the lower elevation areas are beginning to notice a shift in these conditions, leading to a decline in production. Aas mentioned earlier, a similar pattern took place in the 1990s in Kullu’s lower elevation orchards. Interviewees commonly stated a similar pattern of decline as the following interview excerpt, “Production is decreasing every year. Three years back I harvested 200 boxes; two years ago I got 175. Last year we got 125-130 boxes, and this year 109. Year-by-year production is decreasing. Many say it is due to environmental effects” (Interview, November 2012). A key informant interviewee from the Horticulture Department in Kinnaur’s District capital of Rekong Peo verified these claims in detail:

> This year there was profuse flowering and the flowers were beautiful giving us the hopes that we would have a great harvest. But after 95 percent of flowering was completed, there was a sudden dip in the temperature due to which pollination did not happen

> properly. The bees require a temperature of more than 15-18 degrees centigrade, but the temperature was between 3-5 degrees so they could not even leave their hives and so this affected the production of the fruit. Weather then plays a very important role (Interview, September 2012).

These respondents' statements represent a widespread recognition amongst the Kinnauris that the local weather patterns are in fact changing and that the lower orchards are no longer producing the quality of fruit that was possible even a decade ago. Conversely, participants and observations confirmed that the upper reaches, where about 20 years ago it was unimaginable to plant an orchard, are gradually being planted with apple trees. A consensus amongst those interviewed was that in order to harvest superior fruit, orchards must be planted at higher elevations where they receive the required chilling hours and where pests and diseases have not yet proliferated. Otherwise, most of the apple varieties currently being produced in Kinnaur must be replaced with those that can withstand a warmer climate.

> Based on my own knowledge and what others are saying, production is decreasing year-by-year. To maintain the orchards in the lower areas is very expensive; we pay for sprays, fertilizer, and labor. People are saying that the orchards of the lower areas will give us zero income in the years to come. We are hoping that we can have successful orchards in the higher areas, above 8000 feet (Interview, November 2012).

## *Sangla Valley and the Migration of the Apple Belt to the Cold Dry Mountain Zone of Chitkul*

The Sangla Valley, sometimes referred to as the Baspa Valley, is a beautiful and narrow valley reaching around the western and southern circumference of the Kinner Kailash massif along the southern border of Kinnaur District. The tortuous unpaved road, which at times meanders on hairpin switchbacks, follows the raging Baspa River. There are frequent delays when driving in and out of the valley due to recurrent landslides that block the road. The main road in the Sangla Valley was constructed in the early 1970s, leaving the apple economy of the valley about ten years behind that of the rest of Kinnaur. Small villages mark the landscape both on the valley floor along the river and on the sides of the mountains and are encircled by apple orchards. The Baspa River drains this valley, flowing from the glaciers near Chitkul, the last village close to the Indo-Tibetan border, and meandering 95 kilometers before merging with the Sutlej River at an elevation of 1830 meters (6004 feet) (Negi, 1995b).

Chitkul, with a population of about 800, is a frontier border village at an elevation of 3450 meters (11318.9 feet) and is situated in the cold dry zone. It is the last village in the Sangla Valley. Massive mountains loom over the village providing a stunning backdrop. Winters are long and harsh with much of the area under snow. Residents have been mainly dependent on animal husbandry for their livelihood (Singh, 2004). Many are employees of the Indian Administrative Services. Additionally, until recently, the people of Chitkul used the short planting seasons to grow wheat, barley, peas, and potatoes. But as the weather pattern is changing and the area is warming, the apple zone of the Sangla Valley is migrating higher up toward Chitkul. The people of this frontier village are slowly developing their lower lands to apple orchards. According to interviewees, in 2012 the people of Chitkul had harvested about a dozen boxes of apples from their newly planted orchards in an area called Mustarang, which sits

just below Chitkul. These trees were still in their sampling stage, a stage prior to the tree's full fruit bearing age.

The excerpt below is from an interview conducted in the village of Kamru in the Sangla Valley. The interviewee was discussing the changing local weather patterns while using the village of Chitkul as an example of evolving times. In fact, most people interviewed in the villages of the Sangla Valley used Chitkul and its newly planted orchards as an example of how the local climate is changing.

> In Chitkul Village they have not been able to grow apples up to now, but they will produce in five years. They produced about 8-10 boxes last harvest. Times have changed, weather has changed. This winter we have seen so much snowfall. But in general the weather is hotter and hotter year-by-year. There is a place called Mustarang between the villages of Rakcham and Chitkul. Mustarang land belongs to Chitkul people. Last year they produced eight boxes [of apples]. After five years, they will produce much more. (Interview, May 2013)

## Temporary Landscape of Opportunity

> Earlier the higher areas were colder and not suitable for the cultivation of certain crops like apples. Now the climate is getting warmer so even the higher areas are no longer as chilly. So people are moving even higher up to cultivate. But the problem is that there is no land. If there is land, then you can go up, if there is no land, where can you go? (Interview, September 2012)

This section will focus on a discussion of *kandas*—high elevation meadows—and of encroachment, both issues revealing different aspects of a "landscape of opportunity" that is temporary. The changing climate has enabled apple plantations in areas where previously they would not have survived. This section examines how the village *kandas* are being developed as climate change allows for new uses. I will attempt link the migration of the apple zone to higher altitudes to climate change. In particular, this section will look at the increasing practice of encroachment of apple orchards into these areas.

### *Village Kandas*

Landholdings in Kinnaur are generally fragmented as households own at least two or more small parcels of land in different areas. In addition to owning one or more tracts of land around their village, data revealed that most households also have a small plot in the high elevation upland areas known locally as the *kanda*, a general term for meadows. Each village has its own *kanda* which includes high altitude land in the forest and alpine belt far from the village. These areas generally remain snow covered and difficult to reach much of the year except from late spring to early fall. "Almost everyone has land in the *kanda*. Some of land is through *nautor*[65], but some of it is ancestral land. The land in the *kanda* was unreachable during our ancestors' time. But now we are developing it" (Interview, April 2013).

[65] Under the *Nautor* Land Rules of 1968, one of the most significant and effective land schemes in Kinnaur, many of the landless populations were provided with land. For further discussion of *nautor* please review Chapter Two of this dissertation.

Until recently, the lands up in the village *kandas* were typically uncultivated and were used by people to collect fuel wood or grass and fodder and to graze their animals. In areas of the *kanda* where cultivation has been possible, Kinnauris have been sowing traditional crops such as varieties of buckwheat (*Fagopyrum esculentum*). In recent years, villagers have also been using these highland areas to grow one cash crop per year, generally peas or kidney beans, some of which is also used for household consumption. Participants and observations revealed that villagers construct small huts or simple houses in the *kanda* where either one member of the family or the whole family remains for several days or weeks while working the land or grazing animals in even higher areas. As lower elevation orchards lose productivity and suffer more from pests and diseases, the apple zone is migrating to these higher-elevation *kandas*, and these areas, whether under ownership or encroachment, are increasingly being cleared for horticulture or other agricultural purposes. Partap et al. (2012) write, "climate change is enhancing opportunities for cash crop farming in high mountain areas that used to be permanent grasslands until a decade ago. Farmers in the high mountain areas of Himachal Pradesh… are busy planting apples in their pasture lands" (Partap et al., 2012, p. 3). The range of productive economic uses for these lands has expanded and the value of these previously marginal areas is growing as they become superior areas for apple plantations.

When asked about the prospect of continued change in the local weather patterns and its implication on the productivity of low elevation orchards and on the Kinnauri economy, interviewees provided similar comments as the following person who exclaimed, "We will go up. We have so much land in the *Kanda*; there is also water there. Everyone will go to the *kanda*. In the Nichar belt they don't have such altitude so they are not producing good quality apple" (Interview, May 2013). The Nichar belt is located in the Nichar subdivision in Lower Kinnaur. The area is in the agro-climatic zone III, which is considered a temperate wet zone of the high mountains and valleys and sits at an elevation of between 1800-2200 meters. The Nichar belt is forested and receives abundant rainfall (Bajpai, 1981). Orchard owners of this area, as expressed by interviewees, are no longer producing high quality apples due to climatic changes and have gradually begun their transition to other agricultural and horticultural cash crops.

Later in the chapter I discuss a variety of social and economic motivations for the conversion of the high altitude areas into apple orchards, but the main reason for the migration of the apple zone appears to be rooted in the warming of the climate, without which conversion of the area would be impossible[66]. Without the shift in the weather patterns, these areas would be snowbound from the months of September-October until May-June. Under this short growing season, it was impossible to grow any kind of horticultural crops. "Because of the temperature change, people have started planting apples in the higher areas. The temperature is rising day-by-day and leading to the development of more apple orchards, for example, this is happening in Rakcham[67] and Chitkul villages" (Interview, June 2013). Today, those who initially had marginal land up in the *kanda*, or resided in high altitude villages such as Chitkul, are at an advantage as climate change enables them to develop new orchards. When discussing the apple

[66] Although climate change is creating a need for the cultivation of these high elevation areas, other causes, such as changing family system and land division between male siblings also motivate people to expand into these lands. The changing family systems and its implication on land issues will be discussed in Chapter Four.

[67] Rakcham is a village in the Sangla Valley located near the village of Chitkul.

zone migration, participants pointed out that now apples are grown near Himalayan Birch trees (*Betula utilis)*[68], which grow at about an elevation of 4,500 m (14,800 ft).

> In the past I had heard that where there birch trees grow, it is not possible to have apple orchards. But now I have been seeing birch trees and have seen apple orchards near them. This is so strange, it is a new thing for us. So, I think that soon in the future, the lower elevation orchards, especially those here in Rekong Peo area, will no longer survive, but the upper elevation orchards will (Interview, November 2012).

## *Encroachment*

As the apple zone moves upward, Kinnauris who don't have ownership rights in the upper reaches, encroach on the *kandas* and other areas. During my field research, I travelled to 35 Kinnauri villages in Lower, Middle and Upper Kinnaur. In many of the villages I documented visible signs of encroachment. New apple trees are planted on an annual basis on the borders of the forests and into high elevation *kandas*. Observations revealed that after one or two years of planting new saplings, the forest is then felled and the area is directly claimed, expanded, and converted into a newly developed orchard. Figure Five illustrates an area above a village in Middle Kinnaur. The photo shows the border of a deodar cedar (*Cedrus deodara)* forest and a recently planted apple orchard. A row of newly developed circular beds has been prepared within the forest in which new apple saplings will be planted. It is considerably more feasible for landowners whose lands border the forests or pasturelands to encroach into these areas, but such encroachment is in no way limited to those with adjacent lands to forests or pastures.

**Figure 5: The transitional boundary between orchards and forest in highland areas, Middle Kinnaur.**

Small round beds are seen in the forest where one-year old apple saplings have been planted. This is a common sight above many Kinnauri villages where gradual encroachment into the forestlands takes place. Photo by author, April 2013

Figure Six below illustrates the *kanda* above a different village in Middle Kinnaur. This area is at about an elevation of between 3,200-3260 meters (10,500-10,700 feet). At the time this image was taken in April 2014, much of the area had been terraced and planted with one-year old tree saplings. Additionally, a section of this area where a blue pine *(Pinus wallichiana)* forest stood had been burned to clear the land for more plantations. I later brought up the matter with

[68] The bark of this birch was used as paper, especially for writing sacred scriptures.

one of my key informants and a government official in a department that specifically manages issues related to land conservation in Kinnaur. He replied:

> Person who burn are generally those who encroach on the adjoining land. Yes, burning is common; cutting and burning are both common. In the upper reaches, people burn and use the ash as fertilizer. Big trees are being burned. People are only thinking in terms of the next 10 years. They don't think in longer terms. They don't think about global warming and they don't try to safeguard against global warming (Interview, April 2014).

**Figure 6: A *kanda* in Middle Kinnaur.**

This area was part forested and part pastureland. As the image illustrates, the area has recently been developed into terraced fields and planted with new apple trees. Photo by author, April 2014

## Various Factors Enabling the Development of Formerly Marginal Lands

While climate change is one factor necessary for the development of high elevation apple orchards, there are a number of other factors that also contribute to propelling this development. In addition to the climatic, environmental, and political conditions discussed above, other factors, including those of economic and demographic nature, are leading to further expansion of orchards, which I will discuss in this section.

India is the fifth largest producer of apples in the world (US Department of Agriculture, June 2015), the majority of which are for the domestic Indian markets. Apples have been among one of the most expensive domestic fruits in India. Due to the relatively high price, apples have

been limited to the consumption of the middle and higher income sectors of Indian society. India's overall economy has been growing, however, and as the Indian middle class continues to expand, more people have access to disposable income to diversify their food consumption and include what was once considered a luxury food item (Deodhar, 2006). This demand has been advantageous to the Kinnauris whose apples are mainly for domestic consumers in far away cities such as Delhi, Mumbai, and Kolkata. Despite the rise in imported apples to India from other countries, the overall growing demand for the fruit and its relatively high prices motivate the Kinnauris to produce more. Interviewees stated that generally after each fall harvest, it is common for Kinnauris to invest part of their earnings in developing new orchards and planting new trees. "Once every year or two we make new terraces which are costly. We have to pay the laborers, and we pay for developing the land into orchards" (Interview, May 2013).

In addition to apple profits and better access to loans and credit that provide capital for expanding orchards, an improved transportation system has provided easier access to the markets outside of Kinnaur. Additionally, access to, and availability of, outside labor has enabled the Kinnauris to spend fewer hours engaging in the arduous back breaking work in the orchards themselves. Instead, field data revealed that Kinnauris spend that time managing more orchards by supervising the laborers[69].

Another factor contributing to development of formerly marginal land is people's knowledge of horticultural practices. Since the apple economy has been in place, practical knowledge about apple cultivation and marketing has extended to all sectors of the Kinnauri society, including many of those who had initially been excluded from this practice for lack of awareness or financial means. Government agricultural science stations throughout Himachal Pradesh, including in Kinnaur, conduct research on best horticultural practices and disseminate that information to orchard owners. In general, the knowledge of apple cultivation has grown amongst the average person. This is despite the majority of my respondents confessing to emulating their neighbors' practices in the orchards rather than attending to the particular requirements of their own orchard, especially when it comes to using chemical sprays[70].

Another factor contributing to orchard expansion includes the rising Kinnauri population and overall scarcity of land resources. A growing population in Kinnaur and the desire to live in single family households rather than in a traditional joint family or polyandrous systems, is driving male siblings to partition their land into smaller-sized parcels, which motivates some to seek vacant land elsewhere[71]. With population growth and continuous division of land, land resources have become scarcer in the entire district, and people therefore seek new areas to be placed under orchards.

## Possible Negative Ramifications of Climate Change

Because of insufficient spatial resolution of climate models in mountain areas, it is quite difficult to predict future scenarios of climate change in such regions (Ebi, Woodruff, Hildebrand, & Corvalan, 2007). However, "the physical principles of the albedo effect support projections of continued greater warming in mountainous areas and high northern latitudes" (Ebi

[69] For a discussion on labor issues in Kinnaur, please refer to Chapter Four.
[70] Though respondents discussed health effects such as experiencing headaches and rashes during spraying schedules, observations and interviews revealed that the use of protective measures has not yet been adopted.
[71] Fraternal polyandry has been traditionally practiced in Kinnaur, although on the decline today. For a detailed discussion of the implications of the changing family dynamics on land issues, see Chapter Four on Social Dynamics of Kinnaur.

et al., 2007, p. 266). Although the Kinnauris are currently taking advantage of the consequences of the shifting climate, this situation will change, as it already has in lower areas.

Elements adversely affecting yields and quality of apples include "the role of spring frost, hails, summer drought and unseasonable spring rain" all of which are occurring more as the weather patterns are shifting (Jindal et al., 2004, p. 68). Early cold weather in the form of snow in December and January is crucial as it supplies the soil with required moisture. However, later cold spells in April, delay blossoming and disturb bee pollination. Additionally, spring rains can potentially wash away the flower pollen and, again, adversely affect pollination (Vedwan & Rhoades, 2001). Many of the traditional crops that bloomed during different times in the growing season and provided food and habitat for pollinators have been replaced with monoculture-based apple orchards and other cash crops such as off-season vegetables (Partap et al., 2012). These monoculture orchards require chemical pesticides, which are contributing to a decline in the number of pollinators. "We have a lot of insects that are good for our orchards. But with any small disease, people immediately use spray which will kill the insects. Too much spray will negatively affect us" (Interview, May 2013). As climate change progresses, pests and diseases affecting lower elevation areas will likely also migrate into higher areas affecting the newly planted orchards in the *kanda*.

Higher elevation, steep lands tend to have less fertile soil, and may be depleted more quickly than areas in lower elevations. It is uncertain whether these areas may be able to sustain productivity in the long run. According to a study on soil and hydrological characteristics of various types of land-use in Kinnaur, the *kanda* land is generally located on very high slopes, unstable, and susceptible to water and soil erosion (Sharma & Minhas, 1993). During their field research in the early 1990s, the researchers determined that in some parts of the Kinnauri *kanda* the soil was deteriorating and therefore exposing the subsoil (Sharma & Minhas, 1993). With apple pests and diseases continuing to plague orchards, especially with the rising of temperatures, people are bound to use chemical fertilizers in these upper elevation orchards. As marginal soils do not respond well to chemical fertilizers (Jodha, 2005b), these orchards too will produce low yields in the years to come.

In the last decade, Kinnaur has been subjected to extreme weather conditions causing major loss of life and livelihoods. In 2013 the district witnessed severe winter storms causing avalanches and landslides destroying orchards and closing roads, severing communication and cutting off villages for weeks. Later in the summer of the same year, extreme monsoonal rains further caused damage through cloudbursts that triggered landslides and again loss of orchards. Figure Seven illustrates damaged buildings and adjoining apple orchards in a village in Middle Kinnaur. Landslides during the severe monsoonal rains in the summer of 2013 destroyed many orchards, especially those in Upper Kinnaur where the rains were most severe. Extreme and unpredicted weather conditions are becoming more common in the Himalaya (Chaudhary & Bawa, 2011). With susceptibility of the high slopes of the *kanda* to soil and water erosion, extreme weather activities can easily damage orchards through avalanches and landslides.

A study by Rawat (2002) showed that on average, about 86 percent of the total annual income of a Kinnauri household is gained through agricultural activities, of which about 50 percent is from fruit crops, mostly apples. The rest is generated from off-farm activities including employment with the Indian Administrative Services and private business (Rawat, 2002). Apples provide a substantial share of annual family income in Kinnaur. If Kinnaur continues to face extreme weather calamities without a period of respite to recuperate from losses, and if the district suffers from a declining apple economy as the District of Kullu did, it

may cause socio-economic hardship, especially for small and marginal landholders. Replacement of traditional crops with apples has meant that most people in Kinnaur rely on purchasing their subsistence requirements from the market. Oral history interviews with elders provided similar statements as the following:

> Yes, in those days we had no money, but we were self sufficient for our own food. We had all the traditional crops to feed ourselves and we also had apricots and walnuts. We don't have these traditional crops anymore. And today we don't have very many apricot and walnut trees. Now even if we want flour we have to go to the market and buy it. In those days we had money problems, but we had our food to feed ourselves. Now we only have apples (Interview, October 2012).

**Figure 7: Destroyed buildings and apple orchards from landslides during the 2013 monsoon season, Middle Kinnaur**

Photo by author, April 2014

## Chapter Conclusion

This chapter examined the role of climate change in Kinnaur's economic transformation into a successful apple-producing region. Over the past several decades, the widespread cultivation of apples has ushered in an era of prosperity in a region that had previously been remote, marginalized, and had little economic opportunity. Climate change has contributed to this prosperity by expanding areas suitable for apple growing and other crops. I have argued that Kinnaur's experience to date runs counter to the dominant theme that rural natural resource-

dependent societies, especially those in the Global South, disproportionately bear the destructive consequences of climate change (Adger, Arnell, & Tompkins, 2005; Kates, 2000; Mearns & Norton, 2010b).

Kinnaur's experience shows that climate change can provide advantages under certain circumstances. Climate change creates both winners and losers, and that opportunities and constraints can arise at different spatial and temporal scales. In the case of Kinnaur, climate change in conjunction with the region's political, economic, and social processes has created a temporary landscape of opportunity. It is this temporary profitable outcome of climate change that has thus far been missing from other studies.

Despite demonstrating the immediate benefits, my research also suggests that the current Kinnauri prosperity may be limited. Balanced against the climate-related expansion of arable land, are emerging risks to long-term agricultural productivity. Already, lower elevation orchards have experienced reduced productivity and increased pest and disease problems. As the climate warms further, higher elevation growers may also experience these challenges. Weather volatility appears to be increasing, bringing destructive storm events – a particular risk for those growers on marginal or exposed sites. Other risks include depletion of thin upland soils with limited organic matter, and potential decline of glacial water sources. Further, apple orchards on steeper upland sites are often at greater risk of landslide, particularly where prior forest cover has been entirely removed due to encroachment. Finally, extreme dependence on apples may leave Kinnaur highly vulnerable to a change in market conditions. All of these factors suggest that a strategy of livelihood diversification may be prudent, despite the positive current conditions that support apple monoculture. The apple "boom" in Kinnaur has created a window of opportunity, which Kinnauris may or may not leverage to their long-term benefit.

There are other circumstances that have assisted the development of Kinnaur and increased the adaptive capacity of the Kinnauris, which may support continued prosperity. These conditions include for example, development of transportation and telecommunications infrastructure, as well as the effects of greater wealth and access to government support. Under these circumstances, the Kinnauris may be able to adapt and continue to prosper even if warming temperatures make apple production unprofitable. Winners and losers emerge based on their available resources and their ability to adapt to or withstand change (Kelly & Adger, 2000). However, unchecked environmental degradation due to, for example, overuse of chemical sprays and the conversion of forest and pastureland to commercial apple plantations, in concert with more extreme weather patterns, may create significant change in the system that would make the future Kinnauri adaptation difficult.

As the climate continues to change, it remains to be seen how Kinnaur will adapt. Can Kinnauris exploit their deep understanding of the local mountain climate and hazards to meet the challenges of a changing climate and economy? Does it make more sense for Kinnauris to diversify away from apple production in anticipation of risks, or should they maximally exploit the apple economy while it exists? Future research is required to determine these factors by documenting continued change and transition.

My work deepens and broadens the debate by providing a conceptual framing that augments the biophysical research on climate change and demonstrates a different angle on this phenomenon, one that is missing from other studies. The conceptual framing put forth in this chapter shows that climate change has thus far created a temporary landscape of opportunity for Kinnaur. The results of my work also contribute to academic debates and broader literature on ecological adaptation. Further, my study contributes to policy discussions surrounding the issues

of global climate change by highlighting the temporary positive outcome scenario. My analysis illustrates the importance of ethnographic and contextual study when investigating the implications of climate change. Issues such as local perception, political economy, and historical factors are all important areas for examination.

# Chapter Four: Continuity and Change: Livelihoods and Collective Social Arrangements

## Chapter Introduction

### *Prelude*

My research assistant and I had been trying to secure an oral history interview with an 82 year-old gentleman in the village of Kalpa for some time, but had failed as he was generally busy working in his orchards. We had heard about his knowledge of the area, and we had also interviewed his son who lived in a different village. We finally managed to catch him at home on an early November morning. We sat on the ground outside of his beautiful traditional home above the Kalpa bus stand, overlooking the village. He was a carpenter and a mason who had built his home himself, and the precision of his work showed in the beauty of the structure. The majestic Kinner Kailash Mountain Range loomed over the village of Kalpa. The mountain had received a fresh layer of snow the night before, bringing the snow line lower and threatening the approaching winter. Below the skyline sat several prodigious snowcapped peaks, and below them were the deodar cedar and pine forests merging into the apple orchards. As we sat in the sun conducting the interview, our host kindly brought us breakfast consisting of eggs, *roti* and *chai*[72]. Sounds of life emanated from all directions with children crying in a home nearby and others yelling as they played, stones being pounded during the construction of terraces, timber being sawed from another house above us, dogs barking, and people conversing from one home to another. At times too, we could hear the sound of cars and activity from below on the main Kalpa road. From where we sat, I could see how much the village infrastructure had developed even since my first visit in 2010. There were now more roads and vehicles, and more connectivity in general, including Kalpa's telecommunication tower, which could be seen rising above the forest not far away[73].

Our gracious host was comparing life prior to the apple economy to changes witnessed in Kinnaur in the last several decades. Similar to many other elders with whom I conducted oral histories, this gentleman was referring to a difficult, yet simpler life prior to introduction of cash and market integration. In the past, the landless, who constituted most Kinnauris, worked as peasant cultivators on the fields of the upper caste landowning class[74] and were sometimes under pressure from their landlords to produce more. Though they were bound to their landlord for much of their survival, they did not require cash to maintain the land. Instead, they worked collectively, sharing resources of their households and surrounding areas, in a centuries-old sustainable pattern of survival that included gathering resources from the forest, irrigating fields and more. As the apple economy expands, however, and Kinnaur becomes more integrated with the larger Indian economy, Kinnauris act independently far more often than in the past, which is changing their lives and the landscape around them.

[72] *Rotis* are flat bread, and *chai* is typical Indian tea with milk.
[73] These changes were punctuated by my reception of a phone call from my mother in the US during the interview informing me that Barak Obama had just won his second presidential term.
[74] For a detailed examination of land issues in Kinnaur, please refer to Chapter Two on land tenure issues in Kinnaur.

> Today, people have a lot of money and can survive better. If we want to go for development and improvement[75] of our land, we need a lot of money. In those days, we didn't need a lot of money. We grew our own food and lived on that. Yes, there were sometimes pressure from the landlords, but things were good. Today we need much more money to survive. Now there are roads constructed everywhere. In the past there were no roads and we would go to Rampur[76] on foot to trade. We collected everything then[77]. Now we are not collecting anything. The shop is nearby and if we need anything we go to the shop in one second and get what we need. Overall, the past was simpler. I was a woodcutter and received four Rupees per tree. I was also an assistant mason for one and-a-half Rupees per day; this went up to five Rupees after some time. Today, we get more than 200-300 Rupees in one day and within minutes we spend it (Interview, November 2012)

## *Introduction*

Prior to India's independence and the integration of the broader market, the Kinnauri traditional livelihood system was based on a complex set of reciprocal economic and social relationships within the household and the broader village community. The Kinnauri situation has been characterized by their mountain specificities to which they have adapted with traditional survival strategies (Jodha, 1990, 1997). Environmental uncertainty in the harsh mountain landscape and seasonal risks encouraged cooperation and interdependence through different horizontal and vertical social networks within society on a variety of activities including the management of common pool resources, agricultural production, social and family structures, and trade migrations. Mutual exchange provided individuals with security while living with uncertainties. Reciprocal relationships through different networks enhanced the diversification of livelihood strategies, especially in difficult times, and thereby reduced risks. Flexible social networks of cooperation at the household and village levels have therefore been central to survival in the face of land, resource, and labor scarcity. In the last seven decades however, and especially since the 1990s, this system has been shifting. Previous chapters have focused on political concerns of land ownership and land reform, and on the apple economy and the impact of climate change. I now turn to examine the consequence of these changes on social arrangements.

Since the mid 1950s, changes that were brought about as the result of India's independence have had significant impact on the Kinnauri ecological and social structures that have been in place for generations. Here I discuss the social dimensions of the Kinnauri temporary landscape of opportunity and especially the question of whether the current changes in Kinnaur are sustainable. This chapter explores: 1) the consequences of market integration on the sustainability of the Kinnauri system and how the Kinnauri social dynamics are changing as the result; 2) changing patterns of shared resources and shared labor and their ramifications on social

[75] The first step in planting an orchard is "development and improvement of the land," which generally means converting the sloped land into terraced orchards, a costly endeavor.

[76] Prior to India's independence, Kinnaur was part of the Princely State of Rampur-Bashahr which was the largest kingdom in northwestern Himalaya (Moran, 2007). Much of the trade between Tibet and Bashahr took place in the small town of Rampur situated on what is today National Highway 22, halfway between the city of Shimla and Kinnaur. Rampur held the seat of the Bashahr Empire and it was home to a well known and popular festival called the Lavi Fair which was held annually in November.

[77] The interviewee's mention of "collecting everything" refers to subsisting on traditional fields and traditional fruit trees.

dynamics at the household and broader village levels; 3) changing patterns of adaptation; and 4) the implications of these changes on property arrangements and the overall Kinnauri social system.

Data collected from field observations, interviews, focus group discussions, and secondary historical material on Kinnaur serve to describe the shifts in Kinnauri society as perceived by the people of Kinnaur, and the possible ramifications of these transformations for the future of Kinnaur. These data suggest that market integration and geopolitical circumstances are linked to the abandonment of the Kinnauri traditional subsistence practices, in return for a cash-based economy that may not prove sustainable in the long-run. In a severe mountain environment such as Kinnaur, traditional survival and risk management strategies necessitated collective action in the form of participation in different horizontal and vertical social networks. People who are part of well-established social networks with norms of reciprocity and trust are more apt to participate in collective action from which they mutually benefit, and they are less likely to behave opportunistically against collective interests (Putnam, Leonardi, & Nanetti, 1993). The value in such social arrangements is what has been called "social capital," which describes productive activity generated as the result of people's relationships (Coleman, 1988). Participation in social networks facilitates its members to enhance their economic and social well-being (Putnam et al., 1993). Societies are believed to use coping strategies that include livelihood diversification and social capital to adapt to risk and severe environments (Goulden, Adger, Allison, & Conway, 2013). In the case of Kinnaur, with the growth of market economy, these traditional social networks are weakening and therefore resulting in changing social dynamics. The loss of the value of these relationships is one of the costs of Kinnaur's current prosperity.

I discuss the traditional human-environment interactions and linkages that have manifested in Kinnaur through what Jodha (1998, p. 286) calls "a two-way adaptation process." This process entails societal adaptation of its needs to its natural resource systems, and adapting the natural resource base to fulfill society's needs (Jodha, 1998b). My examination focuses on collective action and decision-making strategies at both the household and village-levels, which historically have been paramount factors for Kinnauri survival in, and adaptation to, their severe mountain environment. I examine three specific examples related to evolving social-environment dynamics that represent larger transitions in Kinnaur. These include fraternal polyandry and joint family systems, cooperative labor arrangements, and the *chilgoza* pine nuts, which traditionally have been an important common pool resource in Kinnaur. Each example illustrates that participation in social networks provided Kinnauris with social and economic safety nets and protection against risk. My results suggest, however, that traditional livelihood strategies rooted in networks of social exchange and reciprocity have weakened as market integration has deepened in Kinnaur. My findings also illustrate that despite having other supplementary sources of income, livelihood diversification is gradually declining as Kinnauris' main livelihood activity is dependent on the production of monoculture apple plantations.

The traditional Kinnauri family structures are evolving from fraternal polyandry and joint-family households to monogamy and nuclear family units. In polyandrous societies of the Himalaya, economic factors have been associated with marital choices (Goldstein, 1987b; Tiwari, 2001). With more available economic opportunities and social mobility, the younger generation is no longer seeking the safety net of a polyandrous household. This transition in the Kinnauri family structure is consequently instigating land partitions and affecting the use of resources such as land, forest, and water. These new patterns of change will impinge on not only

the apple economy, but on any future agricultural or horticultural (land-based) cash crop production in Kinnaur. My second example related to aspects of changing social systems includes the decline in the networks of collective management and decision-making, especially in community cooperative labor arrangements. The weakening of this system of cooperation is slowly contributing to a decline in community solidarity and cohesion while steadily increasing individual action. People participated and cooperated in groups and social networks vertically and horizontally across socio-economic boundaries for a shared gain, and thus produce a foundation for solidarity and social cohesion (Field, 2003; Putnam, 2000). And finally, my third example will investigate the transition of the system of management and use of the *chilgoza* pine nuts, a common pool resource, which has had important implications for the ecology, economy, and cultural heritage of Kinnaur. The importance in the value of apples as a cash crop has superseded the significance of the *chilgoza* pine nuts and the collective system with which it was traditionally harvested. These transformations will be examined in detail in this chapter. The chapter will use the interrelated thread of social networks of cooperation to weave through examples of changing social dynamics in Kinnaur.

## *Reciprocity and Social Exchange*

Prior to the market economy, Kinnauris engaged in an intricate system of social exchange that served as social insurance for members of society. This was to buffer against risks incurred through environmental, agricultural or human-caused misfortunes. Because living a subsistence life is filled with uncertainties, the pre-capitalist cultivators could not afford to incur any risk (Chambers, 1997; Scott, 1976). Pre-market mountain societies, such as Kinnaur prior to the 1950s, devised technical and social arrangement to ensure their survival, including practices developed over years, for example, mastering traditional local seed varieties, becoming knowledgeable in planting timing, or breeding animals that were adapted to cold dry mountain environment, much of which was done through varying social networks (Scott, 1976). Social arrangements included patterns of reciprocity within their network, be it patron-client relationships, the broader village community, or the extended familial circle. These arrangements and relationships served to protect the peasantry from the consequences of some minor event—for example, shortages of food supplies, or loss of animals due to harsh conditions— that can overwhelm a person living in a severe and inhospitable landscape, what Scott (1976, p. 3) calls, “ripples that might drown a man [sic].” Social arrangements however, provided a significant source of welfare and safety. An implied sense of obligation or mutual agreement existed and served as a form of social insurance sharing vulnerabilities and protecting against risk, where exchange was engaged in during good times and was to be claimed during times of need (Davies, 1996; Swift, 1993).

Subsistence agro-pastoralism was arduous, and there were periodic food shortages, natural calamities, and conflicts, but the risks of living under harsh resource-scarce conditions, like those in Kinnaur, were mitigated by their diverse agro-ecological production systems and social practices that relied on a great degree of cooperation and mutual social interdependence. These interconnected production systems all required collective action, social cooperation, and reciprocity amongst members of the household and the broader village society. In Kinnaur, traditional survival strategies incorporated the use of spatially and seasonally linked diverse land-based strategies, which directly tied together subsistence agriculture, animal husbandry, cross-border trade, and the use of common pool resources such as water and forest products. The Kinnauri practices of fraternal polyandry and common labor enabled households to subsist relatively safely while participating in these reciprocal social arrangements.

## *Livelihood Sustainability and Diversification*

The sustainable livelihoods debate took a turn in the 1990s from a focus on people's impoverishment to paying attention to people's agency, needs, and opportunities. This shift took root with a foundational definition introduced by Chambers and Conway (Chambers & Conway, 1992, p. 6), and then modified by Carney (1998) into the definition I use:

> A livelihood system comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base (Carney, 1998, p. 2).

The term "capabilities" focuses on the ability to choose and to perform, the ability to use resources that are available, and to live a life one values (Sen, 1984, 1987). It is as important to consider people's capabilities and well-being as it is to consider their needs, as "Capabilities are means to livelihood and wellbeing" (Chambers, 1997, p. 1748). This view places people, their needs, and their opportunities at the center of analysis of livelihoods (Scoones, 1998). This approach centralizes how people themselves view their own needs and give meaning to their own world (Bebbington, 1999). Chambers and Conway (1992, p. 4) maintain that livelihood capabilities include having the ability to cope with calamities and proactively responding and adapting to change, having access to information and services, and "exploiting new conditions and resources." It is argued that a sustainable livelihoods approach will reduce poverty (Carney, 2003; Chambers & Conway, 1992). While this claim may be true in the long run, we can clearly see in Kinnaur an immediate economic benefit from economic developments that do not appear sustainable, especially in the long-run. To fully comprehend the idea of livelihood, factors such as "less obvious social resources, organizations, local politics, and ethnic and social networks and decision making that underpin economic activities and can effectively reduce or increase social vulnerability to economic and political change" must also be examined (Michaud & Forsyth, 2011, p. 13).

### Resilience and Livelihoods Diversification

Resilience has been defined as that which "determines the persistence of relationships within a system and is a measure of the ability of these systems to absorb changes of state variables, driving variables, and parameters, and still persist" (Holling, 1973, p. 17). This definition refers to an ecological system's ability to maintain its core function when exposed to change and perturbation. Social resilience is defined as "the ability of communities to absorb external changes and stresses while maintaining the sustainability of their livelihoods" (Adger, Kelly, Winkels, Huy, & Locke, 2002, p. 358). The resilience of social and ecological systems are linked, as social systems are dependent on ecological systems (Adger, 2000; Berkes, Folke, & Colding, 1998). Social resilience is shaped by a diversified livelihood system, access to resources, and responsive social institutions, which can help communities to absorb external shocks and perhaps respond positively to them (Adger et al., 2002; Adger, 2000). "The most robust livelihood system is one displaying high resilience and low sensitivity; while the most vulnerable displays low resilience" (Ellis, 1998, p. 14). Less community resilience in the face of shocks will lead to turmoil, which can then lead to resource degradation and loss of livelihoods (Adger et al., 2002).

Increasing evidence suggests that livelihoods, especially in a rural setting, are complex, context-based and generally rarely rooted in one single activity (Ellis, 1998; Gaillard, Maceda, Stasiak, Le Berre, & Espaldon, 2009). Livelihood diversification is the "process by which (rural) households construct an increasingly diverse and complex portfolio of activities and assets in order to survive and to improve their standard of living" (Ellis, 2000b, p. 14). Diversification in livelihood activities in rural areas generally reduces poverty (Ellis, 2000a). When livelihoods diversify, people have more options as they rely less on a specific natural resource, cash flows increase, and expanded human capital allows for diversification of new knowledge and skills (Ellis & Allison, 2004). Additionally, livelihood diversification will enable people to endure and adapt to extreme climatic activities and are used as an overall risk management strategy (Block & Webb, 2001).

Livelihoods are sustainable when they provide an adequate flow of input that can maintain year-round household consumption patterns (Smith, Khoa, & Lorenzen, 2005). Although consumption continues throughout the year, rural livelihoods, especially those dependent on land-based activities in mountain areas are subject to seasonal change and fluctuations. Diversification of livelihoods addresses seasonality, in addition to mitigating loss in light of calamities and shocks (Ellis, 2000a). Households develop dynamic and diverse strategies of survival to fulfill their requirements (Chambers, 1995; Scoones, 1998, 2009). Different members of a household frequently devise diverse activities in which they partake at different times during the year (Chambers, 1995). As discussed below Kinnauris took advantage of agro-pastoralism, trade and use of common pool resources. These diverse activities were undertaken by each of the co-husbands of a fraternal polyandry household.

Traditional systems are sustainable under conditions of subsistence production, low population pressure, and limited outside influence (Jodha, 1998a). Under these conditions, production systems are adapted to the available natural resource base of the area while resource management practices include regeneration and conservation (Ellis-Jones, 1999). When these conditions change under circumstances such as increased populations, state intervention, and market penetrations, as in Kinnaur, traditional management practices that were sustainable may be abandoned and resources are over exploited (Ellis-Jones, 1999).

## *Common Pool Resources*

Common pool resources may be managed according to common property rights arrangements with collective rights to that specific property, they contain institutions and rules for access and joint use, all of which are imposed by local communities (Bromley, 1992; Bromley & Feeny, 1992; McCay & Acheson, 1987; Ostrom, 1990). Actions that have been authorized are referred to as "rights" (Ostrom, 1976). "Rules" are "prescriptions that create authorizations" and thus, "rules" produce "rights" (Schlager & Ostrom, 1992, p. 250). Common pool resources that are managed under common-property resource management regimes have two characteristics. First, it is generally difficult and costly to exclude users from these resources, and second, one person's use of resources takes away from the benefit of others (Ostrom, 1990). Generally it is believed that increasing market integration will reduce the effectiveness of common resource management (Colchester, 1992; Jodha, 2007; Young, 1994) and that changes taking place as the result of market economy and commercialization alter common property systems as individual and group interests change (Davidson-Hunt, 1997). These claims appear to be true in my observations in Kinnaur, most obviously in the management of the *chilgoza* pine nuts, which are no longer being managed effectively. These

assertions also apply to my example of fraternal polyandry. In this research, I am treating the polyandrous and joint family systems as a unit through which the household and resources are managed commonly by a set of brothers. Both characteristics discussed by Ostrom can be applied to polyandrous and joint family systems where brothers or co-husbands are co-owners of their property. I further consider the institution of marriage as the management institution for the family's common property and the household.

According to Nelson et al (2007), adaptation to events and change is most successful when strong diverse community institutions are able to guide appropriately throughout the course of change or disturbance. Adaptive strategies are rules and practices that have been devised by households and communities to secure their livelihood and survival probability (Berkes, Davidson-Hunt, et al., 1998). Adaptive capacity including social, economic, and physical mechanisms are required for a system to adapt to change (Galvin, 2009; Nelson et al., 2007). Agro-pastoralist societies, such as the traditional Kinnauri society, have flexible and adaptable resource management institutions. In the context of social, political, economic, and ecological shifts and transitions, rules of resource management continually change and are negotiated (Behnke, 1995; Berry, 1989; Dekker, 2004; Turner, 1999). Subsistence strategies that were sustainable for generations are no longer the dominant practice in Kinnaur. My investigation will provide an analysis of the Kinnauri adaptation to these changes, and the implication of these transitions on the sustainability of Kinnaur society.

# Traditional Agro-ecological Production System and the Use of Landscape

## *Pastoralism and Trans-Himalayan Trade*

A combination of subsistence agriculture, the use of forest products, and livestock rearing, which includes transhumant pastoralism[78] in many areas, has been the primary survival strategy of the people in the Western Himalaya (Ives & Messerli, 1989; Maikhuri, Rao, & Semwal, 2001; Singh, Maikhuri, Rao, & Saxena, 2008a), and is commonly practiced in many mountainous areas globally (Galaty & Johnson, 1990). The Kinnauri traditional livelihood also depended on this three-part system, although in addition to pastoralism[79], Kinnauris also used their animals to engage in trade. Prior to the expansion of orchards in Kinnaur, livestock rearing was a common practice. Most Kinnauri households owned animals such as stationary cattle, and migratory sheep, and goats[80]. Just as the lack of cultivable land prevented Kinnaur's residents from depending solely on arable agriculture, Kinnaur's lack of sufficient pasturelands meant that pastoralism was never a mainstay of the Kinnauri livelihood as it has been with other pastoralist groups (Singh, 2012).

In Kinnaur, pastoralism and trade migrations were more prevalent with upper caste households from Upper Kinnaur, the region of Kinnaur bordering Tibet. This proximity to Tibet provided an easier access for sojourning over the high mountain passes into Tibet. Further, the

[78] Seasonal and cyclical movement of people with their herds, who at varying degrees link agricultural activities and livestock breeding. This is typically a vertical movement to complementary ecological zones, i.e., higher pastures in summer time and lower plains in the winter time.

[79] Arbos describes mountain pastoralism as movement or migration within the lower and higher reaches of slopes in the same mountain region (Arbos, 1923).

[80] Though sheep, goat, and cattle were the primary animals, households also owned horses, mules, yaks, and dzo (hybrid animal between yaks and local domestic cattle).

upper caste sector of society, who also constituted the large landholding class, had better access to ownership of large herds of animals. Despite limited transportation technologies, the Kinnauris were superb regional traders and served as intermediaries between the Indian plains and the mountain areas of Tibet, Spiti and broader Central Asia, controlling the main trade routes connecting the Tibetan Plateau to the plains in northern India (Singh, 2003a). The Kinnauri pastoralist traders were vital to the local and regional barter economy. From Tibet they brought wool, cumin, medicinal herbs, salt, borax, goats and sheep in exchange for cereals and cotton clothing (Singh, 2003a). Kinnaur was a traditional place of regional convergence for peoples of different regions of the Himalaya.

## *Subsistence Farming and the Use of Forest Products*

Mixed farming systems have been directly linked to, and heavily dependent on, the use of forest resources (Ives & Messerli, 1989; Singh, 2006b). Forest products provided fodder and litter for animals, which provided an important fertilizer for the fields of traditional crops. Forests also provided fuelwood and other edible products to the Kinnauris. Subsistence farming of small plots of land has been another dominant survival strategy in Kinnaur. While some male members of the family, typically one of the co-husbands in a polyandrous household, went on annual trade journeys across the border into Tibet (Tobdan, 2008), the women generally took part in common farming of traditional crops such as kidney beans, barley, millets, and different varieties of buckwheat. Fertilizer for fields was made locally from animal manure and pine needles from the blue pine and *chilgoza* pine trees[81].

Although this practice is slowly declining, it is still in use today. Interviews revealed that prior to the proliferation of apple orchards, the few households devoid of animals would develop a relationship based on an informal contract with livestock-owning families to whom they would provide forest products in exchange for manure for their fields. This activity further promoted social interaction and exchange within the broader village. Still today these exchange relationships can be found, especially in Upper Kinnaur where participants stated renting hundreds of sheep and goats from the local shepherds, or family or community members who own animals. Animals are rented for several days in order to collect their dung for fertilizer. This service is reciprocated by providing food, lodging, and local alcoholic brews to the shepherds.

Other forest products on which Kinnauris have depended include collection of fuelwood, *chilgoza* pine nuts, which I will discuss in detail below, and several varieties of wild apricots as a chief part of their diet, all of which were collected and processed collectively by networks of kin. Medicinal herbs and edible mushrooms were also gathered. Although the practice of collecting edible forest products still persists today, this activity has diminished greatly with the larger transitioning economy and people devoting more time to their apple orchards.

Since most people have become dependent on apples as the mainstay of their livelihood activity, the economy of the region as a whole has changed, and in many ways improved: "People who owned animals used to go to Tibet for trading. Now all of the animals have been replaced with cars" (Interview, November 2012). Keeping animals requires time, labor, and space. Interviews disclosed that today people's time is mainly concentrated on the orchards, which leaves little time to care for animals. Further, during field observations in the 48 Kinnauri villages visited, I saw that many traditional homes are being replaced with new and more

[81] *Pinus wallichiana* and *Pinus gerardiana* respectively.

elaborate concrete buildings that may no longer include animal sheds to house flocks of sheep and goats. Children who once cared for animals are now in school, as education has become an important priority for Kinnauri parents. Finally, the weakening of joint family and fraternal polyandry systems contributes to smaller family units and, therefore less available labor in each family to care for animals. Today, households who own flocks of sheep and goats, generally hire local shepherds to graze their animals. The following participant encapsulated these changes poignantly as he talks about the importance of animals in the Kinnauri livelihood system and how this is changing.

> Earlier we had this business of animal grazing for wool, but now the rearing of livestock has come to a standstill. With changing society, we are moving away from the old system. Earlier we had good trade with Tibet, but in the late 1950s and after 1962[82], this trade came to a standstill. No one wants to rear animals anymore. So now everything is either business, or apple orchards. Now we mainly have cows for milk and some manure. But rearing goats and sheep is difficult because all the sons and daughters are going to school and college. No one wants to go to the jungle[83] to graze the animals. If we hire a shepherd, then it is costly (Interview, September 2012).

## Collective Cooperation: Social, Economic and Ecological Implications of Polyandry

> In the olden times we lived in joint and common[84] family. We had very good relations in these types of families. But now the new generation is marrying individually and there are no longer good relations. In the olden times it was very difficult time and life was difficult, and that is why people were in common families. They got together to help each other; this was easy for work. This was a very good system without tension. All work was distributed between the different members of the family. But this system is changing, relations are changing and people are no longer good to each other. In the olden times people were not so educated. We had to suffer in those days, meaning that we just accepted everything systematically. Now with education, people are not accepting traditions like our common marriage. People now are educated and they will choose what they want; they have many different ways to choose. In the past people had to accept the way (Mr. Shyam Saran Negi, Interview, September 2012).

In this section, I examine social change related to marriage relations. I will specifically focus on the traditional Kinnauri practice of fraternal polyandry and the implications of its decline. My findings suggest that the declining practice of polyandry is resulting in increased land partition, and may also be contributing to encroachment on pasture and forest land. The Kinnauri social institution of polyandry has been weakening for several decades (Tiwari, 2001), and its consequent impact on property arrangements is becoming more apparent. This decline is also witnessed in the joint family system, the other common system of marriage in Kinnaur. The

[82] 1962 signifies an important transitioning date for Kinnaur. After the 1962 Indo-China war, the border between the two countries was closed and it became militarized, confining the Kinnauri traders to India. Additionally, to secure its border area, the Indian military strategically constructed a national highway through Kinnaur and onward toward the border to have better access to the area.
[83] In Kinnaur and India in general, the word "jungle" is used to refer to the forest.
[84] In Kinnaur, polyandry is referred to as "common marriage."

joint family system is a patrilineal arrangement that has been commonly practiced in India. Under this arrangement, each brother has his own wife and all brothers and their individual families reside generationally in the same household with their parents. The household is typically headed by the brother's parents and later, after the death of the parents, by the eldest brother. In the fraternal polyandry arrangement too, the brothers and their common wife reside in the house of their parents. In lower and middle Kinnaur, the joint family system is practiced more widely than polyandry, which is much more prevalent in Upper Kinnaur. But with modernization, the nuclear family system is becoming more common especially amongst the younger generation.

Polyandry is a form of marriage where one woman has two or more husbands at one time (Berreman, 1962). Fraternal polyandry, the classic form of polyandry, is a marriage union where one woman marries a set of brothers, moves into their home, and adopts their lineage (Berreman, 1962; Crook & Crook, 1988). Though polyandry was practiced more widely around the world in the past, today it is mainly practiced in small pockets in the Himalaya (Levine, 1988; Tiwari, 2001). The significance of this rare marriage pattern has been the subject of much research throughout the Himalaya (Aziz, 1978; Durham, 1991; Goldstein, 1976, 1981; Levine, 1988; Schuler, 1987). The arguments surrounding the origin of polyandry are subject to debate. For example, the practice has been attributed to scarcity in the number of women due to the practice of female infanticide (Murdock, 1949), but this argument has been negated by evidence showing that in areas where polyandry has been commonly in practice, such as Tibet, there have been no examples of female infanticide as a cultural practice (Goldstein, 1976). Indeed, the very idea of female infanticide would be foreign in Kinnaur, where unmarried women were a great asset to a family, increasing the socio-economic status of a household by their added labor to the family unit (Tiwari, 2001).

In Himachal Pradesh, polyandry was a common practice until more recent decades. Polyandry was prevalent in the districts of Sirmur, Shimla, Kullu, Kinnaur and Lahaul and Spiti, although never an enforced custom (Singh, 2006a). In the districts of Sirmur, Shimla and Kullu, polyandry was practiced because of insufficient economic means (Parmar, 1975). These areas also had a custom of bride price. Families who were poor could therefore only afford to have one wife between brothers (Singh, 2006a). In Kinnaur and Lahaul and Spiti Districts however, polyandry was practiced in order to reduce the number of inheritors and preserve the wealth of the family (Singh, 2006a). Polyandry was practiced more widely amongst the upper caste *Rajput* families, although this practice was also prevalent amongst many of the lower caste families who owned sufficient amounts of land (Raha & Coomar, 1987; Singh, 2006a). In Sri Lanka, Tambiah (1966) concluded that polyandry was an arrangement between brothers who were unable to individually support their own families. In a polyandrous union, the brothers maintain their inheritance as a shared resource from which they support a common family at a higher standard of living than they would separately, and they also ensure that their land is passed on to a limited set of heirs (Tambiah, 1966).

Polyandry establishes a "closely knit" family unit as it regulates population growth in areas where limited resources could not otherwise support a large population (Bajpai, 1991, p. 55; Durham, 1991; Goldstein, 1976). In areas with restricted resources and lack of adequate land, like Kinnaur, this practice prevents the division of property while it combines a diverse set of resources (Durham, 1991; Goldstein, 1987a). Both Deuster (1939) and Mamgani (1971) write that prior to British rule, the *Raja* who was the ruler of the state encouraged the practice of polyandry through its decrees. The *Raja* refused the partition of immovable objects such as

property between brothers and penalties were incurred for land division (Deuster, 1939; Mamgain, 1971). Polyandry therefore served against division and fragmentation of ancestral lands.

In high-altitude Kinnaur, where land is scarce and landholding sizes are generally small, fragmentation of the land is to be avoided. As the Kinnauris abide by patrilineal[85] and patrilocal[86] social structure, inheritance of land and other property is divided equally amongst brothers (Tiwari, 2001). Therefore, fraternal polyandry was practiced to retain familial ancestral property, mainly in the form of land and animals, while avoiding land fragmentation between male siblings (Crook & Crook, 1988; Tiwari, 2008). The patches of land that are cultivable require a great deal of labor due to the hilly, dry and rocky condition of the land. In order to obtain maximum yield from the land, resources and labor have traditionally been combined through polyandrous family arrangements. Polyandry was never strictly enforced as a custom in Kinnaur, but was rather chosen by families because it was an advantageous strategy. The Kinnauri people are much more open about intimacy than the people from the plains area and practice "a wide range of cultural values regarding intimacy and permitted marriage types" (Tiwari, 2008, p. 125).

## *Diversity of Livelihoods, Labor and Social Safety Net*

The institution of fraternal polyandry was significantly associated with diversified sources of livelihood as each of the co-husband generated income from different sources. It was the foundation for cooperation through division of labor within the household and the extensive village society. The diverse Kinnauri production system described above, including agro-pastoralism and trade, served as "a single economic unit" and necessitated collective labor and cooperation (Singh, 2012, p. 171).

Polyandrous unions reduce both economic and social risks through their multiple sources of livelihoods. Economically, polyandry considerably lowers financial risks by combining a set of livelihoods from diverse sources. Polyandrous families benefit from collective resources tied to each co-husband's diverse sources of income (Bajpai, 1981). It has thus been called, "an institutionalized form of mutual assistance" (Fisher, 1986). Multiple husbands supply additional income and laborers for the household providing a strategy for minimizing risks as diverse occupations are pooled into one family. Because household birthrates are limited in a polyandrous structure, it is suggested that polyandry was practiced to create balance between the household users and available laborers (Berreman Gerald D., 1987). Brothers share one wife as well as property, labor, and combined income. Politically too, the polyandrous families had more influence in local village politics as they held higher status economically (Singh, 2006a).

Socially, polyandry decreases the possibility of becoming a single widow or father-less child. Natural disasters such as flash floods and landslides are common in the Himalaya and may cause loss of harvest or livestock, and in extreme cases, death of family members, especially men engaged in trade or tending livestock. Additionally, under the *begar*[87] system each household was obliged to provide the *Raja* with an able-bodied male member who became the property of the state to serve as a soldier or a servant, sometimes for months whenever it was

[85] Inheritance or descent through the male line.
[86] A marriage practice in which the newly married people reside with the parents of the groom(s).
[87] *Begar* comes from a Farsi word, *bikar*, which literally means without work. In this context, *begar* means free labor, corvée forced labor that was imposed by the rulers on their subject. This practice was later adopted by the British and forced on the Indians.

required by the *Rajah* or the ruler (Allan, 1991; Cunnigham, 1844). The polyandrous family system safeguarded the family unit against the loss of a male member of the family and his individual income and labor, as there were other co-husbands to replace him during his absence.

Generally, in polyandrous arrangements there are clear divisions of labor, with each co-husband taking on different responsibilities, which separates them spatio-temporally. "Each husband had to take care of something. We needed at least three-four people for all the work. Without common marriage, we would need more children in the household to do all the work" (Interview, April, 2013). For example in Kinnaur, prior to the closure of the Indo-Tibetan border, one co-husband would travel on trade journeys for long periods, while another would be in charge of the household and the agricultural fields, and still another co-husband might be grazing the family animals in far-away pastures. Today, employment in a service job in a different town or village would be another occupation for a co-husband. Combined occupations brought wealth and prestige to the family. Another benefit of fraternal polyandry has been its support of amicable relationships amongst brothers, which helps keep the family unit intact (Carrasco Pizana & American Ethnological, 1959; Prince Peter of Greece and Denmark, 1955).

A young Kinnauri gentleman in his early 30s, and a key informant, was born into a polyandrous family with two fathers. He summed up a common family practice of Kinnauri pastoralism, farming, and animal rearing:

> My younger father[88] stayed home with the fields. My elder father used to go to Tibet with horses and mules. Horses were used for people and mules for goods. My father traded sugar and rice in exchange for goats from Tibet. He would bring back fifty or so goats and would trade most of them here in Kinnaur. He would keep about ten goats for our family. My younger father would then graze the animals. My elder father would also go to the Lavi Mela[89] in Rampur. This is where big trade would take place between the people from the plains and the people from Kinnaur. My father would take wool and buckwheat that we grew in our fields and would trade them for rice and sugar at the Lavi Mela (Interview, September 2012).

Collective resources from several co-husbands contributed to prestige or power for women. During interviews, many middle age and older Kinnauri women, and men as well, stated that women had higher status by being in a polyandrous arrangement: "when polyandry was more common, the woman was in charge of the household as the men came in and out. The woman was the one who collected the income from all the brothers, she was very powerful" (Interview, September 2012).

## *Declining Fraternal Polyandry*

There are multiple possible explanations for the decline of these marriage and family arrangements. The most prominent reasons include market integration, education, increased exposure to outside cultures, and increased wealth as the product of the apple economy. Market integration has replaced a diversified livelihood-base with a uniform occupation of managing and tending commercial apple orchards. On average, a Kinnauri household generates about 86

[88] In a polyandrous family the children referred to their fathers as "younger father," or "elder father," depending on the age of the brothers (co-fathers or co-husbands.)

[89] The Lavi Festival was an annual trading fair in the town of Rampur where goods from the surrounding region including Tibet and the Indian Plains were bartered.

percent of its total annual income from agricultural activities, while income from apples constitutes about 50 percent of this total (Rawat, 2002). Off-farm activities such as employment with the Indian Administrative Services and private business comprise about 14 percent of the total annual household income (Rawat, 2002). Income from the land constituted the primary source of income of all of my interviewees. Although many Kinnauris are employed by the Indian Administrative Services, this income constitutes a supplementary source of income, although a stable one. With increases in household income from apple commercialization, people no longer need to rely on communal pooling of a diverse set of resources to secure their livelihood against environmental risks and uncertainties. For example, as the peril of losing a co-husband to a livelihood activity—e.g., crossing high mountain passes to trade with Tibet—has subsided, so has the need to be in polyandrous families. Additionally, labor arrangements have evolved and rising income has enabled Kinnauris to hire outside labor to work in the orchards, which was once done by family members. The weakening of polyandry also suggests that changes in the economic structure have reduced the importance of local resource constraints. The perception of resource scarcity is no longer driving decisions about marriage and family structure to the same extent as before.

Additionally, as previously mentioned, broader cultural forces have influenced the practice of polyandry, especially in those who have become more exposed to the wider Indian cultural milieu. The spread of Hindu customs from the plains, brings the Hindu promotion of monogamy, which contributes to the decline of polyandry[90] (Allan, 1991). This sentiment was echoed by my participants, especially those in Lower Kinnaur who are closer to the plains area[91]. As modernization creeps deeper into Kinnaur, the power of the village deity, who once dictated all life in the village, is subsiding and resuming more a ritualistic role. Hinduism is spreading further through television programs, and with it social tribal norms, including the practice of polyandry, are changing. And finally, it is possible that land reform policies have affected the polyandry family structure in Kinnaur. As discussed thoroughly in the previous chapter, land reform programs generally allocated land to individual family units (Mehta, 2006). If multiple brothers in a family divided into separate family units, they could collectively obtain more land from the government than if they maintained a single collective family unit. While concrete data proving this are lacking for Kinnaur, further research could explore this possibility.

My observations show that young people of marriageable age prefer to participate in individual monogamous unions rather than follow the footsteps of their parents and grandparents, most of whom were part of joint family or fraternal polyandrous arrangements. Many younger participants in this research mentioned that the practice of fraternal polyandry is stigmatized by non-Kinnauris, being often viewed as a strange and "backward" practice, and young people who now frequently travel outside of Kinnaur for education purposes, expressed embarrassment about this practice when around non-Kinnauris. Tiwari (2001) writes that when government schools were first introduced to Kinnaur in the 1950s, many of the teachers were

[90] The relationship between Hinduism and polyandry is complex and beyond the scope of this research. Polyandry has been mentioned in both Vedic and post-Vedic literatures (Parmar, 1975). Also, the five Pandava Brothers from the Hindu epic Mahabharata were in a fraternal polyandrous marriage with one woman, Draupadi. Although the story of the Pandava brothers is well-known and accepted amongst Hindus in India, it is interesting that Hindus may be stigmatizing the Kinnauri practice of polyandry.

[91] Kinnauris practice a mix of Hinduism, Buddhism, and have a strong belief system in local village deities. Lower Kinnaur is entirely Hindu; while in Middle Kinnaur people practice a mix of Buddhism and Hinduism. In Upper Kinnaur on the other hand, people are exclusively Buddhists following the Tibetan Buddhist traditions, in some of which fraternal polyandry is also practiced.

non-Kinnauris who derided the children for having multiple fathers. This type of mockery and disparagement made an impression on those attending schools at the time that their cultural practices were "backward". Overall, with modernization and the spread of markets facilitating further interaction with the outside world, the traditional Kinnauri norms are evolving and in many cases Kinnauris are adopting mainstream conventions. These changes have been contributing to the transition of polyandrous structures to a monogamous system of family union.

## *Polyandry and Land Partition*

> We have the river down below, the mountain is all around us, and the forest covers much of the land. Landholdings are already small and there is no scope for new land. With family partitions, landholdings are becoming smaller and smaller. Let's say I have 10 *bighas*[92] of land. After one partition each of my two sons will have five *bighas*. They will each make their new residence on their five *bighas* of land. If they each have two sons, then they will have to divide again. So, after two – three partitions they will only have a kitchen garden. In this area we had the polyandry system. This system was very good for this hill area because if there were four brothers, they would have one or two sons together and the family and the land would stay joined. But now everyone wants an individual wife so now the polyandry system is destroyed (Interview, September 2012).

The shift to nuclear families has an array of social and ecological implications for Kinnaur, including on the structure of the apple economy. One of the main consequences of this change is the disintegration of family landholdings and altered property relations: "the family's land keeps getting divided between its sons and one day they will no longer have land on which to even build a house" (Interview, November 2012). In the past, the practice of fraternal polyandry served the interests of both wealthy and poor land owners by keeping intact the landed property of the wealthy and averting the fragmentation of poor people's land beyond the measure of subsistence. Today however, land partition between male siblings has become a common occurrence in Kinnaur. One interviewee, whose perception is similar to others, bluntly said that, "in the future, all big landlords and capitalists, and all those who will be in common marriage or in a joint family household will be in charge of the apple economy" (Interview, November 2012). Large landowners, who make up the minority in Kinnaur, are not in immediate risk by land partition as, depending on the total amount, the divided parcel of land will still remain somewhat large. However, for the majority of Kinnauris who own small parcels of land[93], continuous partition will leave them with yet smaller plots in a generation or two. This was a sentiment expressed by all participants. When I asked what repercussions land division would have, the following interviewee, who shares his land with his two other brothers, replied:

> Of course land division would harm me. If we divide, we will each receive one third of the land. But my two brothers are in a common marriage, so they will have two-thirds of the land in one family, but I will have less and this will affect my income from apples and *chilgoza*. For example, if we harvest 100 kilos of *chilgoza*, I will only get 30-35 Kgs instead of 100, so this will definitely affect me. (Interview, April 2013)

[92] *Bigha* is a traditional land measurement system. In Himachal Pradesh five *bighas* are equal to about one acre, or 0.0809 hectare, and twelve *bighas* are equal to one hectare.
[93] The average Kinnauri landholding size is about 1.37 hectares or 3.39 acres (Government of HP Department of Economics & Statistics, 2012-2013).

## Polyandry and Overall Land Scarcity

The following story of a young polyandrous family in the village of Kalpa encapsulates the issues related to land scarcity, partition, and polyandry. I interviewed two brothers aged 22 and 25 who were married to a young 23-year old woman; they had a one-year old son between them. When my research assistant and I walked up to the family's home, the two brothers (co-husbands) and their wife were outside working. They kindly brought us chairs and offered us tea and shelled walnuts from the previous year's harvest. The Kinner Kailash Mountain Range loomed overhead and was covered with a thick layer of snow from a harsh winter just past. The apple trees around the house were still bare, some showing signs of broken branches from the weight of the heavy winter snow. A Nepali woman—a migrant wage laborer—sat on a mounting pile of stones continuously breaking them into smaller pieces with a hammer, while her two young children played in the dirt nearby.

The younger co-husband was helping the wife with washing a great load of laundry that had been placed in several buckets. Cold water was streaming out of a narrow black plastic pipe that was being held in place with rocks. The helping co-husband was wearing worn clothing that indicated he spent time working outside and in the orchards. This was verified during the interview as he revealed that he was much more involved with household and orchard matters. He also had a great deal of knowledge regarding orchards and rural life in general. The older co-husband on the other hand, was wearing clean-cut urban-styled clothing and sat around most of the time. He was hoping to secure a job that could possibly position him outside of Kinnaur, preferably as a government servant.

Their story was an interesting one as the younger brother (co-husband) and the young woman had initially fallen in love, and they were planning to have a "love marriage." However, during the planning phase, which involved the broader extended families from both sides, it was decided that this should be a common marriage between the woman and both brothers, not just the younger brother with whom she had fallen in love. The main impetus for this decision was to maintain the groom's family's limited landholding. Three years before, the father of the two brothers had partitioned land that he had owned jointly with his own three brothers. After partition, each of the four male siblings and their families had received about eight *bighas* of land, amounting to 1.6 acres, or 0.13 hectares, falling under the category of marginal landholders. Eight *bighas* of land would have qualified the family for land under various land reform programs such as *nautor*[94]. However, many of these programs ended by the end of 1990s and since at the time the joint family landholding size amounted to 32 *bighas*, they did not qualify to receive land. If the two young brothers had each married their own individual wives, they would each receive four *bighas* of land, a very small amount. They had consequently decided to hold on to the eight *bighas* by participating in a polyandrous union. Although the decision to be in a polyandrous marriage was initiated by the parents of these three young people, all three, including the woman, had agreed to the proposal. The young woman was concerned about the future of her children. If she were to birth two sons in an individual marriage, then each of her sons would only receive two *bighas* of land, a very small sum. The decision to be in a polyandrous marriage was agreed upon by all those involved, reflecting the importance of land as a source of livelihood. "We chose common marriage because we didn't want to divide the land. If we had chosen single marriages, which means division, then what would happen to our children? How would they get land?" (Interview, April 2013).

[94] For a thorough examination of land reform in Kinnaur, including *nautor*, see Chapter Two.

### Encroachment[95]

In the previous chapter, I discussed encroachment on public (government and common) lands with respect to climate change and other related factors. It should be noted here that the decline in polyandry and joint families may also be contributing to these encroachment practices. Smaller landholders in lower areas, who partition their land into such small units that can no longer support a family, need to find additional land for orchards, which leads to encroachment on higher elevation areas. Further, nuclear family units place more pressure on local resources. For example, each family unit requires timber for construction of houses, and separate supplies of fuel wood.

## Community Cooperative Labor Arrangements

Reliance on social networks and collective action such as cooperative labor arrangements has been an important Kinnauri traditional norm that has been gradually weakening as the hold of market economy strengthens. This section will use the concept of social capital to examine social collectives and networks with respect to several examples, including cooperative labor and resources, and the consequence of their evolution on Kinnauri social relations. The section will begin by briefly discussing social capital. I will then provide an overview of the traditional Kinnauri social structures and practices as they relate to cooperative labor.

The idea of social capital has been used across a wide range of social science literature and has been variously defined and described (Bourdieu, 1986; Coleman, 1988; Fukuyama, 2000; Putnam, 1995a, 2013). The three dominant definitions used in the literature are those of Bourdieu (1986), Coleman (1988), and Putnam's (1995a). Bourdieu (1986, p. 51) write that members of networks benefit from "the backing of the collectivity-owned capital, a 'credential' which entitles them to credit, in the various senses of the word" (Bourdieu, 1986, p. 51). Bourdieu's use of the term has mainly been on social stratification focusing on how the upper class elite use their social ties to maintain their position. Coleman on the other hand, argues that scoial capital is the result of social processes and interactions (Coleman, 1988). He defines social capital by its function, "It is not a single entity but a variety of different entities, with two elements in common: they all consist of some aspect of social structures, and they facilitate certain actions of actors […] within the structure" (Coleman, 1988, p. 98). Lastly, Putnam's take on social capital includes "features of social life—networks, norms and trust—that enable participants to act together more effectively to pursue shared objectives" (Putnam, 1995b, pp. 664-665; 2013).

For the purposes of this discussion on the Kinnauri cooperative labor practices, I will focus only on the central idea that social capital is valuable because membership in a network is mutually beneficial to those involved. Social interactions rooted in networks of cooperative labor strengthen ties between people. Networks promote reciprocity and trust, and social interaction between members can facilitate mutually advantageous collective action (Putnam, 2013, p. 70). The idea of social capital tries to capture the value of such social interactions and their positive outcomes like reciprocity and trust, which are generally considered assets to a society (Krishna, 2002).

The pre-capitalist Kinnauri society operated through different horizontal and vertical networks of relationships, beginning with their own households, be it polyandrous or joint, moved out to their extended families, spanned to members of the village, and finally widened

[95] Encroachment and climate change are discussed in greater detail in Chapter Three.

more broadly to other Kinnauri villages. Bourdieu (1986) maintains that the extent of one's social capital depends on the size of one's networks of relationships and the economic, cultural and symbolic capital one acquires through his or her networks. The gains from these relationships are made possible on the basis of solidarity (Bourdieu, 1986). Loury (2000, p. 233) writes that "Individuals are embedded in complex networks of affiliations". People belong to their networks of immediate and extended families, and "to religious and linguistic groupings, they have ethnic and racial identities, they are attached to particular localities. Each individual is socially situated, and one's location within the network of social affiliations substantially affects one's access to various resources" (Loury, 2000, p. 233). Kinnauris participated in reciprocal collective labor practices through different networks and groups as these entities provided stronger ties and mutual gains and served as important societal assets.

Networks of cooperative labor practices were common amongst households, kin, and neighbors who lived in small hamlets, and the broader village community. Cooperative labor arrangements provided efficiency in labor for strenuous activities, but they also bound people together relationally through various networks, and produced occasions for alliances and solidarity. Interviewees, especially elders who participated in oral histories, discussed the importance of such arrangements in maintaining the laborious production systems and surviving their severe mountain environment. Elder participants who lived prior to market integration invariably spoke of the difficult life they lived and the amount of daily hard work they had to maintain for their survival. But they also discussed participating in collective labor arrangements to ease their workload. For example, a 94 year old woman stated, "In the olden times it was hard to eat. People had less money and so everyone helped each other. Now everyone has orchards and so people have money and they no longer help each other. These days people hire help" (Interview, September 2012). By "help," she was referring to networks of cooperative labor.

Writing on the livelihood system of the Kullu Valley in the Himalaya, Berkes et al. (1996) claim, "In communities characterized by vulnerability, labour reciprocity is a very important function which establishes and strengthens fallback positions in times of stress, making households more resilient" (Berkes et al., 1996, p. 19). Similarly, in traditional Eritrean societies, people use their local social capital to compensate for lack of formal safety nets and to lessen their unforeseen social costs (Habtom & Ruys, 2007). Laboring in an array of activities as a group protected individuals against risk of mishaps, natural calamities, or ill health, all of which were common occurrences[96]. Bauer has used the phrase "economies of scale" to describe the agro-pastoral production system of the Dolpo of the Western Nepali Himalaya, an idea that may also be applied to the diverse production systems of Kinnaur, for similar reasons (Bauer, 2004, p. 25).

Kinnauris depended on their numerous social networks and engaged in reciprocal exchange arrangements in a number of situations. Irrespective of internal differentiation of wealth and status, cooperative labor arrangements existed within vertical and horizontal relations and provided mutual aid and reciprocity between people of the village. When writing about the Tichurong area of Dolpo, an agro-pastoral region in the Nepal Himalaya, Fisher (1986:176-177) observed, "Despite the internal cleavages of wealth, status, and power, interpersonal relations in the village are pervaded by an aura of diffuse reciprocity." He goes on to write about common labor that, "the basis for recruitment is always reciprocity between parties, whether rich or poor, high marriage class or low, politically powerful or politically impotent" (Fisher, 1986, p. 178).

[96] While interviewing people for this research, I was struck by the number of individuals who, even now, had lost family members due to a variety of unforeseen accidents and illnesses.

Negotiations and arrangements were made between people to exchange labor, and reciprocity was a moral duty. Cooperation between different members of networks forms social cohesion (Putnam, 2000).

There were numerous activities that required cooperative labor involving different networks in Kinnauri. Participants described working together in the fields to sow, fertilize, weed, harvest, and thresh traditional crops. They engaged in labor exchange arrangements to collect fuelwood, shear and spin wool, shell apricot kernels, maintain and repair irrigation channels and agricultural terraces. Interviewees relayed laboring collectively to construct buildings such as homes, grain storage, animal sheds, and water mills. This task generally involved transporting material such as timber and stones from the forest to the area of construction prior to building the structure. Family members and neighbors gathered to assist in the construction, and would generally rejoice and celebrate upon completion with the hosts providing food and other celebratory means such as alcohol and local musicians for dancing. When discussing this last point about the festivities at the end of home constructions, interviewees, especially elders, almost became nostalgic of the day. Shared labor provided an occasion for ritual and celebration. The excerpt below is from a key informant participant, representative of similar comments from interviewees:

> We were part of small hamlets with 30-40 families. We all helped each other and discussed things with each other. For example, in the month of September, 20-30 people would come to me to help me while we would provide food. Then we would all go to the next person's field. Every work activity was done like this, harvesting, collecting firewood for winter, even construction of homes where we collected building material like wood and stones. It was all done collectively (Interview, September 2012).

I asked this key informant to share a specific memory related to common labor. He went on, "After we finished building the last part of our house, its roof, everyone came over for a party. We celebrated with giving food and caps with flowers[97] to everyone. We even brought a sheep, so we had very good food" (Interview, September 2012). When I asked when the system of cooperative labor began to decline, he laughed and replied, "When the apples came, about 20 years ago. But in small villages far away, it still happens like this" (Interview, September 2012).

At the village level, interviewees expressed that through different social networks they volunteered time and labor to construct and maintain irrigation channels, village foot paths, and harvest *chilgoza* pine nuts. These mutual exchange arrangements provided efficient labor for village affairs and created a tight-knit village community that relied on these networks of social relations. Another reason for a shared labor practice was management of herd animals. Interviewees discussed pooling their animals together to collectively graze the herd. Additionally, relationships were made based on economic networks with other villages. While migrating between their summer and winter pasturelands, shepherds transported goods to remote villages for money or trade (Singh, 2012). Kinnaur's diverse production system including agro-pastoralism and trade, served as "a single economic unit" (Singh, 2012, p. 171) that necessitated networks of social organization within the households, the larger village, and broader region.

[97] The Kinnauri cap, which is worn by almost all men and women, represents Kinnauri identity. During different festivities such as weddings the cap is gifted to the guests. Caps are generally decorated with various ornaments including flowers.

Participation in groups and varying social networks provided a social safety net and protected people against shocks and environmental calamities. Reciprocal relationships "are the basic strands of the social fabric and security within the villages; they create a web of interdependencies and make communities resilient to perturbations" (Berkes et al., 1996, p. 20). Habtoma and Ruys (2007) found that in traditional Eritrean societies, people use their local social capital or their networks, to compensate for lack of formal safety nets and to reduce their unforeseen social costs. Non-market social interactions hold significance in "individual and collective behavior and in shaping economic and social outcomes" (Habtom & Ruys, 2007, p. 219) . Similarly in Kinnaur, arrangements of risk-sharing were maintained through social structures and provided social safety nets in times of need, be it on the household or broader regional level.

Interview questions on cooperative labor revealed similar results as the following passage from an oral history with an elder:

> The olden days were a very beautiful time compared to today. Everyone engaged with one-another and our society was stronger and closer. When someone had any kind of work, everyone would come to help. People helped each other. Now this system no longer exists. Now everyone has money and people hire outside labor. Due to this, everyone is parting from each other and relationships are changing. There is now more distance between people (Interview, September 2012).

Because networks create cooperation between people vertically and horizontally across socio-economic boundaries for a shared gain, they produce a foundation for social cohesion (Field, 2003; Putnam, 2000). As networks weaken and alter social relations, social safety nets too disintegrate leading to the dissolution of cohesion within the community. In Kinnaur, social arrangements and social networks that have been in place for generations are evolving and therefore initiating a decline in the practice of cooperative labor. Swift (1993) has argued that market integration in general weakens social insurance mechanisms that are touted in relations of reciprocity and exchange. Markets shift traditional production systems by commoditizing resources and labor and separating economic relations from social relations (Swift, 1993). Market transactions are dominated by contractual relationships, which deteriorate personal relationships such those based on kinship that exist in pre-market societies (Kornblum & Smith, 1994; Parsons, 1991). The participant responses and participant observation recorded in this research suggest that Swift's predictions are being realized in Kinnaur.

The decline of networks of cooperative labor in Kinnaur began at the beginning of the post-independence era, with the many factors already discussed: greater connectivity with the larger Indian polity, the initiation of land reform regimes, and the increasing opportunity for Kinnauris as laborers**.** One of the early significant changes in Kinnaur was the introduction of wage labor, which was initiated in the early 1960s with the construction of the national highway. Later in the 1970s, landless Kinnauris earned cash by working in the orchards of first adopters of the apple economy. With access to wage labor, the need to depend on others for support began to diminish. I heard similar accounts as the following interviewee, "Earlier there was a lot of cooperation, a lot of understanding which is gradually disappearing. The material life that you see in America, is coming here now. Earlier there was a lot of cohesion; we had a social networking system" (Interview, September 2012).

Today, smaller family units are not as willing to spare the time of their members to participate in cooperative labor. Further, Kinnauris have little time to devote to laboring for

others, and, although reciprocal exchange systems should provide some recompense, they do place demands on the time of participants. Additionally, the overall need for cooperative labor has shifted as livelihoods have evolved from agro-pastoralism, a production system that is unfeasible without cooperative labor, to monoculture apple plantations. Their new market-based system of production still requires labor, but as interviews conveyed, today Kinnauris have access to cash providing them the ability to hire seasonal laborers to assist with their orchards. Matters relating to the broader village are increasingly being assumed by village *panchayats*[98] using funds allocated by the state government.

Not all forms of cooperative labor have vanished, however. I observed cooperative labor practices in pea cultivation in some villages in Upper Kinnaur, where a higher prevalence of polyandry exists. According to participants, this work is chiefly done by a small number of women who belong to the same extended family or live in close proximity (See Figure 8). And some villages, again, in Upper Kinnaur, still participate in the traditional cooperative harvesting of *chilgoza* pine nuts, which I will further discuss below. Additionally, as was expressed by participants, a system of social contract is still maintained in the form of catering to the village temples. In the village of Kalpa for example, one person from every upper caste household, must provide his or her time on an annual basis for the affairs of the village temple where the Deity resides. Moreover, the Kalpa Deity is the official owner of an apple orchard in the middle of the village, which is also considered sacred land. Every year one member from each household in Kalpa volunteers his/her time and labor to maintain the orchard. According to participants, upon sale of the harvested apples, part of the profit is deposited into the bank account of the local Deity, which is maintained by the temple, while the other part is distributed amongst the Kalpa households. If a household refuses to participate, it will be deprived of its share of the profits. Generally, households partake in this work as it is considered paid labor and they receive a portion of the profits at the end.

**Figure 8: Women of kin in Ropa Valley, Upper Kinnaur, weeding a small cropped field. Photo by Author, May 2013.**

Interviews revealed that the decline in cooperative labor has been one factor tied to weakening of community solidarity and cohesion, and it is gradually leading to individual

[98] The smallest official institution of self-governance in India. The members of the *panchayat* are elected every four years

behavior and decision-making. The repercussions of declining cooperative labor can be witnessed both at the level of the household and the village where occasions for engagement and involvement[99] are gradually abating and evolving. For example, without the cooperative labor system to help with construction, people no longer participate in the ritualistic celebrations that once marked the completion of their efforts. Building construction is now invariably done by outside laborers, most of whom come from the Indian state of Bihar. On a broader village level too, networks and informal village institutions that once managed and arranged cooperative labor for a variety of village affairs have been replaced with formal institutions. Village development activities such as repair and maintenance of irrigation channels and foot paths are now undertaken by formal village institutions such as the *Vikas* Committee (development committee) through the help of hired labor.

Another important area where cooperation has declined is participation in the *gram sabha* meetings. The *gram sabha,* or the people's forum, or village assembly, is a constitutional body enabling each voter to be part of the village decision-making process at the local level (Buch, 2012). Through the *gram sabha* meetings, people are provided a forum to discuss issues pertaining to the village, including problems and needs of the village. Every *gram sabha* holds four general meetings annually in the village. The meeting dates are predetermined and take place on the first Sunday of January, April, July, and October. A member of one-third of the households of the village must be in attendance to form a quorum. Decisions may then be voted upon by the attendees. I attended the last *gram sabha* meeting of the year in October 2012 in the village of Kalpa. The meeting had to be cancelled and rescheduled as a quorum was not reached. The next meeting was scheduled for two weeks later, and despite the presence of enough people to make a quorum, it was adjourned. I was informed later by several people that household members had only attended the meeting to sign their names after which they had left. The *gram sabha* makes decisions on any number of issues pertaining to the village including the approval of plans, programs, and budget for economic development projects, authorization of funds for the implementation of projects, and review of financial statements pertaining to the village. These are important issues that affect village residents. However, interviewees expressed that due to lack of time they may not participate in these meetings.

Not everyone yearns for cooperative labor practices however. Woman interviewees, for example, expressed that their lives have become easier and less laborious. In addition to providing their labor to others, during cooperative labor activities, generally it was the responsibility of the woman of the household to feed those who had come to provide their labor. The women therefore worked all the time. One woman's comment, representative of what I commonly heard was "Before, there was much more work, especially for women. We used to do cooperative work for the community. But now we have money to hire the Nepalis to do work in the fields" (Interview, September, 2012).

## *Thriving Migrant Labor Economy and Reconfiguration of Local Labor*

> "These days, the young generation is embarrassed to work in the fields. Fifteen years ago, more and more Nepali laborers were coming here and so people started to hire them. Also, when someone made a lot of money, they would boast about their wealth by hiring laborers to work for them in their fields." (Interview, April, 2013)

[99] Kinnauris still have plenty of religious and cultural celebrations and festivals.

As more Kinnauris become part of the middle class with access to capital, they are better equipped to hire outside labor for laborious work that was once done through social arrangements such as cooperative labor and polyandry. Additionally, the younger generation's indifference and dislike toward orchard work, and the shift in the role of Kinnauri women from laboring to now mainly supervising the orchards, has allowed for the emergence of a thriving migrant labor wage economy.

**Figure 9: Migrant laborers, Ribba Village**

Nepali migrant laborers carrying apple boxes to the road. Each box weighs 20 kilograms (44.1 pounds).
Photo by Author, September 2011

During my fieldwork, I commonly heard sentiments similar to these: "Because people are now earning money, they can pay laborers to do the orchard work. Laborers do all the work these days and people themselves are working less in the field" (Interview, November 2012). Laborers are involved in an array of projects including clearing and breaking down many hundreds of stones of varying sizes from the land, which are used in an elaborate manner to develop terraced fields built into the side of the mountain. Laborers also carry sack loads of fertilizer and spray equipment, harvest and carry heavy boxes up and down treacherous and steep mountain trails to the nearest road. In general, interviews conveyed that Kinnauris as a whole are spending less time in their own orchards. This leads to loss of knowledge regarding the orchards and their management, as participants provided common responses such as: "The laborers are working more directly in the fields and we spend less time in our orchards. If an orchard owner is less involved, then obviously that orchard will be lacking as the laborers are only working for money" (Interview, November 2012).

## *Irrigation*

Another important area of networks of cooperative labor was in management and maintenance of the traditional irrigation channels serving as a common pool resource. Most villages irrigate their orchards through a system of *kuhls*, or irrigation channels, which are controlled by the force of gravity and are fed by melting glaciers or small rivulets. Traditionally, every household participated in making decisions about water related affairs and was mandated to provide voluntary labor to maintain the village *kuhls*. Today however, as people have become busy with their orchards, their involvement and participation in matters related to the village such as the *kuhls* has diminished.

Due to increasing demand on water resources, population growth, and lack of collective participation, formally instituted village committees have replaced informal village institutions and networks. In the village of Kalpa for example, annually elected *Vikas* or *Nahar* Committees

(Development or Irrigation Committees) are in charge of upholding rules related to distribution of water and maintenance of the *kuhls*. Cooperative labor has been replaced with hired migrant laborers with funding allocated by the village *panchayats* to maintain the *kuhls*. These committees also resolve water related conflicts such as water theft, which, if caught, results in heavy fines. Formal village water distribution arrangements were instituted in the early 1980s for the whole of Kinnaur. Since then, the population has increased and so have apple orchards, placing increased demand on water use. Additional complications to village irrigation schedules is created as family landholdings are continuously being divided between male siblings.

## *Chilgoza* Pine Nuts

In addition to the *kuhls*, discussed above, the *chilgoza* pine nuts[100] are another significant common pool resource for the Kinnauris that relied on common labor practices in its collection and distribution. My findings suggest that as apples take prominence in the Kinnauri economy, the *chilgoza* pine nut and its collective harvesting system are losing importance. I will briefly discuss the traditional collaborative harvest of the *chilgoza* pine nuts prior to investigating specific causes of change that are currently leading to its decline. I will then discuss the implications of these changes for the future of this resource.

**Figure 10: A Kinnauri woman cracking open the *chilgoza* pine cones, Middle Kinnaur**
Photo by author, October 2012

*Pinus gerardiana*, or *chilgoza* or *neoza*[101], is a native pine tree that is confined to small pockets in Western Himalaya including in the Satluj Valley in Kinnaur, eastern Afghanistan, and parts of mountainous regions of northern Pakistan (Malik, Shamet, & Butola, 2012) and small pockets in China (Tibet) (Farjon, 2013). This robust tree can survive in little soil and in extreme cold and drought condition at an altitudinal range of between 1500 to 3300 meters, situated in the dry temperate zone of Kinnaur (Malik et al., 2012). Prior to the cash economy in Kinnaur, *chilgoza* pine nuts were of utmost importance to the people of this region. Today, however, these forests are on the decline.

*Chilgoza* trees have historically had ecological, economic, and social significance in the district (Kumar, Shamet, Pandey, et al., 2016). The trees preserve the ecology of hilly regions by

[100] Pine nuts are actually seeds and not nuts.
[101] The word *chilgoza* in Persian/Afghan means 40 nuts in one cone. The local Kinnaur term for the tree is *neoza*, though both *chilgoza* and *neoza* are used interchangeably in Kinnaur. I will refer to the tree and pine nuts as *chilgoza* is the term most commonly used in the literature.

preventing large-scale soil erosion that is common to the Himalaya. Economically, before the prevalence of cash, the *chilgoza* pine nuts were an important trade commodity and a major part of the Kinnauri barter system, and still today provide a supplementary source of income, though the pine nut is losing importance compared to apples.

> In those days we walked for seven days to Rampur to trade *chilgoza* for rice. Big landlords went on horses and mules, but most people walked. If we had a lot of *chilgoza*, then the *chilgoza* would have to be carried on the backs of mules and Dzos. Now look at us, we are making so much money from the apples (Interview, April 2013).

*Chilgoza* pine nuts are also significant socio-culturally. Pine nuts are used as beads that are strung into long necklaces that are placed around people's necks as offerings during different ceremonies. *Chilgoza* is also known for its nutritional and medicinal values and it was a considerable source of fat, carbohydrates, proteins and dietary fibers, especially during long harsh winter months (Malik et al., 2012).

> About 25-30 years back, *chilgoza* was a big part of our diet. People kept the *chilgoza* for themselves, but it was also traded for sugar and rice. *Chilgoza* was also used for its oil. In those days we did not have other strong food stuff to eat, so *chilgoza* was a big part of our diet. That's why people who were born 60 years back are much stronger than we are today (Interview, September 2012).

## *Chilgoza Harvest*

Traditionally, *chilgoza* pine nuts were collectively harvested by each village. Informal management structures provided rules that upheld harvesting methods, distribution, and regeneration and overall sustainability of *chilgoza* pine nuts. Each village has access and usufruct rights to its own common *chilgoza* forest, all of which are also under the management of the Himachal Pradesh Forest Department. There are also *chilgoza* trees on private lands and orchards, the harvesting of which is done by the private landowner. *Chilgoza* harvest is done both at the village and household levels.

At the village level, traditionally, the villagers jointly made decisions about how to collect and distribute *chilgoza* for that specific harvesting season. During harvest, pine cone maturity can be classified in three different stages, old open cones from the previous year, cones fully ripe for harvest, and smaller closed cones that require another year to fully ripen. Traditionally, only the ripe cones were harvested, leaving the smaller younger cones for the following year's harvest as well as for regeneration of the trees. A male and a female member of each household of a particular village would be selected for collective harvesting. The men climbed the trees and plucked the ripe cones, while the women collected the fallen cones on the ground. All members of the village would then receive an equal share of the pine nuts. Alternatively, at the household level, people harvested their own private pine nuts through their networks of collaborative labor.

Today's harvesting methods have been substantially altered, contributing to the demise of many trees. In most villages, communal harvesting has been replaced by commercial contractors who hire unskilled migrant laborers. Most villages now auction the harvest of their communal *chilgoza* forest and accept the lowest bidding contractor to carry out the process. Contractors, most of whom are local Kinnauris, compete by bidding for the harvest of a particular common

forest. Once their bid is accepted, the contractors hire migrant Nepali laborers to conduct the actual harvest. With respect to contracting the harvest, one 35 year-old man who has been involved with *chilgoza* harvest since he was 12 years old, said, "During my father's time, all the neighbors and relatives harvested together. But this all changed to laborers. Now people have sufficient money from apples and don't want to do hard work that they think should be done by the laborers" (Interview, April 2013). Interviewees who discussed *chilgoza* all offered similar accounts regarding people's lack of interest in participating in the harvest. At the household level, in general, people either hire contractors, or directly hire laborers to complete the harvest, although in some villages large households with numerous family members who are able to help, still conduct the harvest on their own.

Another *chilgoza* contractor maintained, "These days I hire the Nepalis because local people have less time, they are busy with their own apple orchards. Also, local Kinnauris work less, but the laborers work much harder, perhaps twice as hard as the locals" (Interview, September 2012). Because the laborers' main interest is to harvest the maximum number of cones in the shortest amount of time, it may appear that laborers are working harder than the Kinnauris would. Rather than only plucking the mature cones, as done traditionally, the laborers cut whole branches and thus terminate every existing cone on the branch, including the undeveloped cones that should be left for the following year's harvest, or the regeneration of the tree.

When discussing *chilgoza*, Kinnauris praised the resource and its many positive properties. *Chilgoza* is generally referred to as "God's gift" to Kinnaur, an important resource that does not require any input whatever. "*Chilgoza* is god's gift because it needs a special climate for production, which we have in Kinnaur. We don't need to put any work into the *chilgoza*, the way we have to do with apples, we only harvest this gift" (Interview, September 2012). This is a common understanding amongst Kinnauris. Although Kinnauris identify with *chilgoza* and participants lamented its decline, there is lack of engagement in its protection. People with whom I spoke expressed their distress regarding the current harmful harvesting practices of *chilgoza* pine nuts. However, when I inquired about the lack of proper harvest training for the laborers, I received similar responses from participants as this excerpt from one contractor showing indifference to its preservation. It would be presumed that this contractor and others like him have some control over the work practices of the laborers they hire. Yet he expressed no sense that he could alter the work practices of his laborers: "The laborers are advised on correct harvesting methods in the beginning. We show them exactly what to do, but they don't listen. After we leave, there is no one to monitor them. So they cut big branches causing production decline" (Interview, April 2013). As several participants revealed that some *chilgoza* contractors actually profit from the large branches that are cut by the laborers, there may be an explanation for such a lack of interest in supervising the hired workers. Large branches are sold as fuelwood, and thus, short-term profit takes precedence over the long-term health of this local native species.

## *Chilgoza Decline*

In 1973, it was estimated by Singh et al., that the *chilgoza* forests of Himachal Pradesh most of which are located in Kinnaur, had declined about 2000 hectares (Singh, Khanduri, & Lal, 1973). In 1993, Kinnaur had a total area of about 3,278 hectares under *chilgoza* forest (Sharma & Minhas, 1993), which had reduced to about 2040 hectares by 2011 (Sharma, Sehgal, & Raj, 2010). Although the range of the *chilgoza* forest is widespread, they are small and low in

density (Farjon, 2013). In 1998, the *chilgoza* forests were placed on the IUCN (World Conservation Union) Red List of Threatened species under the category of Lower Risk/Near Threatened. However, by 2013, *chilgoza* forests were reclassified as "Near Threatened" (Farjon, 2013).

In addition to careless harvesting practices, there are other reasons contributing to the decline of the *chilgoza* species in Kinnaur. The rise of the apple economy has diverted interest from *chilgoza*, placing this resource secondary in importance to apples. Despite the high prices fetched for *chilgoza*[102] that serve as an important supplementary source of income, apples still take prominence. Market integration has therefore "made the management and usage (over-exploitation) of CPRs [common pool resources] highly demand driven" (Jodha, 2007, p. 1). Because of the overall rural transformations, common resources such as the *chilgoza* pine nuts, are now inferior in the rural economy (Jodha, 1995).

During an oral history interview when I asked a 93 year-old elder, who has passed away since the interview, whether there was a connection between the apple economy and declining *chilgoza* production, he animatedly exclaimed, "Of course there is a connection. C*hilgoza* is decreasing because of the apple trees. Many people are cutting their *chilgoza* trees on their property to replace them with apple trees" (Interview, April 2013). Participants invariably discussed gradually replacing the *chilgoza* trees on their private property with apple orchards. The same young polyandrous couple I mentioned in an earlier section of this chapter, revealed that they once owned about 60-70 *chilgoza* trees on their property producing about 60-80 kilos of pine nuts annually. Today, about 40-45 of the trees are still remaining, providing the family with 25-30 kilos of pine nuts. The family cut down about 20-30 *chilgoza* trees to open the forest for an apple plantation. Additionally, every year the family cuts down *chilgoza* branches to create open areas for the apple trees to receive sufficient amount of sunlight.

As noted above, poor harvesting practices by laborers are contributing to a decline in cone regeneration and overall tree damage. Because every cone is collected, there is little likelihood for natural regeneration of the tree. The only chance for regeneration is on steep rocky cliff sides where collection is dangerous. But there too, the seeds have to be extremely carefully protected in order to survive animals and birds. Further, there is unregulated and unrestricted grazing in these forests, which deter regeneration of the cones that have not been harvested (Kumar, Shamet, Sharma, et al., 2016). Development and the increase in the number of roads in Kinnaur have created accessibility to areas that may have been difficult to reach and therefore were more protected from overharvesting. And finally, climate change is another contributing factor to the damage of these trees that were adapted to very specific climactic conditions that are now changing (Kumar, Shamet, Pandey, et al., 2016). When discussing the effect of climate change on the chilgoza trees, participants claimed that the changing weather patterns are causing damage to the trees. "Before, we harvested 100 kilos plus, but last several years we are harvesting 60-70 kilos. Now we have less snow and more rain, otherwise, there is no need to give the chilgoza trees anything; this is what nature gives us" (Interview, April 2013).

[102] Today, a kilo of *chilgoza* pine nuts sells for about 1000 Rupees, while a 20-25 kilo box of apples sells for between 1000-1500 Rupees, depending on the quality of the fruit and market prices.

The successful operation of common pool resources such as the *chilgoza* pine nuts is based on their management networks and institutions. Institutional failure to control access to resources and to enforce rules results in the disruption or failure of the common resources. Failure can be due to both internal reasons including the failure of the users to manage the system, or external reasons such as market incursions providing new prospects (Berkes & Folke, 1998). In the case of the *chilgoza* pine forests of Kinnaur, field observations suggest that both internal and external reasons have been contributing to the decline of this common pool resource. Informal village-level institutions and social networks have been replaced with formal committees that manage the harvest of *chilgoza* by contracting and hiring outside laborers. Additionally, with market penetration and apples taking precedence as a cash crop, there is a disinterest amongst Kinnauris to collectively and sustainably harvest *chilgoza*, as it was done traditionally.

**Figure 11: Women on a rooftop collectively separating the seeds of the *chilgoza* from the cones, Upper Kinnaur**

Photo by author, April 2013

## Chapter Conclusion

Kinnaur has been undergoing complex and dynamic change since India's independence. In this chapter, I have examined the social ramifications of changes and their implications for the future of sustainability in Kinnaur. The three examples I have examined in this chapter—fraternal polyandry, social networks of cooperative labor, and the *chilgoza* pine nuts—illustrate Kinnaur's social transitions in light of broader environmental and economic change. My observations suggest that market integration is linked to declining networks of social exchange and reciprocity. Social networks were traditionally important components of the Kinnauri livelihood system and risk management strategy. Social relations that existed based on people's

participation in different horizontal and vertical networks provided safety nets in times of stress or shock. Although people still rely on their social networks, especially of their extended family, cooperation and reciprocity as a whole has weakened. The weakening of these networks of exchange may increase the vulnerability of Kinnauris in times of environmental risks and market fluctuations.

The introduction of the monetized economy has provided Kinnauris with social goods such as access to education, healthcare, physical mobility, and participation as active agents in the broader market economy. As their standard of living has improved, Kinnauris have altered their traditional adaptive practices that were once necessary for survival in severe mountain conditions. Historically Kinnauri survival has been rooted in their diversified livelihood system and their capacity to adapt to change and disturbance by employing diverse strategies that depended on cooperation and social exchange. Whether new practices are similarly successful and adaptive in the long run remains to be seen. Weakening of social networks and increasing dependence on a few sources of livelihood may not harm Kinnaur in the short term, but could pose longer-term risks in the form of increased conflict or reduced resilience in the face of unexpected social, ecological, or economic disruptions.

Kinnaur is currently experiencing a "golden era" of its apple economy and prospering in an unprecedented manner. It is unclear, however, how long this state of prosperity will persist, especially with noticeable climatic changes. While my research provides preliminary insight into Kinnaur and its livelihood and social transitions, there are a number of questions that remain to be addressed through further research. Will Kinnauris be able to continue adapting to other forms of livelihood activities when and if apple production is no longer viable? Will the Kinnauri system and change be sustainable? Will Kinnauris devise new adaptive strategies that incorporate traditional practices with its modern processes?

# Chapter Five: Conclusion

## Constraints and Opportunities, Prosperity and Vulnerability

Rural areas in the Indian Himalaya have been experiencing rapid integration with the Indian market economy since the 1990s, building on state-led initiatives that started with Indian independence (Mehta, 2010). This study of Kinnaur is intended to provide insight into the character and ramifications of this process. Changes similar to those taking place in Kinnaur are affecting many agro-pastoralist communities throughout the Indian Himalaya, as well as in neighboring Nepal and Tibet. While Nepal and Tibet have received significant attention from scholars, Kinnaur has so far received very little interest from the academic community.

The central aim of this dissertation has been to give voice to the story of Kinnaur and the district's transformation since India's Independence in 1947. Employing an ethnographic approach rooted in a political ecology framework, I have broadly argued that the Kinnauri transition from traditional subsistence and barter to an apple-based market economy has been significantly influenced by outside forces. Following in the footsteps of political ecologists such as Blaikie (1985), and Blaikie and Brookfield (1987), I investigated the repercussions of larger socio-economic and political processes on Kinnauri social structures, livelihood strategies, resource use and management, and identity. I have provided an analysis of the complexities of socio-ecological changes and their implications in the context of a wider economic transition in this Himalayan area. State-led interventions, market integration, Kinnaur's geopolitical position, and climate change, have propelled this once isolated region into what I call Kinnaur's Golden Era, creating a temporary landscape of opportunity.

The desire to tackle poverty in what politicians of the post-Independence era referred to as a "backward" mountain region was the impetus for state interventions that began Kinnaur's journey in its contemporary history (Vedwan, 2001). State-led policies of land reform and promotion of commercial horticulture have brought economic prosperity to Kinnaur, a place that until the 1960s and 70s had little experience with currency. I have shown how post-Independence land reform has significantly reduced the number of landless and improved the socio-economic condition of Kinnauri people. My hope is that Kinnauris will benefit from my documentation, for the first time, of the consequences of land reform in Kinnaur and related issues.

My work has examined the implications of rapid transformation in Kinnaur, and could generate insights into how mountain regions in general might successfully adapt to change. Kinnauris' relationship with their environment has been continuously evolving. They have shaped their landscape to fulfill their needs through their use of resources, management practices, and livelihood strategies. Kinnauri social structure and cultural practices have adapted in parallel with these changes. Following the framework of mountain specificities introduced by Jodha (Jodha, 1997), I have provided an examination of Kinnauri adaptation to environmental and economic niches. These adaptation strategies have evolved as the agrarian system promoted by the state has taken hold and expanded, and as the Kinnauri environment has changed.

Subsistence-based livelihood strategies such as pastoralism and cultivation of traditional crops have been replaced with a cash economy dominated by commercial monoculture apple production. The Kinnauri apple economy gives the strong impression of an opportunistic "gold rush": while apple prices are strong, landowners race to plant apples on every available piece of

land – forgoing other crops, clearing native forest, even planting in unstable gullies. Limited arable land, the lure of profit, and lax enforcement of forest protections have resulted in illegal encroachment on nominally-protected land. The limits of the current landscape of opportunity are unknown, but environmental stresses have appeared and there are obvious risks to such extensive dependence on a single cash crop. Pests and diseases are an increasing problem, especially in lower-elevation older orchards. Orchards planted in steep upland areas may soon deplete soil productivity. Climate change can alter conditions to disfavor apple production, as appears to be happening at lower elevations. Intense weather events can wipe out orchards or destroy a crop. Kinnauris face market risk as well, as apple production in other areas expands, and apple importation from other countries increases. New adaptive strategies will be necessary to face these changes. The landscape of opportunity and prosperity will be temporary if Kinnaur continues with its extreme dependence on monoculture apple production.

This study sheds light on the consequences of climate change on local subsistence systems. I take a different stance from many climate change scholars observing that in Kinnaur, climate change, in combination with other processes, has provided Kinnauris with a temporary landscape of opportunity. Kinnaur's shift from a diversified subsistence livelihood to a dependence on apple monoculture has contributed to the district's success. Future success, however, will likely depend on the ability to proactively evolve while times are good. This moment of prosperity – Kinnaur's "Golden Era" – may be a critical moment for Kinnauris to expand their livelihood diversification. Today, Kinnauris have access to capital, technology, and information with which they can develop new livelihood options and better adapt to their changing climate and environment – potentially prolonging their landscape of opportunity.

Amongst the many socio-cultural changes, Kinnauris, especially the youth, are moving away from the traditional practices of fraternal polyandry and the joint family system to monogamy and nuclear families. The declining practice of polyandry is linked to land partition between male siblings leading to smaller landholdings. This motivates some to encroach on high elevation public lands, negatively impacting the environment. Additionally, my research suggests that market integration is shifting and weakening traditional networks of collective action and reciprocity as people no longer need to depend on them for their survival. The weakening of these traditional social networks may increase vulnerability when faced with market fluctuation and climate shocks.

As these events are changing the landscape and the people of the area, Kinnaur serves as an ideal locale to examine dynamics of human-environment interactions and to contribute to a body of knowledge on the sustainability of mountain livelihoods in light of market transitions. I hope that this work will add to South Asian political ecology and mountain studies by providing important practical and applied data.

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