Prospective Forests and Farmers’ Perspectives: 
The Politics of Rubber Trees and Ecological Restoration 
in Southwest China

by

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Thesis Submitted in Partial Fulfillment of
the Requirements for the Degree of

Master of Arts

in the
Department of Geography
Faculty of Environment

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SIMON FRASER UNIVERSITY
Fall 2012

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ABSTRACT

Extensive forest cover change has increased scientific and governmental attention to ecological restoration globally. However, restoration plans often neglect local stakeholders and the multi-scalar politics in which they are entwined, thereby jeopardizing social and ecological conditions. These pitfalls point to the utility of political ecology for recasting restoration ecology with a focus on power relations and bottom-up analyses. This thesis examines prospective ecological restoration in southwest China where monoculture rubber cultivation in Xishuangbanna has led to alarming ecological changes. Scientists and the prefecture government are planning “environmentally-friendly rubber plantations,” but ethnic minority farmers’ viewpoints have been disregarded. This study uses ethnographic and participatory mapping methods to gain farmers’ perspectives on land use and restoration plans. A political ecology analysis reveals significant obstacles, and possibilities, for restoration in Xishuangbanna. In putting forward an approach called political restoration ecology, this study also contributes to advancing the field of restoration ecology.

**Keywords:** China; Xishuangbanna; rubber; ethnic minority farmers; political ecology; restoration ecology; political restoration ecology
For everyone’s remembrance of their innate magnificence, boundless potential, and unity with all
ACKNOWLEDGEMENTS

I am profoundly grateful for all my teachers who are formative in the foundation of this journey: Siddhattha Gotama, Sakyong Mipham, Tim Sandstrom, Dr. Paula Clarke and Ted Hamilton, and Tony Rossi. Likewise, my committee here at SFU has provided immense support. My sincere thanks to: John Ng for the cartographic assistance, Dr. Michael Hathaway for all the insights on Xishuangbanna, Dr. Alex Clapp for the wide range of cross-disciplinary advice, and most of all to Dr. Janet Sturgeon for the tremendous amount of guidance and inspiration.

My beloved family has been fundamental to this project and they deserve my utmost honour and gratitude. Their constant encouragement and compassion is beyond description. I am equally indebted to Ian Bailey and Sara Keene for the decade of inspiration, and to Elysia Brunet for the mountain of loving-kindness.

Finally, this project could not have been possible without the many families in China who have hosted me and taught me more about this world than I could have ever imagined, especially Mrs. Deng and Mr. Li in Beijing and the numerous households in Yunnan. To all my relations, I thank you from the depths of my heart.
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1: INTRODUCTION

Extensive forest cover change has called increasing scientific and governmental attention to ecological restoration globally. In southwest China’s Xishuangbanna Prefecture (see Figure 1.1), the ecological effects of monoculture rubber plantations have recently attracted the government’s concern and led scientists to call for the restoration of natural forests in certain geographic zones. In 2009, the director of the Xishuangbanna Tropical Botanical Garden (XTBG) proposed a plan for the Prefecture to establish ‘environmentally-friendly rubber plantations’ (huanjiing youhaoxing jiaoyuan). The restoration plan called for reforested corridors connecting the nature reserves within the Prefecture; reforestation of 20 per cent of the area currently planted with rubber trees in the Prefecture into natural forests through converting roadsides, ridge tops and ravines; and planting cash crops such as tea, coffee, or medicinal plants in the understory of some rubber trees to increase ground cover and help compensate farmers.

Research on rubber’s effects in Xishuangbanna describes decreased biodiversity, altered weather patterns, and increased soil erosion (Wu et al. 2001). However, rubber has transformed farmers’ lifestyles and is their primary source of income. The restoration plan comes after decades of state agents encouraging local ethnic minority farmers to grow rubber for economic development. Indeed, the region’s economy has become enmeshed in global
markets, modern infrastructures have linked remote communities, and household incomes have increased dramatically (Liu et al 2006). Focussing first on Xishuangbanna and then on the field of restoration ecology as a whole, this thesis explores how restoration is embedded in socio-cultural and political-economic dimensions, and how restoration ecology can be more effective by addressing these dimensions in analyses and projects.

Figure 1.1 Location of Xishuangbanna

Xishuangbanna is located in southern Yunnan Province on the border of Burma and Laos and is often considered to be part of Montane Mainland Southeast Asia. The terrain varies from mountains over 2000 meters above sea level (masl) to rivers at about 500 masl in the valley bottoms. The main forest
types include tropical seasonal rain forest, tropical mountain rain forest, evergreen broad-leaf forest, and monsoon forest (Li et al. 2008). The area has China’s highest biodiversity (Cao and Zhang 1997), and is part of the Indo-Burma biodiversity hotspot (Meyers et al. 2000).

The region was historically known as Sipsongpanna, an independent Tai principality that paid tribute to both Burma and China (Sturgeon 2005a). It was incorporated into the People’s Republic of China after 1949 as the Xishuangbanna Dai Autonomous Prefecture. The Prefecture is home to 13 of China’s 55 ethnic minority nationalities (Xu 2006). The majority of people are Dai, who live in the lowlands and are known for their wet rice cultivation. Other groups such as the Akha¹ and Jinuo live in the uplands and are known for their swidden agriculture. However, the region’s customary land use practices have undergone significant changes as a result of state policies and rubber cultivation.

A brief history of rubber in Xishuangbanna highlights some of the political complexities underlying the restoration plan. Rubber cultivation in China began in the 1950s due to a trade embargo on rubber and other strategic supplies during the Korean War (Chapman 1991). The central government chose tropical Xishuangbanna as a region for rubber cultivation, and moved thousands of Han Chinese there to establish large state rubber farms (Sturgeon 2005a). However, ethnic minorities were excluded from rubber cultivation until the early 1980s after China’s Reform and Opening policies dismantled communes and allocated the land to individual households (Sturgeon and Menzies 2006). At that time, state

¹ The Akha are subsumed in the Hani minority nationality in China.
agents began encouraging farmers to plant rubber on their household plots for economic development. In the 1990s, state farms ceased expanding in size, but state agents continued to promote rubber to the farmers as a form of poverty alleviation. Under reforestation campaigns in the 2000s, rubber trees were promoted as a form of forest cover (ibid.). Rubber is now the dominant land use below 700 masl in Xishuangbanna. Although minority farmers have succeeded on the state’s economic development terms, they are still viewed as “backward” by officials and their land management is considered “unscientific” and “chaotic” (ibid.). Such viewpoints overlook farmers’ knowledge of their landscapes and the ecological changes that have occurred through time.

In this thesis, I argue that local knowledge is crucial both to the restoration project, and to the science and practice of restoration ecology. I sought to understand such knowledge through the following research questions. First, how has the introduction and expansion of rubber cultivation altered environmental concerns among ethnic minority rubber farmers? To what extent do these concerns differ across generations and genders? Second, what individual, cultural, and socio-political factors affect farmers’ perspectives towards restoration, and why? Third, how might past and current property rights arrangements affect restoration? Answering such questions is critical to the restoration ecology project proposed in Xishuangbanna. Understanding the answers to these and similar questions can improve the science and practice of restoration ecology.
This thesis shows that ecological restoration is inseparable from the history and politics of a project and its location, and thus restoration needs to account for these historical and political factors. Using an approach from political ecology, I argue that understanding history and politics should begin with local land users. I examine the restoration plan for Xishuangbanna through the perspectives of ethnic minority farmers: men and women of all ages. I also focus on the multiple scales of politics that affect land use, peasant-state relations, and notions of cultural identity. In particular, I analyze property relations to show how politics play out on these socio-spatial landscapes. China’s post-socialist property transformations are central to land use politics and cultural identities in Xishuangbanna. Indeed, farmers’ perspectives reveal both significant obstacles and opportunities for the restoration project.

An outline of the thesis is as follows. The next chapter explains my fieldwork process. My main research objectives were to trace historical events and state policies that affect the restoration plan, to gather farmers’ narratives of socio-ecological changes, and to map out transformations in property relations and land use patterns. To achieve these three research objectives, the fieldwork consisted of semi-structured interviews, participant observation, and participatory mapping.

Chapter three reviews relevant aspects of the six decades of China’s dramatic changes since the foundation of the Peoples’ Republic in 1949, and the important considerations these aspects hold for ecological restoration in
Xishuangbanna. I also review how changes in state-allocated property rights have significantly affected the social and physical landscape of Xishuangbanna.

Chapter four explains the parts of restoration ecology, political ecology, and property relations that I use in this thesis. I show that restoration ecology can be improved by considering politics explicitly, rather than by obscuring it under "social" and "economic" categories. Political ecology presents a conceptual framework and methodological tools for deciphering restoration politics at multiple levels. Property relations provide the lens for tracing the politics through time, space, and changing cultural meanings.

In chapter five I explore the farmers' views on socio-ecological changes resulting from rubber cultivation and other land use changes. I then focus on four cases that illustrate the imbrication of property relations with kinship, identity, village politics, and peasant-state relations, and how these relations affect farmers' environmental concerns, livelihoods, cultural values, and attitudes toward restoration.

Following this discussion, chapter six presents the argument that political ecology can improve the theory and practice of restoration ecology through using bottom-up processes to include local stakeholders, and through emphasizing the central roles that power and history play in understanding ecological changes. I also recast restoration ecology through a political ecology perspective and describe an approach for working towards what I call political restoration ecology.
2: METHODS

This study is based on fieldwork conducted from early June to late August of 2010. The fieldwork took place in 17 villages, a state rubber farm, a state rubber factory, and the Xishuangbanna Tropical Botanical Garden (see Figure 2.1 and Table 2.1). I went to Xishuangbanna to understand ethnic minority farmers’ perspectives on environmental changes and ecological restoration in light of the proposed state restoration plan, and also to see how farmers’ viewpoints could contribute to planning and implementing such projects. I had three main research questions. First, how has the introduction and expansion of rubber cultivation altered environmental concerns among rubber farmers, and to what extent do these environmental concerns differ across generations and genders? Second, what individual, cultural, and socio-political factors affect farmers’ perspectives toward reforestation, and why? And third, how might past and current property rights arrangements affect reforestation considerations?

To address these research questions, my main research objectives were to trace historical events and state policies that affect the restoration plan, to gather farmers’ narratives of socioecological changes, and to map out transformations in property relations and land use patterns. To meet these three research objectives, the fieldwork consisted of semi-structured interviews, participant observation, and participatory mapping. This chapter explains these methods and important parts of the fieldwork process.
Table 2.1 Outline of fieldwork details

<table>
<thead>
<tr>
<th>Number on Map</th>
<th>Location</th>
<th>Minority Nationality</th>
<th>Number of People Interviewed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Baka Xinzhai</td>
<td>Jinuo</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>Man’e</td>
<td>Dai</td>
<td>24</td>
</tr>
<tr>
<td>3</td>
<td>Manlun</td>
<td>Dai</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>Chengzi</td>
<td>Dai</td>
<td>27</td>
</tr>
<tr>
<td>5</td>
<td>Daka Xinzhai</td>
<td>Akha</td>
<td>18</td>
</tr>
<tr>
<td>6</td>
<td>Manzha</td>
<td>Dai</td>
<td>13</td>
</tr>
<tr>
<td>7</td>
<td>Central Menglun</td>
<td>n/a</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>Manbian</td>
<td>Dai</td>
<td>22</td>
</tr>
<tr>
<td>9</td>
<td>Xishuangbanna Tropical Botanic</td>
<td>n/a</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Garden</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Man’an</td>
<td>Dai</td>
<td>17</td>
</tr>
<tr>
<td>11</td>
<td>Mandajiu</td>
<td>Dai</td>
<td>28</td>
</tr>
<tr>
<td>12</td>
<td>Manheguo</td>
<td>Dai</td>
<td>11</td>
</tr>
<tr>
<td>13</td>
<td>Mannadu</td>
<td>Dai</td>
<td>21</td>
</tr>
<tr>
<td>14</td>
<td>Mengxing Sanfenchang state rubber plantation and factory</td>
<td>n/a</td>
<td>11</td>
</tr>
<tr>
<td>15</td>
<td>Mannasan</td>
<td>Dai</td>
<td>28</td>
</tr>
<tr>
<td>16</td>
<td>Mengxing Xinzhai</td>
<td>Dai</td>
<td>16</td>
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<tr>
<td>17</td>
<td>Mandazhou</td>
<td>Dai</td>
<td>13</td>
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<td>18</td>
<td>Guanniu</td>
<td>Ahka</td>
<td>11</td>
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<td>19</td>
<td>Yanuo</td>
<td>Jinuo</td>
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</tr>
<tr>
<td>20</td>
<td>Mengpeng</td>
<td>Dai</td>
<td>7</td>
</tr>
</tbody>
</table>
I studied Mandarin in preparation for this fieldwork through two years of coursework in North America and one year of intensive training at the Academy of Chinese Language Studies in Beijing. As the lingua franca throughout China, Mandarin is common in ethnic minority areas alongside the native languages; however, most people prefer using their mother tongue. In some villages I had local residents translate for farmers unable or hesitant to speak Mandarin. Two other local Dai people translated in several Dai villages: Ai Yan, a staff member at XTBG; and Yi Zhuangfang, a Ph.D. student with the Chinese Academy of Sciences at XTBG. Throughout the summer I also studied basic Dai and Akha phrases, which helped my fieldwork. Outside of villages I conducted the other interviews in Mandarin or English.

I first travelled to Xishuangbanna and Menglun in May of 2009 to reconnoitre potential research sites and establish connections, or what is known in China as guanxi, for starting the fieldwork in 2010. As Gold et al. (2002: 3) explain, “To some observers and practitioners, guanxi is an essential and defining element of Chinese culture, handed down relatively unchanged through time and space. To others, guanxi is little more than a Chinese word for personal networks, social capital, and gift economies found in any society.” An important part of life and research in China, guanxi helps gain access to new groups and important actors.

My experience of guanxi pertains to these personal networks and social capital aspects. The connections I made in 2009 when exploring the area and taking part in my colleague’s field work created good guanxi for 2010. Likewise,
relationships I made throughout the 2010 summer—sometimes in unexpected settings such as a motorcycle shop—provided access to key networks. Nonetheless, most of the time I introduced myself to new informants and villages, which also led to great rapport and results.

I chose research sites based on purposive sampling strategies. Teddlie and Yu (2007:5) describe four categories of purposive sampling. Among these, I used sequential sampling: “selection of units or cases based on their relevance to the research questions, not their representativeness.” I sought villages that would be affected by the restoration plan. Most villages chosen were within 25 kilometres of central Menglun so that I could bicycle to and from them in daylight. Others were accessed by motorcycle, car, or bus. Moreover, three villages outside of Mengla County were selected for their unique projects, location, and history. Guanniu farmers of Hanna Township initiated successful forest restoration, watershed protection, and compensation measures on their own in 1995. Mandazhou is the ancestral village of the original Dai farmers to settle in Menglun Basin. Yanuo of Jinuoshan Township lies within a designated sustainable agro-forestry zone and inside the proposed biodiversity corridor between the Menglun and Mengyang national nature reserves.

I used snowball sampling for selecting informants. Snowball sampling consists of asking informants to suggest people to interview, and selecting subsequent samples from these recommendations. This step is then repeated through successive iterations. For instance, upon arrival in a new location I first would meet with the village head, in respect of local customs, and it would
inevitably become an interview. At the close of the interview, the village head would refer me to other individuals or households. However, I also accessed many other informants by approaching homes and people without any prior reference.

Semi-structured interviews were conducted with individuals at all the research sites and with groups in the villages. This technique was more appropriate for my fieldwork objectives than interviewing with a set questionnaire and closed-ended options. Such methods, as Fife (2005:94) explains, “in a developing country [are] in some ways a replication of the colonial or oppressor/oppressed relationships of the past.” With formulated potential results, the researcher assumes to know the informants and field situation before even starting the fieldwork. Alternatively, semi-structured interviewing involves “asking questions in such a fashion that the person being interviewed has the ‘right’ to interpret the question and take it to a place he or she pleases” (ibid.: 93). For middle generation and older farmers my questions aimed to discover changes in customary practices, resource access patterns, and the effects of state political campaigns throughout the past six decades. These questions helped identify historical events and Mao and Deng era (1950s to the 1990s) state policies that affect perspectives on the restoration plan.

Additionally, the goals of my interviews of all age groups were to capture farmers’ narratives of socioecological changes to find out if there were differences in opinions between generations and genders. Furthermore, threadlines varied between various age cohorts and villages due to their different
circumstances and locations. I conducted single-gender group interviews, with a female interpreter for female groups. Single-gender group interviews showed close similarities in perspectives across genders on rubber and socio-ecological changes, although their references often differed. Whereas women often referred to children, men spoke of children less often and commonly referred to increased alcohol consumption from rubber incomes. Group interviews were also used to gather village histories.

Another component of my fieldwork was participant observation. DeWalt and DeWalt (2002:4) describe participant observations as:

- living in the context for an extended period of time; learning and using the local language and dialect; actively participating in a wide range of daily, routine, and extraordinary activities with people who are full participants in that context; using everyday conversation as an interview technique; informally observing during leisure activities (hanging out); recording observations in field notes...; and using tacit and explicit information in analysis and writing.

In my experience, ‘using everyday conversation as an interview technique’ was a central part of being in the villages. Opportunities consistently arose to discuss villagers’ viewpoints on rubber and the many issues tied to it. Participant observation also involved activities such as staying with families in villages; helping stock fish ponds; participating in volleyball and basketball games; playing with children; and attending village parties. Although it was challenging to adjust to certain social norms in the villages—for example, as a male guest it was often necessary to drink alcohol—spending time in the villages helped participant observation by establishing good rapport. DeWalt and DeWalt (2002: 8) emphasize the importance of participant observation in that “it enhances the
quality of the data obtained during fieldwork, [and] it enhances the quality of the interpretation of data…. [It] is thus both a data collection and an analytic tool.”

The third method of my fieldwork was participatory mapping. This consisted of drawing timelines, maps, and land use transects with farmers at home and in their fields and rubber plots. Adopted from the field of rural development, as Menzies (1998: 117) explains, “these tools are designed to involve informants in preparing graphic representations of time and space (especially with respect to land use) and relating them to village activities and social structures.” The methods are deliberately informal, yet the collaborative process and the graphics themselves elicit a “surprising richness of detail” on categories of land, present land use, distribution of resources, and changes over time (ibid.).

As in Menzies’ case, most farmers were reluctant to draw and preferred that I draw the maps. Other maps were drawn at vistas while informants described landscape features, village reservoirs, waterlines, and the distribution of land tenures. In two villages, we also mapped out such features on topographic maps that I had enlarged and printed. The participatory mapping techniques were beneficial for revealing transformations of landscapes through time, and especially the patchwork of household plots intermixed on the hillsides.

Furthermore, I made land use transects while walking with informants through paddies and rubber plots to record land uses and tenures over a cross-section of land. The transects elicited a wide range of information on themes such as depictions of preceding decades’ land use, seasonal cropping patterns,
details on specific springs and streams, land inheritances, and split-tenure contracts. As such, the participatory mapping complemented the interviews and observations of my fieldwork, laying the basis for the analysis in the chapters to follow.

Lastly, the fieldwork was not devoid of challenges. The summer climate of Xishuangbanna requires adjusting to a wide range of conditions. From high heat and humidity to monsoon downpours on steep and knee-deep muddy roads, such conditions inevitably affected the fieldwork. For instance, farmers sometimes did not want to leave their homes to go mapping because of the heat or rain. At other times, trips to and from remote villages were quite challenging due to the weather combined with road conditions, blown out tires, or jack-knifed trucks blocking both directions. Patience and good footwear are imperative in rural China.

Additionally, sometimes farmers and village heads were initially reserved for fear that I was a media reporter. My translators had informed me that officials had told village heads not to discuss issues such as the drought and villages’ water scarcity with reporters. That I was a foreigner added to their hesitation, since restrictions on foreign reporters in rural China have increased in recent years. However, assuring them I was a student and describing my project always eased these concerns.

Despite the challenges during fieldwork, with this combination of research methods, and aided by my previous experience in other remote areas of western China, I was able to achieve the research objectives.
3: HISTORICAL BACKGROUND

The six decades of China’s dramatic changes since the foundation of the Peoples’ Republic in 1949 hold important considerations for the current ecological restoration prospects in Xishuangbanna. This chapter reviews this background via three periods: the Mao Zedong era of 1949 to 1977; the Deng Xiaoping era of 1978 to 1997; and the post-Deng era from 1998 to 2010. Specific state campaigns and policy shifts mark each of these periods and their transitions. Understanding these events and their enduring effects illuminates the layers of politics that underlie current state-peasant relations in Xishuangbanna.

3.1 1949-1977: the Mao era

In this period I look at three major processes of the Mao era most relevant to my case: classification of minority nationalities; collectivization and state campaigns; and industrialization and scientific agriculture. This division does not imply a chronological sequence; there is temporal overlap in the three parts. As shown below, the three processes set precedents that continue to affect state-peasant politics and farmers’ livelihoods and help elucidate the subsequent decades’ socio-spatial transformations in Xishuangbanna.

Classification of Minority Nationalities

Following the defeat of the Nationalists, known in China as Liberation, the Communist regime aimed to create an advanced socialist nation, where all
people could progress to the level of ‘socialist man’. Accomplishing this goal depended on first identifying and categorizing all of the country’s various ethnic groups. Teams of ethnologists were sent around the country to determine the number of different “nationalities” including the Han. Using the social evolutionary ideology from Stalin, nationalities were then classified at either a primitive, slave, feudal, capitalist, or socialist stage in history. This five-stage model is taught in China’s schools and colleges as fact (Harrell 1995). In total, fifty-five minority nationalities were officially recognized by the state. The placement of minority nationalities on lower stages behind the Han means they are seen today as inferior and commonly referred to in China as luohou, or backwards. Most minorities’ landscapes and land use practices were similarly pegged as backwards in state discourse. These socio-spatial classifications imbue state rhetoric and frame line agency agendas (Sturgeon and Menzies 2006), while also being reproduced by ethnic minorities themselves. Moreover, these state perspectives of minorities also factored into the major political campaigns of the Mao era.

**Collectivization and State Campaigns**

The Land Reform Campaign began after Liberation with the state eliminating landlords and local chieftain systems. In most regions forests were redistributed to households, but in minority nationality border regions of Yunnan forest management was based on local custom (Sturgeon 2005). The process of land and labour collectivization first began in 1955 with the state grouping villages into cooperatives where local forests, agricultural lands, and other means
of production became collectively owned, but with land management decisions still made within the villages. This system changed dramatically in 1958. After Khrushchev declared that the Soviet Union would surpass the United States in production of important products in fifteen years, Mao followed suit and pledged China would surpass Great Britain in the same time period, despite requiring a four-fold increase in the nation’s grain output (Dikotter 2010). As a result, Mao initiated the nation-wide campaign to skyrocket grain production and industrialization, called the Great Leap Forward (1958-60).

The Great Leap Forward is important to my case for the powerful precedent it set for later state campaigns, such as nation-wide enactment, militarized enforcement, intense state propaganda, and citizen mobilization. Mao envisioned that the maximized production in rural areas needed deeper state control of agricultural management. The state therefore created the peoples communes of up to 20,000 people by combining multiple cooperatives into larger units and delegating authority to CCP representatives to control communes’ production and distribution (Dikotter 2010). To further increase grain production, the Great Leap Forward also entailed massive land reclamation drives around the country, including terracing steep mountainsides, filling in wetlands, and redirecting whole river channels (Economy 2002; Shapiro 2001). The campaign’s emphasis on vigorously controlling nature, a focus echoed in later state projects as well, was promoted through state cadres and propaganda that exhorted the transformation of entire landscapes into grain production.
The Great Leap Forward’s communization of households’ and villages’ means of production and the state’s over-zealous production ambitions had severe socio-ecological consequences. These effects are important to my case due to the hardships they left in farmers’ memories that were contrasted to the present stability and well-being. On top of reclamation and infrastructure projects resulting in labour shortages for tending crops, and the government mandating absurd planting schemes that failed, food rations became further limited by grave maldistribution and waste (Dikotter 2010). By 1959, starvation plagued China’s countryside, even as inflated production quotas kept rising. In interviews, Dai elders described severe hardships and starvation in their villages at the time, although deaths were ultimately staved off through obtaining wild foods and begging from other villages. However, other areas in China were not as fortunate. Formerly estimated at between 15 to 35 million deaths, the latest calculations indicate the famine of 1959-1961 may have killed 75 million people (ibid.).

Mao responded to the backlash within Chinese Communist Party (CCP) leadership from the Great Leap Forward’s catastrophe by initiating a second massive national campaign aiming to transform society. Premised on the need to dispel any remaining rightists and the ‘four olds”—old customs, old culture, old habits, and old ideas—the Cultural Revolution of 1966 to 1976 was a means to exhort Mao’s ideology through mass propaganda, forced labour and re-education camps, and ruthless violence. The resulting melee, not least the Red Guards’ reckless bloodshed and destruction, wreaked havoc on the country’s social fabric
and cultural traditions (Dikotter 2010). In Xishuangbanna, the cultural landscape was severely undermined from the massacre of many monks and the destruction of temples and pagodas. Religious practices were forbidden amongst the laity, and mandated sunrise-to-sunset labour was followed by gruelling and often traumatic re-education sessions where farmers were forced to study Party discourse, disavow traditional beliefs, and ridicule peers or be beaten. Elders also recounted the pervasive malnutrition and starvation of the period due in part to grain shortages resulting from large state procurements. Further affecting grain amounts and social relations was the system of grain allocation based on work points awarded for labour. Describing the upland Akha in Mengsong, Sturgeon (2005:149-150) states:

During the Cultural Revolution (1966-76), people found it hard to work during the day, since they had to attend political meetings and criticism/self-criticism sessions every night until midnight. Additionally, whether they worked hard or not, people earned 8 work points every day for being out in the field. Some village leaders today say there were people (always in families other than their own) who did not like the discipline of working for work points. Some people working in upland rice planted very slowly, taking three months to finish…. That there should have been “everyday forms of resistance” to such a stringent and unproductive labor system is unsurprising (see Scott 1985)…. The emphasis was on building a modern China, but not necessarily on feeding it.

The Cultural Revolution ended with Mao’s death in 1976, but it left strong legacies for China’s subsequent decades. Indeed, in both the Great Leap Forward and Cultural Revolution we find roots of the state’s current penchant for large-scale campaigns with powerful top-down control and mass mobilization. Underscoring the importance of these campaigns to my case, the political and ideological mechanisms of the Mao era underlie the state’s campaign mentality.
that has been reproduced in the dramatic changes in forest policy started in the late 1990s (Sturgeon 2007; 2010).

**Industrialization and Scientific Agriculture**

Chairman Mao and the CCP saw progress as dependent on rapid industrialization. Additionally, an American embargo halted imports that were key to industrialization and national defense, such as rubber (Chapman 1991). During the Korean War, state scientists brought in *Hevea brasiliensis* from Thailand, and, after numerous failed attempts, figured out strategies to protect against Xishuangbanna’s cooler winter season by using increased row spacing for lower slopes, avoiding narrow valleys and valley bottoms, and using seedlings instead of budded stumps or grafts (Chapman 1991).

Throughout the Mao era in Xishuangbanna, state rubber farms were established on massive tracts of primary and secondary forests, which in certain areas were forest and agricultural lands expropriated from the ethnic minorities (Grinspoon 1996, Sturgeon 2005b). Viewing the local farmers as backward, ignorant, and lazy, the state brought in Han from outside the prefecture to create and manage the rubber plantations (Sturgeon and Menzies 2006). Sturgeon and Menzies (2006:33) note, “… land clearance and forest removal were celebrated in the 1960s and 1970s as evidence of the triumph of socialist production against hostile nature (Shapiro 2001).” Administrators saw the production of the industrial-scale farms as epitomizing the state’s success in advancing science and national progress. At the same time, however, the separation of state farms
from farmers’ fields also illustrates the deep socio-spatial divides on Xishuangbanna’s landscape (ibid.). The state kept the ethnic minorities separate from the plantations and rubber cultivation for 25 years until the Reform and Opening’s decollectivization and national political economic shifts.

3.2 1978-1997: the Reform and Opening

Following the death of Mao, new state policies under Deng Xiaoping in 1978 dramatically restructured China’s political economy across multiple scales. Ushering in Deng’s vision for ‘socialism with Chinese characteristics’, this restructuring transformed property relations and land use patterns into forms that were still evident in 2010. Called the Reform and Opening, the period jumpstarted the national economy by increasing trade with foreign firms and decollectivizing land under the household responsibility system. Implemented by 1982-1983 in Xishuangbanna, the system granted farmers freehold tenure to former commune agricultural land that was divided into household plots. This shift in state-allocated property rights significantly transformed the social and physical landscape of Xishuangbanna. Sturgeon (2005a: 53-54) illustrates the social effects of these changes on property rights: “In a major reconfiguration of rule, the household became the basic unit of production in what came to be called a socialist market economy. In a reconfiguration of citizenship, farmers who had earlier been labourers for the state became entrepreneurs for the household.” Additionally, forest tenures also changed in the early 1980s under the national policy of linye sanding, or “three clarifications of forestry,” which Sturgeon (2005a: 54), citing Cao and Zhang n.d.: 3, explains as: “clarification of
boundaries among state forests, collective (village) forests, and nature reserves; allocation of freehold forestland to rural households; and identification of the responsibilities, rights, and benefits of farmers and collectives.” In 2010, many farmers expressed the joy they felt upon receiving freehold tenures to fields and forests. At a time when beer was extremely scarce, one Dai farmer described the property rights changes as “…like getting a free beer every day!” Indeed, the property rights changes of the early 1980s are central to the past and present trajectories of smallholder rubber cultivation in Xishuangbanna.

Shortly after households gained freehold tenures in 1983, agricultural extension agents and state farm personnel began encouraging farmers to plant rubber trees on lower elevation shifting cultivation lands (Sturgeon 2005a). Some villages even received free rubber saplings from the agents. However, many farmers were initially hesitant over the high investments required in land, labour, and capital, coupled with the uncertainty of future income. Most of these early rounds of plantings needed perimeter fencing to prevent cattle from eating the saplings. This problem was common in the 1980s, whereas by 2010 very few farmers raised cattle because of rubber’s ubiquity.

Besides the forest plots allocated equitably to households, tracts of village collective forestlands were also contracted to households and individuals throughout the 1980s and into the 1990s. Use rights on village sloping lands were granted to whoever laboured to clear, terrace, and plant the land. Farmers explained these rights followed a principle of *ni zhong duoshao, ni you duoshao*. Roughly translated as “amount you plant, amount you have,” it expresses that
however much land a farmer could plant would then be held by that household. In fact, certain farmers worked much harder than others to secure more land, and this is a significant factor in the difference of incomes in 2010. An important point discussed in the next chapter is the current pride—albeit modest—many farmers have in their rubber plots and socio-economic success, partly stemming from the arduous labour put into the land to be able to grow rubber.

The property rights transformations and newfound entrepreneurialism of the 1980s coincided with the re-emergence of livelihoods and cultural practices that were suppressed during most of the Mao era. For example, minority nationalities could once again hold religious ceremonies and festivals, and freely speak their own languages. The importance of these aspects to my research lies in how farmers spoke highly of these changes and viewed the regained cultural liberties as coupled with economic improvements. Such associations became especially revealing of the meaning farmers place on rubber and its livelihood benefits. Furthermore, many villages in Xishuangbanna during this period saw a wave of constructing new houses with stronger materials, and other major livelihood improvements including more tractors and machinery, a welcome change after the Mao era with one tractor per village. Put simply, farmers’ accounts of the reform period portrayed a sense of awakening in the sociocultural sphere of village life.

By the 1990s, more and more minority farmers were planting rubber under further pressure from the prefectural government and after seeing fellow villagers’ profits from rubber. Planting rubber was especially advantageous
compared to other cash crops promoted by state agents. Despite being successfully grown by households, crops such as pomelos, mangos, and sugar cane experienced erratic markets that created considerable financial vulnerability for farmers. Farmers were partial to rubber cultivation with its market reliability. Moreover, rubber-processing factories were within short distances, providing a stable outlet for regular sales. Additional prefectural campaigns pushed rubber again in the mid 1990s for economic development goals and poverty alleviation (Sturgeon and Menzies 2006), and farmers kept planting rubber and earning higher incomes.

While smallholder rubber continued spreading in the 1990s, state rubber farms had ceased expanding due to land area restraints. These large plantations had reached their property boundaries by the early 1990s, and additional land was unobtainable (Sturgeon and Menzies 2006). The adjacent lands bordering state farms were household lands, village community forests, or units of the system of national nature reserves across the prefecture.

As a result of pressure from Chinese scientists and international networks, the state established protected areas in the 1980s for the prefecture’s remaining large swaths of primary forests. In 1986, England’s Prince Philip, the head of Worldwide Fund for Nature (WWF) International, visited Xishuangbanna and confirmed that intact tropical rainforests still existed in China (Hathaway 2010). The attention from the international spotlight added weight to creating the system of reserves across the prefecture. In the mid 1990s, the nature reserves were
then elevated to national level status, which put nature reserve administration on par with other high state officials in the prefecture (ibid).

This production of protected space, however, was not without costs for nearby villages that lost some of their best forests (Sturgeon 2005b) and de jure access to collecting non-timber forest products in them. By the late 1990s, the exclusionary protected forests and the ideologies supporting them had grown to occupy a powerful position in the political ecological landscape of the prefecture. The contradiction between environmental protection and industrial scale agricultural production came to reflect the conservation-development paradox in the state goals (Sturgeon and Menzies 2006).

### 3.3 1998-2010: Clash between Goals of Economic Development and Environmental Protection

The large-scale flooding on the Yangtze River in 1998 fundamentally transformed the state environmental protection agenda. The floods, China’s worst since 1954, claimed thousands of lives and caused billions of yuan in damages (Blaikie and Muldavin 2004). State leaders saw the severity of the flooding as a result of deforestation and overgrazing in the upper watersheds of the Yangtze River (ibid.). Consequently, the central government initiated major national forest policies that have dramatically altered China’s rural environmental governance. I highlight two programs for their effects in Xishuangbanna on land use, resource access, and farmers’ perspectives on state environmental protection.
After the flooding in 1998, the Natural Forest Protection Plan banned logging in all state, collective, and household natural forests in nine western provinces, and in 2000 the ban was extended to nine more (Blaikie and Muldavin 2004). The logging ban was applied uniformly across provinces, in spite of the fact that that many areas had not been affected by the flooding, such as Xishuangbanna, nor were they in the watersheds of the Yangtze. Restricting the relative autonomy villagers gained after decollectivization, the policy represented a new iteration in China’s history of the centre reasserting control over peripheral resource management (ibid.). Secondly, within the Great Western Development strategy that contains both neoliberal marketization schemes and so-called “ecological construction” projects, the central government launched another uniformly-applied program in 2000 that compensates farmers with grain and cash for afforesting hillsides over 25 degrees in slope. Ironically, rubber trees count as “forest cover” under this Sloping Land Conversion Program, or grain for green, which has led some farmers in Xishuangbanna to receive compensation for planting rubber trees (Sturgeon and Menzies 2006).

Backed by a strong crisis mentality employed by the state, these large-scale state projects harken back to political campaigns of the Mao era (Economy 2002; Sturgeon 2007). As Blaikie and Muldavin (2004:538) note:

In China, the ability for mass mobilization dwarfs similar efforts in much of the rest of the world. There is a culture of pride in the ability of the state and its local organs to bring thousands if not millions of individuals together to battle identified problems or natural disasters.
Furthermore, the state’s current crisis environmentalism continues to powerfully reproduce the denigratory view of the peasantry, activating what Blaikie and Muldavin (2004:538) refer to as the “strategic discursive weapon on the part of state.” For example, minority nationalities in Xishuangbanna are commonly labelled as “destroyers of the environment” (Sturgeon and Menzies 2006: 22), a view also shared by scientists and state farm personnel during my fieldwork. At the same time, however, these farmers have clearly succeeded in the government’s prescribed economic development aims related to rubber (Sturgeon 2010). As a result of these rapid changes, several national policy changes within the past decade have significantly affected Xishuangbanna farmers’ livelihoods and property relations, and therefore present important background for understanding farmers’ viewpoints on the local economic development and ecological restoration examined in my research.

When China joined the World Trade Organization in 2001 the price of rubber became based on the global market price, and in 2003, the price of rubber began to rise dramatically (Sturgeon 2007), causing an unprecedented increase in the farmers’ incomes. Additionally, the central government had repealed the agricultural tax on rural peasants beginning in 2003, a change informants greatly appreciated. The government also began subsidizing household goods, such as refrigerators, televisions, solar hot water panels, and automobiles. Meanwhile, many farmers were continuing to clear new land for more rubber. Several farmers said that although legally forbidden, these new rubber plots were still planted on various kinds of land, including community and watershed protection
forests; Dai holy hills; and household parcels too far from their villages to have previously been worth the investment. Furthermore, in the past decade farmers have increasingly been swapping and leasing land plots for profits. In fact, the vending of land contracts—sometimes without rubber trees but more often with rubber trees already planted—is quite prevalent in Xishuangbanna and openly advertised. Farmers said they have used land leasing to obtain lump sums for investments such as motorcycles, cars, children’s school tuition, and even paying gambling debts when necessary.

The recent changes in the state policy governing forest tenures also affect farmers’ land swaps. After successful results in pilot projects from 2000 to 2006, in 2008 the State Council released the “Guidelines on Fully Promoting Collective Forest Tenure System Reform.” The policy granted villages the right to decide on the devolution of use rights on collective forestland to individual households, groups of households, or private contractors (Xu et al. 2010). The policy also calls for surveying, delimiting, and registering the plots of collective forestland, and issuing title certificates for a contract period up to seventy years. With particular importance to Xishuangbanna, these stipulations can be applied retroactively in collective forestlands already divided among households. According to Xu J.T. et al (2010: 17), the policy represents both a significant clarification and strengthening of household tenurial rights and “a major step towards a private land market for forest land.” Yet they also caution “…the forest land market is being liberalized before a regulatory environment is in place which clearly guides land allocations and contracts and ensures adequate judicial
processes for grievance and redress” (ibid.). These concerns seem relevant in the light of the policy edicts and controls over land use that have occurred in Xishuangbanna since the 1950s. In any case, the leasing of long-term land contracts is now commonplace and intersects in important ways with state policy formulations and ecological restoration projects. Chapter 5 explores these intersections through looking at the effects of all these changes on farmers and their land use decisions.

Spanning the tumultuous six decade period leading up to 2010, this chapter has examined several important transformations in Xishuangbanna. First, China’s property rights were collectivized in the 1950s under Mao, and then decollectivized in the early 1980s under Deng’s Reform and Opening policy. Significantly, collective land was divided into household plots. This paved the way for dramatic livelihood transformations in the 1990s, such as planting household rubber plots, and other changes that continue to the present. Finally, there have been significant sociocultural transformations as well. Chapter five examines these processes in further detail.
4: THEORY

This chapter presents the bodies of literature and their theoretical cornerstones that I use for approaching my research and working through the findings. I first overview the science and practice of restoration ecology, its key principles, and the importance it is gaining globally from recognition of the severity of degraded environments. As ecological restoration projects have expanded in number and size, often without regard for livelihoods and resource access of the local populace, various scholars over the past two decades have called for refining restoration ecology by integrating socioeconomic benefits. In the following section, I present restoration cases that exemplify such integration and discuss their conceptual implications for my study and for restoration ecology in general.

Where these efforts at improving restoration ecology do not go far enough, however, I suggest the addition of a more critical toolset. To provide this I turn to political ecology to demonstrate the scope it could provide for advancing restoration ecology. Political ecology focuses explicitly on politics at multiple scales and how these various scales of influence affect a localized problem. Understanding the politics underlying restoration, and how they play out, shows the need to focus on socioeconomic concerns, including politics from the household scale on up. An important component of multi-scalar politics is access to natural resources. To this end, I next discuss theories on property rights to
present the lenses they offer for illuminating the politics at hand. Lastly, I
examine how property is embedded with power relations and cultural identity and
how these affect restoration plans.

4.1 Restoration Ecology

Vaugh et al. (2010) define restoration ecology as “the scientific study of
repairing disturbed ecosystems through human intervention.” Similarly, Higgs
(2005: 159) argues that restoration ecology consists of “the suite of scientific
practices that constitute the emergent subdiscipline of ecology and comprises
what we consider typical of a contemporary natural science: hypotheses,
conjectures, testing, experiments, field observations, publications, and debate.”
The discipline’s theoretical foundation is derived from numerous branches of
ecology, including community ecology, evolutionary ecology, paleoecology,
macroecology and others (Falk et al. 2006). The theory provides restorationists
with the science underlying ecological processes, such as spatial heterogeneity
and ecosystem functionality; population persistence and resilience; genetic
diversity and adaptations; trophic structure and disturbance regimes; thresholds
and equilibria; and food-web networks (Palmer et al. 2006).

Ecological theory also plays a significant role in determining benchmark
conditions to restore degraded ecosystems. How to select benchmarks, however,
along with the means to achieve them, are not undisputed issues within the
discipline. These are fundamental issues because benchmark conditions will
define the scope of the project. Furthermore, key questions surround the
negotiation of social and economic factors involved with restoration projects and
how to address them in project design and management. These debates have roots in restoration ecology’s course of development and continue to have implications for the field’s current trajectory.

Looking historically, ecological restoration practices have arguably been taking place for millennia, but the technical science underlying these practices in North America began to take shape with Aldo Leopold’s experiments in Wisconsin during the 1940s (Higgs 1997). Four decades later, with increasing public and academic attention focussed on widespread environmental degradation and a parallel growth in the field of ecology, restoration ecology started to crystallize within biology departments. Restoration ecology’s academic niche had emerged in response to two factors: the need for an institutionalized array of restoration methods; and efforts to enhance ecological theory (Palmer et al. 2006). In fact, restoration ecology was even said to be the “acid test” for the application of ecological theories and models (Bradshaw 1983; 1987). In other words, ecologists could assess, for example, the plausibility of their ecological genetics hypotheses in the process of restoring landscapes (Falk et al. 2006).

By the 1990s, however, the efforts in academia to delineate and solidify the field of restoration ecology faced problems concerning the underlying ethics in restoration decisions (Cairns and Hackman 1996). What species were selected, how landscapes were spatially structured and for what ends, were debated topics that fed into broader questions on deciding benchmark conditions, and the role of restoration ecology in general.
These discrepancies fuelled the contested process of establishing a definition for ecological restoration, which went through iterations for years within the Natural Resource Council (NRC), the Society for Ecological Restoration International (SER), and other fora. Varying definitions alter the purview of restoration ecology and the parameters of restoration projects. For example, whereas the NRC defined ecological restoration as “the return of an ecosystem to a close approximation of its condition prior to disturbance” (NRC 1992: 2), the SER termed it as “the process of repairing damage caused by humans to the diversity and dynamics of indigenous ecosystems” (Jackson et al. 1995). Two key differences arise from these definitions. First, the former definition emphasizes the replication of predisturbance conditions (Cairns and Heckman 1996), thus implying rigidity in adhering to the recreation of those conditions. In contrast, the latter definition allows flexibility in determining the restored conditions, simply striving for “the diversity and dynamics of indigenous ecosystems.” Also, this second definition allows for variable definitions of what constitutes damage and from whose perspective. These differences do not necessarily mean one definition is better, and indeed both have pitfalls. The implications of each definition, however, are important in practice. For example, a project working under the SER definition and its more flexible parameters could utilize a mix of non-native and native plant species for a wetland restoration, thereby still meeting goals for prior plant diversity and hydrologic dynamics. However, the more rigid parameters of the NRC’s definition might preclude a project from being able to use non-native species.
A second important difference between these definitions lies in the NRC not including the reason for needing restoration, whereas the SER makes anthropogenic effects explicit (Cairns and Heckman 1996). Recognizing the social forces involved in ecosystem change leads to a broader focus for restoration ecology; one that is argued as essential for restoration success (Higgs 2005). Cairns and Heckman (1996: 170) add that “social realities are often as important to restoration plans as scientific theories and predictions,” flagging social realities such as legislative and economic contingencies, community opinion, and risk evaluation. The calls for integrating socioeconomic safeguards and benefits into restoration projects stem from the need to prevent the deterioration of restoration initiatives that can occur when affected communities’ resource access or livelihoods are not adequately taken into account. To this end, some scholars have brought attention to the underlying politics of ecological restoration and how social conflict can arise from restoration projects (Light and Higgs 1996; Swart et al. 2001). Yet such issues have been minimally addressed by other scholars. This is unsettling in light of the increasing emphasis on restoration globally.

On balance, since the 1980s there has been work on broadening ecological restoration projects and research beyond biophysical components. Janzen (1988) reports on “biocultural restoration” in Costa Rica that combined community-building initiatives with forest restoration and conservation. Likewise, Rogers-Martinez (1992) details the integration of cultural legacies of Native Americans in the Sinkyang Intertribal Park’s restoration project. More recent work
furthers these themes, while showing current progress and work still to be done. To illustrate, I provide three cases representative of restoration projects that address socio-economic dimensions.

Blay et al. (2008) detail a collaborative project in southern Ghana with the Forest Research Institute of Ghana (FOGIG) and ten farming communities adjacent to forest reserves. The project coupled forest rehabilitation with increasing livelihood opportunities in areas with minimal security in farmland access. From the start, farmers and chiefs were consulted for recommendations on the project and selecting indigenous tree species to cultivate in agro-forestry plantations. Farmers received land for crops, technical training, seedlings, and benefit shares, while also attending meetings and educational workshops. The authors' interviews and surveys found the project to be successful in the high participation rate and support reported from farmers and chiefs; 250 hectares of plantations established with farmer-determined species in four years; and decreased clearings in adjacent forests. They conclude by briefly flagging the necessity of secure tenure systems—backed by "binding documents based on well-formulated national policy and supportive legislation"—for ensuring durable forest rehabilitation in Ghana (ibid.:516). Although rarely addressed in restoration ecology literature, the importance of addressing tenure relations is examined later in this chapter and in chapter 5.

Second, reviewing wetland restoration projects in Spain, Comin et al. (2005) assert that restoration success hinges on a balanced integration of scientific-technical, social, and economic perspectives. In South Aragon, for
example, collective goal setting and evaluation among fishers’ associations, farmers, and municipal environmental authorities led to an expanded, long-term restoration program funded by the public. In regards to all ecological restoration, the authors stress the risk of project failure without early collaboration among stakeholders and an explicit plan to be followed. In short, having an open collaborative process is an important lesson from this case for restoration ecology.

Third, Barrow et al. (2002) cover the holistic restoration achievements in the Shinyanga region of Tanzania from adopting a traditional land and resource management system, *Ngitili*, of the indigenous Sukuma people. After decades of failed destocking and reforestation campaigns by the state government, the Shinyaga Soil Conservation Programme turned to the Sukuma system for a different approach. The project used participatory rural appraisal tools for farmers to identify problems and solutions, which led to expanding *Ngitili* practices and applications. Significantly, the project increased *Ngitili* from 1000 ha to over 250,000 ha, and improved livelihood security with the restoration of diverse non-timber forest products and services as well. Moreover, success is particularly attributed to the project’s integration of traditional institutions such as community assemblies, customary law systems and village guards instead of state agents and external enforcement officers. The integration of traditional institutions is a key lesson for restoration ecology from this case.

The three studies illustrate benefits of addressing socioeconomic factors and indigenous knowledge in ecological restoration projects; and indeed, the
authors emphasize their importance explicitly and call for others to follow suit.

Moreover, even the Editor-in-Chief of *Restoration Ecology* (Allen 2003: 2), in advocating for a broadened journal focus inclusive of social dimensions in restoration, argued that

> Restoration is not only about the science of ecology but it also includes societal decisions on appropriate end points for restoration, economics of restoration and the valuation of nature, policy and planning, education and volunteerism, and social and philosophical issues.

Allen and the case studies above bring needed attention to social and economic preconditions for successful restoration. However, social and economic dimensions are inevitably political ones as well, and such recognition needs to be explicit. In fact, I suggest any restoration is unequivocally political in that “it holds implications for the distribution and control of resources” (Robbins 2004: 9). Politics are inherent to ecological restoration and how they play out can have important effects on projects and stakeholders. Such politics can cause local conflicts, and are entwined with uneven power relations, historical contingencies, and cultural meanings. The following cases illustrate the importance of understanding politics in ecological restoration.

> China’s Sloping Land Conversion Program (SLCP), also known as ‘grain for green,’ compensates farmers with grain and cash for afforesting hillsides over 25 degrees in slope. Full implementation started in 2002 across 1897 counties in 25 provinces, mainly in the west (Bennet 2008). The project aimed to convert 14.67 million hectares of cropland and “roughly an equal area of wasteland” into
forests by 2010, making it one of the largest land retirement and reforestation programs in the world (ibid.: 700).

The SLCP has led to participants succumbing to social and political pressures to convert some of their agricultural land to forests. Some participants fail to receive financial and/or grain subsidies, and many locales experience a reduction in incomes and increased reliance on non-local food sources (Bennet 2008; Xu and Tao 2007). According to Weyerhaeuser et al. (2005: 251), under the SLCP “frequently, forestry agencies require that land is converted in contiguous parcels, which means that several households must convert land together, and that some are therefore ‘coerced’ or ‘persuaded’ either by neighbours or village cadres.” Furthermore, a survey by Xu et al. (2006: 605) showed that over 65 percent of households did not have the right to decide how much of their land was converted, and over 69 percent did not even have the right to choose which piece of land was converted. The SLCP illustrates the shortcomings of restoration with only superficial socioeconomic goals and devoid of participatory planning and management.

A second case that illustrates the politics of ecological restoration lies in the restoration programs of Vietnam. Started in 1992, Program 327 was meant to contract local farmers to protect and reforest rehabilitation zones of state-designated special use forests of national parks, with farmers receiving pay for labour, seedlings, and tending expenses. However, Sowerine (2004) shows that, instead of the farmers, local and regional elite used their positions of power to capture the forest protection and reforestation contracts. This preferential access
to the contracts led to increased disparities in income between elites and farmers. Furthermore, the reforestation contracts effectively became “a new property grid superimposed on villagers’ customary property arrangements” Sowerine (2004: 113). Local elites gained control over farmers’ land, while ironically farmers had to plant exotic eucalyptus and acacia trees in exchange for temporarily growing cassava in the understory. There were only minimal conflicts because of farmers’ fear of drawing attention; past government settlement programs and national park regulations had made farmers’ land use practices illegal (ibid.).

In 1998, Program 327 was supplanted by Vietnam’s nation-wide Program 667, or 5MHRP, a five million hectare forest restoration project meant to increase forest cover to 1943 levels and reduce poverty. McElwee (2009) explains that according to official reports forest cover has increased, but this is mainly from plantations of exotic species used for industrial purposes. Similar to Program 327, 667 has also resulted in rich households gaining more land, and poor households losing land and access to non-timber forest products, which are both economically and culturally important for many households. Although framed as poverty alleviation, projects under both of Vietnam’s programs are formulated by government staff without consulting local people, and the objectives thus do not reflect poor households’ realities (ibid.).

Of course, politics in restoration occur outside of Asia as well. Although devoid of the significant livelihood effects as in the cases above, ecological restoration projects in the U.S. are also affected by stakeholder conflicts (Egan et
al. 2011). In Cook County Illinois Forest Preserves, restoration of oak savanna landscapes in the mid-1990s involved tree removals, brush burnings, and herbicide use. By 1997, the project was halted by officials amidst controversy over the project’s methods and claims that the restorationists were hiding their activities from the public (Gobster 2000). In particular, neighbouring property owners, with heritage homes designated by the city of Chicago, mounted strong opposition against the project because of the methods, perceived exclusion, and lack of transparency. Opposition from some of the public also centred on these factors, along with the perceived threats to the forest preserves due to restoration methods involving removing trees and using fire and herbicides. The project was eventually restarted after large public hearings and bureaucratic hurdles (ibid.).

Furthermore, similar controversies have surrounded the restoration of native dune habitats in Florida. A project at The Nature Conservancy’s Blowing Rocks Preserve in Tequesta involved removing hundreds of exotic Australian pines and regrading the site. Local residents opposed the project based on their love for the trees and their shade, which they had grown up with (Shore 1997). After years of the Preserve’s efforts in public environmental education and replanting native species, the project became generally accepted by local residents. In sum, along with the Chicago case, the two projects highlight the potential for conflict with ecological restoration in the U.S. stemming from conflicting notions of what “nature” is and who and what should be protected.

Comparing cases of restoration politics in rural Asia and affluent U.S. communities shows that they do in fact share important lessons for restoration
ecology. Restoration that ignores political and cultural contexts, and lacks a fully collaborative process among stakeholders, can lead to conflicts and jeopardized projects. The cases demonstrate the importance of examining the range of complexities facing ecological restoration. Indeed, politics, historical contingencies, and cultural meanings underlie any restoration project and need to be fully understood for successful restoration. Contention surrounds the questions of who defines “degraded,” what needs restoring, and for whom. As such, a stronger analytic approach is needed for ecological restoration, one such as found in political ecology.

4.2 Political Ecology

What political ecology adds to ecological restoration is its approach to probing the problem of how current conditions arose by focussing on the dialectical unity among nature and society. That is, political ecology dispels the putative dualism of nature and society, holding paramount their interdependency instead (Neumann 2005). As a corollary, then, environmental problems are the result of social processes: “environmental problems [are] social in origin and definition” (Watts 2000: 259). Such social processes cannot only be linked to historical contingencies, but are also embedded in concentric scales of influence. These historical materialist and multi-scalar perspectives, adopted from political economy, are central to the theoretical toolset political ecology brings to understanding causes of environmental change. Coupled with its methodological breadth, political ecology thus supplies the means to address what is lacking in
ecological restoration. The following brief overview of the field’s development provides important background to the parts of political ecology I use in this thesis.

Out of the many conjunctures leading to the formation of political ecology, most germane to this study were the prior explanations for ecological change. Transformations in Third World ecologies following greater articulation with capitalist economies in the decades after World War II drew increased attention from Western development agencies and institutions (Neumann 2005). The result was neo-Malthusian narratives of overpopulation and poverty of peasants being linked to environmental degradation in a cause-effect relationship (Jarosz 1996). In a nod to colonial precedents, these narratives were absorbed and reproduced by many Third World politicians and line agencies, with policy prescriptions to limit population growth, teach peasants how to farm, and introduce new technologies (Robbins 2004).

Alternative explanations came from the field of cultural ecology, which attributed environmental degradation to cultural maladaptation. The field viewed agrarian communities as “autarkic, self-regulating human ecosystems,” and tried to “reconcile the realities of an expanding and deepening global capitalist economy with concepts of self-regulating homeostasis and cultural adaptation” (Neumann 2005: 20, 22). In this respect, cultural ecology remained blind to political forces underlying environmental changes and reinforced a notion of dualism between humans and environments.

This all changed though after Michael Watts “took a wrecking ball to cultural ecology’s epistemological foundations” by integrating political economic
theory to reconceptualize nature-society relations as a dialectical unity (Neumann 2005: 22). As opposed to a cultural maladaptation explanation, Watts’ (1985) research revealed how Nigerian peasants’ vulnerability to drought and famine was a result of the effects of colonialism on social relations of production and their articulation with global capitalist economies. Significantly, Watts’ use of travelogues and colonial archival material, among other methods, demonstrated how crucial historical analyses are for understanding environmental change and current social and political relations (Neumann 2005; Robbins 2004). Aided by geography’s turn to social theory during the 1970s, new doors had opened for analyzing nature-society relations and their processes of change. Foremost among these was Marxian political economy.

By the 1980s, geographers began combining historical analyses and political economic dynamics with ecological studies to create a new approach for understanding sociocultural and environmental changes: “political ecology’ combines the concerns of ecology and a broadly defined political economy” (Blaikie and Brookfield 1987: 17). Although a theoretical keystone in political ecology, defining the meaning of political economy in political ecological studies has been a source of much debate amongst scholars (see Vayda and Walters 1999; Peet and Watts 2004). I flag this problem to clarify here what political economy means in this analysis. As Mann (2009: 337) writes, the “oft-cited but vague ‘broadly defined political economy’…of Blaikie and Brookfield” has “an extremely helpful elaboration” in Peluso and Watts’ (2001: 29, emphasis in original) explanation of the three parts of social relations of production:
1. *The patterns and regimes of accumulation* (what Perry Anderson called the “jagged rhythms and breaks and uneven spatial distributions and displacements of capital accumulation” (1980:33); 2. *The forms of access to and control over resources* (what we generally call entitlements and modes of enforcement); and 3. *The actors (firms, workers, peasants, state operatives)* that emerge from the social relations of production.

The second point above underscores the importance of property rights to production relations and to restoration ecology. The description above illustrates well the multiple scales of analysis that political economy brought to examining nature-society relations. Whereas cultural ecology was ahistoric and apolitical, adding the political economic lens provided a research framework inclusive of temporal, spatial, and administrative scales of influence that surround a localized problem. In doing so, the political ecology approach took shape.

Since then scholars have produced numerous definitions of political ecology in debates over its scope and tenets (see Walker 2005). Robbins (2004:12) lays out seven definitions from various authors to summarize political ecology as: “empirical, research based explorations to explain linkages in the condition and change of social/environmental systems, with explicit consideration of relations of power.” Robbins highlights key components, and importantly identifies the centrality of power relations. A more helpful explanation of political ecology for the purpose of this study is Paulson and Gezon’s (2005) outline, worth quoting in full for its detail and historical references.

Early political ecology developed around a set of core concepts. First is the idea that resource use is organized and transmitted through social relations that may result in the imposition of excessive pressure of production on the environment (Watts 1983). Second is the recognition of a plurality of positions, perceptions,
interests, and rationalities in relation to the environment (Blaikie 1985, 16) such that one person’s profit may be another’s toxic dump. Third is the idea of a global connectedness through which extra local political economic processes shape and are influenced by local spheres. And fourth is the refined concept of marginality, in which political, economic, and ecological expressions may be mutually reinforcing: “land degradation is both a result and a cause of social marginalization” (Blaikie and Brookfield 1987, 23).

The examples of political ecology research in China that follow illustrate the utility of these concepts for examining the restoration project at hand.

4.2.1 Political ecology research in China

Muldavin’s research (1996; 2000), ranging from government offices in Beijing to farming households in multiple provinces, presents the social-ecological effects of China’s reform-era transformation from peasant-state to peasant-market relations. On top of socioeconomic stratification and a breakdown in social services, the shift also generated widespread exploitation of communal capital and severe environmental degradation: “more intensive cropping patterns; increased and uncontrolled use of destructive chemical inputs; a decline in agricultural infrastructure investments;… and the rampant destruction of ecosystems…” (Muldavin 1996: 236-237). A crucial factor to understanding the reform-era changes is the “decline in the power of collective participatory institutions at a local level and the receding role of the central state, as local state representatives garner increased power…” (2000:265). To this end, it is important here to briefly note the “bifurcated state” (Guo 2001) view prevalent in China, whereby the populace sees the central state as benevolent and the local state—whether at the township, prefectural, or provincial level—as the opposite.
The farmers I worked with in Xishuangbanna felt this way quite strongly. Muldavin concludes, furthermore, that the reform-era social stratification and changes in natural resource control have produced resistance to state policy initiatives (2000: 268).

Muldavin’s work illustrates well the common conflict in China with untrustworthy local state organs gaining increased power even as the state policy initiatives they enforce face resistance. As I cover later on, farmers see themselves as apart from state initiatives. In Xishuangbanna, the local state’s track record and lack of credibility in peasants’ eyes present considerable barriers to forest restoration prospects initiated by the prefecture. As Muldavin notes, however, in places “where entitlements and social capital investments have been maintained, the articulation of the local with the global through the market is enabling heretofore unexpected hybrid strategies for improving livelihoods” (2000: 265). This is precisely the case in many villages in Xishuangbanna, and such social capital provides space for restoration to proceed.

Extant political ecology research in Xishuangbanna provides further insight to the socio-political context underlying my study by highlighting the effects of different ideologies promoted by the state. Sturgeon and Menzies (2006) demonstrate the state’s production of socio-spatial divides with respect to rubber: “a medium through which the state managed ethnicity, producing a form of ethnic governmentality” (ibid.: 22). This process first occurred during the high socialist period (1949-1978) with the state ranking ethnic minorities as having a
lower level of social development than the Han and excluding minorities from state farms. The creation of state rubber farms in Xishuangbanna began in the 1950s by Han scientists and labourers brought in from other prefectures and provinces because the local minorities were deemed as lazy and backward by the state. Up to 1979, rubber was cultivated exclusively on state farms, reflecting “the leading edge of the Han, scientific, progressive, modern drive to transform production from a peasant mode of production to an industrial one” (ibid.: 34).

After the China’s economic and property rights reforms though, state agencies began to encourage minorities to cultivate rubber in the 1980s to alleviate poverty and raise household incomes (Sturgeon and Menzies 2006). Further state promotion and widespread expansion of smallholder rubber cultivation in the following decades led to minorities’ acreage of rubber plots surpassing the state farms. However, state farm expansion had ceased by 1988 due to land limitations, and increased state attention to deforestation and biodiversity loss in the 1990s resulted in “discourses of environmental protection that portrayed Han scientists (including state farm administrators) as knowledgeable about environmental conservation and biodiversity protection, while condemning minority farmers as ignorant and backward destroyers of the environment” (ibid.: 22). As Sturgeon and Menzies explain, these discourses reproduced the socio-spatial hierarchy of the Xishuangbanna landscape: “the location of backward and modern spaces is much the same as before, but now underpinned by environmental rather than revolutionary socialist ideologies” (ibid).
In my fieldwork, CAS scientists and Han state farm personnel continue to cast the farmers as environmental destroyers and ignorant of ecological dynamics. Farmers, meanwhile, are generally perplexed by contradictory state rhetoric that strongly pushes economic development—“the hegemonic modernization discourse” (Muldavin 2000: 268)—on one hand, with periodic environmental protection campaigns on the other hand. Therefore, recognizing the underlying ideologies at play, along with their legacies and transformations through time, helps explain how various actors respond to changing political ecological conditions and restoration initiatives.

A common thread throughout the cases above and many other political ecology studies lies in the attention to property regimes' influence on resource control and access. Property relations thus present an effective means for integrating social and environmental analysis; tracing multiple scales of influence on local use; and revealing processes of accumulation and dispossession over time (pers. comm. Sturgeon 2011a).

4.3 Property Relations

Property relations are central to this thesis because they link social factors—such as policies, markets, labour, kinship ties, and contracts—with land and natural resources. Property offers a way to decipher the intersecting levels of politics at play in Xishuangbanna, from households up through various levels of the state, and to sort out how these multiple sites affect prospective forest restoration. The following section introduces conceptions of property important to the foundation of empirical discussions in subsequent chapters. First I outline
here several scholars’ notions of property and approaches to understanding property. This is followed by a review of theories on fuzzy property in post-socialist contexts. Lastly, I examine research on the role of property in cultural identities, an element crucial for my understanding of the farmers and their perspectives on forest restoration.

In C.B. Macpherson’s (1978:1) influential book, Property: Mainstream and Critical Positions, he defines property as “a man made institution which creates and maintains relations between people.” He shows how these relations are fundamentally based on claims asserted on things, and that such claims are enforced by society or the state, differentiating property from arbitrary possession. According to Macpherson, “property is not things but rights, rights in or to things” (1978: 2, author’s emphasis).

This stance is reflected in the popular description of property as a ‘bundle of rights’ coined in the nineteenth century by Sir Henry Maine (Hann 1998), delineating the host of rights entailed in property such as alienation, usufruct, and exclusivity. This bundle, however, often expands when dealing with resource use in non-Western settings. For instance, Bruce and Fortmann (1988: 2) note, “it is not at all unusual for a village to have a certain tenure over a piece of land, while an individual or family has another tenure over part of the same land, and the state asserts a residual title in the same land.” As I will shown later on, certain areas in Xishuangbanna mimic this hypothetical case.

Of late, some scholars have revised the bundle of rights notion to address broader complexities inherent to property. Ghani (1996: 3) formulates property as
a “bundle of powers; crystallized into marked forms of practice; having routinized rules of the game; regulating domains of rights of inclusion and exclusion...” (cited in Verdery 1999: 104). In following Ghani, Verdery (1998: 161) argues for analyzing property with respect to “the whole system of social, cultural, and political relations.” Moreover, Peluso (1996: 513-14) extends this view by stressing attention to process, also emphasizing property’s role in political ecology:

A dynamic view of property compels a focus on process, rather than simply on the institutions, social structures, or bundle of rights and responsibilities that are particular outcomes of processes and negotiations. The study of property as process requires multi-layered analysis, as has been the practice of political ecology. That is, one needs to study both local histories and the layers of political economic influences that affect local practice.

In essence, Verdery and Peluso analyze property in terms of resource access, an approach also employed by other scholars. For Sturgeon (2005a: 37), “resource access has a broad meaning that includes formal property allocations, customary practices of access, and local accommodations to—and reworkings of—state-given property rights”. In other words, resource access explicitly takes account of both the de jure (legal) and the de facto (extra-legal) “mechanisms, structures and relations governing resource use” (Ribot 1998: 310). Extra-legalities can include social identity, or coercion and trickery; thus property discussions limited to only legal rights and formalities preclude crucial elements involved (ibid.). According to Ribot, focussing on access rather than rights better illuminates the political economy of distribution: who benefits, and how? As such, he concludes, “access does not replace property, but rather it encompasses
property, putting property (and other forms of) rights in their place among the whole array of mechanisms, structures and relations at work” (1998: 312). These include both “the socially sanctioned and the illicit” (ibid.). In sum, a resource access focus broadens the scope in the analysis of property relations and highlights power relations.

Theory on post-socialist property relations presents additional conceptual tools for examining resource access in Xishuangbanna. Sturgeon and Sikor (2004:16) describe ‘post-socialist’ as entailing “a set of very different regimes in which exchange has shifted from administrative decisions towards market allocation, and control over capital has moved from the state to private actors.” In China, this shift started in 1978 and led to the decollectivization of communal resources. This transition resulted in significant heterogeneity of state-allocated property rights within and across provinces (Yeh 2004), adding yet another layer onto the remnant customary and collective-era practices and tenures. As in other post-socialist locales, the outcome consists of complex property patterns that are confusing and ambiguous from the neoliberal, private property rights viewpoint (Sturgeon and Sikor 2004).

Verdery (1999:56) coined such “indistinct, ambiguous, and partial property rights” as ‘fuzzy.’ Yet she also points out this view is not necessarily shared by local resource users because of their comprehension from on-the-ground involvement. Sturgeon and Sikor (2004:7-8) summarize Verdery’s four causes of the apparent ‘fuzziness’:
First, different people may hold conflicting claims of ownership to a single object, causing ownership to be ambiguous. Second, different people may hold overlapping claims to an object...[Third], fuzziness ‘will lie precisely in the lack of routinized rules and crystallized practices around private property in the context of post-communism’ (Verdery 1999:55). A fourth cause of fuzziness resides in the ‘constraints on exercising the bundle of powers’ (ibid.).

Verdery (1999: 76) illustrates fuzzy property through detailed ethnographies of property relations in the post-socialist transition of the Romanian village Aurel Vlaicu, and emphasizes the importance of “ethnography not just of the transition but in the transition” (emphasis in original). She highlights fuzziness in two episodes following the implementation of property restitution policies by the state. The first episode’s examples of fuzzy property stemmed from the 1991 Agriculture and Land Resources Law’s constraints on individuals’ private property rights, such as the state mandating the cultivation of land and also prohibiting changes in land use. Additionally, through state policies favoring the formation of agricultural associations out of former socialist-era collectives, the Law produced “a systemic bias towards quasicollective property arrangements” (Verdery 1999: 59) that limited individuals and pressured them to join the Aurel Vlaicu agricultural association.

The second episode details a court case about a disputed auction of a granary built with collective labour during the socialist era. An individual originally from outside the village claimed to have won the auction because the agricultural association called off the bidding to consult with their constituents. That this individual had not invested labour in the granary contributed to the village community’s strong opinions against his claimed ownership. As a result, “...the
trial mobilized deeply held senses of the self and valued notions about community” (Verdery 1999: 74). This point is central to Verdery’s study because of her emphasis on boundaries in property, particularly between self and non-self. Verdery shows that ‘self’ applies to not only individuals but to the collective as well. The case underscores the apparent fuzziness of post-socialist property relations in that “property understood collectively lacks the clear edges of an ideologized notion of exclusive private ownership” (ibid.: 75).

As Verdery illustrates, the neoliberal blueprint for privatized, exclusive property rights can conflict with the property dynamics among resource users in post-socialist contexts to create identity boundaries, uneven power relations, and social struggles. I describe in chapter five similar processes taking place in Xishuangbanna. However, in applying Verdery’s conceptualization of Romania’s post-socialist property dynamics to Xishuangbanna, important differences of post-socialist China stand out. Indeed, China is still governed as a party-state, and the state still holds formal ownership to land (Sturgeon and Sikor 2004: 3). Additionally, in my reading the pre-socialist property regimes of rural Romania seem more absolute, whereas Xishuangbanna contains more complex resource access legacies stemming from prior shifting agriculture practices and collective arrangements.

Analyzing fuzziness in property helps to reveal the range of positions on property arrangements and power relations at play. Two cases illustrate the effects of multiple property perspectives in post-socialist China and their effects on social relations and identities. Yeh’s (2004) study in peri-urban Lhasa, capital
of the Tibetan Autonomous Region [TAR], examines the ambiguity in ethnic-Tibetan peasants’ land tenure since China’s decollectivization reforms. Although farmland tenure in China is legally held by village collectives (citing Ho 1998: 403), in the Tibetan peasants’ perspective the Communist Party in fact controls the land. Yeh shows how this perception is caused by township governments’ manipulation of land allocations, such as cases of farmland expropriation from peasants for constructing retirement homes and greenhouse projects, and township officials incorrectly informing peasants that farmland tenure is held by the state.

Significantly, the peasants’ confusion about property land rights is also influenced by Tibetans’ inability to contest land expropriation due to the state’s suppression of their civil liberties (Yeh 2004: 170). Whereas legal means exist under state law for all citizens to raise rightful claims, Tibetans eschew doing so in fear of having their claims viewed as being linked to Tibetan independence activities. Even modest endeavors such as making civil claims against taxation changes have been deemed ‘hot topics’ by the state: “recognised as political protests, with punishment meted out accordingly” (ibid: 178). Therefore, “the effect—preventing citizens from exercising their legally defined rights—is part of the larger process of marginalisation” (ibid: 166). This interconnection of property ambiguity and marginalization underscores the effects fuzzy property can have on overarching social relations in which they are embedded. Moreover, this issue is relevant to my study because—although the minority nationalities in Xishuangbanna do not face oppression like Tibetans—marginalization also
affects the socio-spatial landscape in Xishuangbanna. Presented in detail in later chapters, the ethnic minority peasants I interviewed referred frequently to their low social status and the role it plays in their lives.

Moreover, Yeh (2004: 179) adds a new political element to the meaning of fuzziness from property relations research in Tibet: “such relations look fuzzy from the vantage point of idealised neo-liberal property rights—individualised, apolitical, clearly defined—because they are imbricated with complex questions of historical narratives of state legitimacy and uneven power relations.” Although questions of state legitimacy are not as prevalent in Xishuangbanna as Tibet, Yeh’s point is still relevant to my research due to Xishuangbanna’s complex power relations as another political and cultural periphery in China.

Secondly, Sturgeon’s (2004) study in upland Xishuangbanna’s Mengsong administrative village on the border of Burma illustrates the effects of conflicting property perspectives and claims on the identities of Akha peasants. Following the post-socialist property rights transformations beginning in the early 1980s after China’s Reform and Opening (gaige kaifang) policies, the state’s creation of exclusive property rights occurred at the same time as its switch from labour to land as the significant factor of production. In contrast to the collective era system of measuring work points for individual labour, during the reform period the state focussed on agricultural productivity via overall grain output per hectare. Under the household responsibility system, collective land was divided into separate household plots. These mapped and measured property rights created ‘legible’ landscapes for state planners’ annual production plans (ibid: 147). This
state vision of a productive landscape, however, conflicted with the Akha farmers’
diverse land use and de facto resource access patterns of swidden agriculture, or
shifting cultivation. Whereas Akha landscapes “were complex and mutable, both
spatially and temporally, and produced a great diversity of goods” (Sturgeon
2005a: 8), the state aimed for measurable and fixed property rights for a
landscape facilitative of its political-economic goals, such as grain production.

This contradiction, Sturgeon (2004) shows, also intersected with
contestations arising when a corrupt village head gained exclusive control over
swidden land at the expense of villagers’ long-held access. In this instance, the
peasants invoked their de facto rights established over centuries and their de jure
rights as being state citizens in backing their claims. The inseparability of
property relations and understandings of identity (Sturgeon and Sikor 2004:3) is
revealed in both instances of conflicting property perspectives evoking different
shades of identity within the Akha community. First, the post-socialist property
rights transformations ran against the grain of customary practices that are part
of Akha cultural identity. Second, the Akha identity related to being citizens of the
state was involved in making rightful claims against corrupt resource access
expropriation.

The inseparability of property relations and identities relates to the farmers
in my research. The freehold tenures that farmers gained under the household
responsibility system throughout Xishuangbanna in the early 1980’s coincided
with the beginning of smallholder rubber cultivation and their self-described rise
from poverty. Rubber farming success, the wealth it has generated, and pride in
these achievements now comprise a large part of individual and cultural identities. Complex and dynamic property relations are threaded through this transformation. As Verdery (1997: 109) contends, property "entails complex meanings, often revolving around ideas about labour, persons, community, and kinship." Thus through examining property relations we can gain insights into how these complex meanings affect rubber farmers' perspectives on forest restoration. Chapter 5 undertakes that examination.

This chapter examined three bodies of literature central to this thesis: restoration ecology, political ecology, and property. The three sections focussed on specific parts of these literatures most useful for the foundation of later chapters. The overlap amongst the three literatures centres on the different aspects of politics inherent to ecological restoration. Restoration ecology can be improved by considering politics explicitly, rather than by obscuring it under "social" and "economic" categories. Political ecology presents a conceptual framework and methodological tools for deciphering restoration politics at multiple levels. Property relations provide the lens for tracing the politics through time, space, and cultural meanings. To understand the expression of these dynamics in Xishuangbanna, the next chapter explores the proposed forest restoration.
5: LAND USE, RESTORATION, AND FARMERS’ PERSPECTIVES

This chapter examines the overarching narratives that emerged in my fieldwork and responds to my three research questions. First, how has the introduction and expansion of rubber cultivation altered environmental concerns among rubber farmers, and to what extent do these environmental concerns differ across generations and genders? Second, what individual, cultural, and socio-political factors affect farmers’ perspectives toward reforestation, and why? And third, how might past and current property rights arrangements affect reforestation decisions? To map out the chapter, the first section explains the CAS restoration proposal and its correspondence with standard restoration ecology. I then look at the farmers’ views on socio-ecological changes resulting from rubber cultivation and other land use changes. The final section looks at key aspects of property relations at three levels—households, villages, and extra-local—to illuminate how kinship, identity, village politics, and peasant-state relations affect farmers’ environmental concerns, livelihoods, cultural values, and attitudes toward restoration.

5.1 The Restoration Plan

An October 21, 2009 meeting was held between Xishuangbanna Prefecture leaders and members of the Chinese Academy Sciences (CAS) from Xishuangbanna Tropical Botanical Garden to discuss ecological restoration of
rubber plantations. Dr. Chen Jin, director of XTBG, presented a proposal for the prefecture to create 'environmentally-friendly rubber plantations' (huanjing youhaoxing jiaoyuan). The restoration plan consisted of three parts: (1) reforested corridors connecting the nature reserves within the Prefecture; (2) reforestation of 20 per cent of the area currently planted with rubber trees in the Prefecture into natural forests through converting roadsides, ridge tops and ravines; and, (3) planting cash crops such as tea, coffee, or medicinal plants in the understory of some rubber trees.

The six nature reserves in Xishuangbanna are protected under national legislation and are highly regarded by many scientists and officials for their biodiversity and the reputation this brings to the area. From the scientists' view, connecting the reserves with forested corridors would help restore the transfer of genetic stocks between the differing regions of the prefecture and also foster increased biodiversity in the prefecture as a whole. Xishuangbanna contains the highest biodiversity in China (Li et al. 2007), and is touted as China’s “biodiversity treasure” on a large sign in Jinghong (Sturgeon 2011b). However, the prevalence of monoculture rubber trees now jeopardizes that reputation.

In addition to decreased forest cover, the effects of rubber cultivation on weather patterns, water supply, and soil quality are also cause of great concern among the officials and scientists. The second part of the restoration plan addresses these issues by calling for reforestation on 20 per cent of land planted in rubber trees. One focus of the plan specifies ravines, due to their proximity to streams, and rubber trees' weak ability to store water. A second focus is on
reforesting ridge tops and roadsides to create buffers against the spread of pests and disease through large swaths of rubber trees (Chen 2009).

The third focus of the plan is on an agroforestry model of planting cash crops under rubber trees; tea, coffee, and medicinal herbs were suggested as viable options. According to the plan, the reasons for the agroforestry model are twofold. On the one hand, these crops would contribute to air moisture year-round and help alleviate the soil desiccation in the dry winter months when rubber trees lose their leaves. On the other hand, the profits from cash crops would give the laobaixing, or commoners, incentives to accept the project.

The restoration proposal resembles the approach of restoration ecology that was explained in the theory chapter. For example, it draws on elements from other branches of ecology, such as landscape ecology and community ecology, in using biodiversity corridors to link nature reserves, forest buffers to prevent parasites, and attention to hydrologic dynamics. To some degree, it also takes into account socio-economic factors by including cash crops for compensation. However, it is unclear how well the proposal’s landscape divisions and choice of compensatory crops for the understory will fare in practice. Since the goal is to restore previous landscapes, then what farmers know about land use histories and politics is part of the story. In fact, many farmers’ accounts are congruent with aspects of the proposal. At the same time, farmers’ narratives also portend fundamental political economic and biophysical obstacles regarding other aspects of the proposal. Thus there is a clear value in using political ecology’s
primary focus on local resource users to assess the restoration plans and the communities to be affected.

5.2 Socio-ecological Changes

To understand farmers’ responses to the proposed restoration we need to take note of the tremendous significance of rubber cultivation to farmers. The integration of rubber cultivation has dramatically changed their lifestyles and livelihoods. In fact, in 15 out of the 16 villages that I visited farmers reported every household had at least several plots of rubber trees (the exception was the Jinuo village Yanuo, which at 1200 meters above sea level, is too high to grow rubber). Households typically have one to four hectares of rubber trees in multiple plots of diverse sizes. Many households have about 300 trees per 10 mu (0.66 hectare), or approximately 450 trees per hectare. Households with three hectares of rubber, a common amount among those I interviewed, were averaging around 21,000 yuan (USD $3,100)\(^2\) per month. Multiplied by 8.5 months in the rubber season (early March to late November), their annual income in 2010 could be about 180,000 yuan (USD $26,500). According to farmers, the vast majority of household income now comes from selling latex, which other research from Xishuangbanna also shows (see Sturgeon 2010; Reuse 2010).

Rubber cultivation has led to significant social changes. In interviews, many farmers emphasized how rubber cultivation has changed farming schedules. For example, after revving their motorcycles and rousing every rooster, farmers set

\(^2\) 2010 conversion of 6.775 yuan per US dollar.
out to tap the trees at four in the morning and return around noon. Some days they must revisit the plots in the afternoon to brush fungicides on the trunks or spray the ground with herbicides and pesticides. Because of these rubber tasks, younger farmers—especially males and childless females—are becoming less involved with rice cultivation, while the generation in their fifties and sixties is working longer hours in paddies to compensate.

The increasing incomes and changing labour patterns from rubber cultivation are also affecting the cultural sphere of villages. For instance, there are far fewer Dai monks than previously due to household workloads and the financial lure of rubber farming. Whereas 50 to 70 percent of young males in Menglun’s Dai villages became monks the 1980s and 90s, current estimates ranged from “several at most” to “not even one percent.” However, increased incomes are allowing Dai families and villages to sponsor young monks from Burma to come live at the temples within their villages.

The socioeconomic effects of rubber profits are extraordinary. Farmers were emphatic about the meaning of their incomes from rubber. As a woman from Manbian stressed, “just like children needing to eat,” referring to a nearby toddler chewing an ear of corn, “our life relies on rubber money...it’s very important.” Many farmers now comfortably send their children to boarding schools and universities, buy new cars, build new houses (see Figure 5.1), and spend freely on gambling and alcohol. In interviews, rubber farmers of varying ages, from teens through those in their 80s, expressed the tremendous influence of rubber on their livelihoods and lifestyles. As one male in a group of 20 year-
olds put it: “rubber is our life” (xiangjiao jiushi women shenghuo). The quotation depicts well the sense of cultural identity that farmers draw from rubber, particularly those born after the Cultural Revolution.

Following Moore (1994: 383), I hold that resource politics are mediated by culture, and that “struggles over land and environmental resources are simultaneously struggles over cultural meanings.” In Xishuangbanna, the growing cleavage between the cultural meanings and understandings of younger generations and their elders is noteworthy because of the resulting effects on stances towards ecological changes and restoration. Although the necessity and importance of rubber was reported by all generations, the need for forest restoration was expressed predominantly by elders. This distinction is attributable to older farmers’ customary practices and relationship to environmental resources such as non-timber forest products (NTFPs) and wild fish. Conversely,
as I elaborate below, young farmers are far less involved in customary practices, and such environmental resources have nominal significance in young farmers’ livelihoods. The regional political economic transformations over the past decade have significantly affected this trend in terms of who participates in the increased numbers of fish ponds and the availability of NTFPs in local markets. NTFPs and fish are two important focal points for the divergent perspectives between elders and young farmers.

Young farmers nowadays seldom go to their village community forests. Collection of NTFPs is mainly done by elders. At least 42 young farmers from eight villages explained that it is easier to buy their wild mushrooms and bamboo shoots from local markets, and bamboo products such as baskets and chairs as well. A variety of bamboo species are used for hundreds of purposes, but most young farmers are not interested in these craftsmanship skills. As one young man put it, “There is no need to learn. I can buy those in town for cheap.”

Additionally, elders were the only generation to refer to the decline of medicinal plants in natural forests. For example, an elderly Dai doctor described two herbs that he cannot find anymore. One is used as a laxative, and the other is for skin ailments. He also spoke adamantly about the prevalence of kidney stones among young Dai farmers nowadays and its relation to alcohol consumption, water pollution and agricultural chemicals. Young farmers also spoke of how common kidney stones are among their friends, but in their eyes the rate of other illnesses such as colds and fevers in their villages was more significant. Traditional medicines, including acupuncture and other Chinese
traditional medicine, are seen by young Akha and Dai farmers as worthless and based on superstition. They, and middle generation farmers, emphasized the efficacy of Western medicine and its importance in dealing with the illness occurring in their communities. Colds and fevers were quite common in the villages of Menglun and I was astonished by the frequency of household trips to the central health clinic for treatment through intravenous injections. Young farmers considered the 100 yuan (US $15) per treatment to be reasonable, whereas several elders responded bluntly that this price was not worth it: “Hua bu zhuo!”

The second subject highlighting differences between elders and younger farmers is fish. In interviews, middle and older generations reported declines in wild fish over the past two decades. Farmers in their twenties also spoke of decreased catches compared to their youth. However, few young farmers even cast fish nets anymore; instead, they electro-fish with a car battery, probes, and a hand net. Whereas older Dai farmers still sew their own fish nets, very few young farmers know how to sew nets. Several elders explained how different the ethic accompanying electro-fishing was from theirs because when the older farmers cast nets, they always purposefully release some fish to maintain stocks and as a sign of respect. Most young farmers viewed the sign of respect as superstition. The maintenance of wild fish was not a concern for them due to the availability of fish from aquaculture ponds. For example, groups of young farmers pointed to Man’e and Mandajiu having restaurants with private fish ponds, and the Menglun

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3 In contrast, one session of acupuncture was 16 yuan at the same clinic.
central market’s abundance of fish. Moreover, some households raised fish in small floating pens near the riverbank.

For young farmers going fishing is recreation, and buying fish is another way to show their status to others. Ecological changes are not significant compared to their incomes and the resulting lifestyle benefits. They associate different meanings to the resources older generations see as culturally and practically important. Large disposable incomes from rubber cultivation factor into young farmers’ penchant for new products that demonstrate their “modernity” to others amidst the growing culture of consumerism. They take pride in their hard work and the electronics, new cars, and designer clothes they can buy locally at prices on par with Beijing’s shops. Their new televisions are the central focus in household gatherings at night, as they eagerly watched comedy shows, NBA games in the U.S., or the other favourite, fights of the Worldwide Wrestling Federation. “Their arms are massive,” said a 27 year-old father while comparing their width to the size of his infant son held in his other arm. He looked up intensely and added: “tai banza!” A seldom-used colloquialism, the expression essentially means ‘so awesome.’

Despite the differences in perspectives between older and younger farmers, the hydrologic effects were where farmers across all the generations saw eye-to-eye with the restoration plan. All agree that the prevalence of rubber trees has dire effects on Xishuangbanna’s water. As a woman from Chengzi put it, “We used to have many forests and many streams. Now we have many rubber trees, but not even enough water to wash our clothes.” These perspectives were
shared across genders. In general, though, farmers in their forties and older had stronger opinions and more to say about rubber trees’ deleterious effects on weather, streams, forests, and agriculture than younger generations. An elder from Mannasan stressed, “Before rubber, I drank from the river, ate from the river…Then the river became too muddy so we needed a well. Now that does not have water and the streams are dried out...The effects [of rubber] are huge.”

The dominant theme that emerged from interviews was the severity of hydrologic changes in Xishuangbanna from rubber cultivation. Farmers reported the following problems: losing entire streams; greatly decreased flows in others, even in the wet season; drier crop lands below rubber plots; shrunken reservoirs; soil erosion; polluted ground and river water; far less wild fish; and greater variability in river flows after storms. Farmers believed that soil changes start with the large terraces, often on steep slopes, that are dug for rubber trees. According to scientists, the soil is further affected by both desiccation—especially in the late dry season around the vernal equinox when rubber trees increase root water uptake to allow bud break and leaf flushing⁴ (Guardiola-Claramonte et al. 2008: 20)—and surface erosion from high run-off during summer rains (Wu et al. 2001). Additionally, above the rubber trees’ thin canopy, fog dissipates faster than over natural forests, leading to more direct sun, higher temperatures and further effects on soils (ibid.). This difference was clear around the village of Mannasan where the Luosuo River valley narrows; one side of the river is a nature reserve.

⁴ According to Guardiola-Claramonte et al. (2008: 20), “The causes of bud break and flushing of certain tropical species during the dry season (a phenomenon referred to as the leaf flushing paradox; Rivera et al., 2002; Elliot et al., 2006) is under debate (Renner, 2007)….rubber flushing is independent of climate conditions and is primarily associated with photoperiodic induction (increase in day-length) and the availability of deeper subsurface water.”
and the opposite is covered in rubber trees. Even though the natural forest—on an east and southeast aspect—received sunlight earlier, it retained its fog blanket for three hours longer than the rubber side. Mannasan was the only place where I saw this discrepancy. However, no other villages I visited have similar biogeographic conditions, with natural forests directly on the opposite side of their rubber plots. Wu et al. (2001) attribute Xishaungbanna’s decrease in daily fog hours to rubber trees.

Outside of Xishuangbanna, other areas in Yunnan Province without rubber trees had also been experiencing droughts in 2009-2010 (Qiu 2010). Therefore, these regional weather patterns presumably also influenced the decreased rainfall within the prefecture. However, farmers were adamant that the drought was exacerbated in Xishuangbanna by the abundance of rubber trees. Farmers stressed the large ground water requirements of the rubber trees in order to produce latex, and that the effects of the water demand had become especially evident within the previous five years.

Importantly, farmers in every village referred to the disappearance of streams as clear evidence of rubber trees inducing water scarcity. At least nine villages I visited have responded to increasing scarcity with new infrastructure projects including wells, pipelines and reservoirs that require significant financial investment. Within the past five years, for example, Chengzi built a new well and pipeline; Mannasan built an additional well, pipeline and reservoir; and Manlun ran a pipe 10 kilometres to the nature reserve. Despite the responses to greater water scarcity, conditions have reached the point where eight villages I visited
have even needed to restrict water use and limit to the evening when villagers can tap the main water line. For farmers, this is evidence of environmental change and its effects on their lives.

Yet the social effects of water scarcity can also extend beyond the household level to cause tensions at larger scales. For example, Chengzi farmers expressed animosity towards Daka villagers whose upstream rubber plots they claim to have exhausted the water supply that the village of Chengzi relies on. One Chengzi man added, “[The Daka villagers] don't care about us. They each have five times more rubber land than us and still want more.” In the summer of 2010, in fact, Chengzi farmers had to ask for water from other villages to bring back in their tractors. Daka farmers I asked about Chengzi’s water scarcity responded that attributing it to just Daka villagers was senseless because Chengzi and other Dai farmers’ rubber trees are in the same watershed. Additionally, the village of Manlun was upset that their streams had run dry after Jinuo farmers planted rubber in their headwaters. But as the Manlun village head described it, “There’s nothing we can do about the situation anyway. Although we can almost see them from here, that land is in a different county; it’s all very troublesome.” These tensions over rubber illustrate new forms of conflicts emerging in post-socialist conditions (see Verdery 1999).

Moreover, about a dozen farmers in four other villages complained about the deleterious impacts on rice paddies and crop lands from the desiccated streams originating in state rubber plantations above their lands. Although they concurred that elsewhere their own rubber trees were planted above crop lands
and also caused decreased stream flow, several farmers in Manbian, Mannadu, and Mannasan countered that the impacts were more significant from the neighbouring Sanfenchang state rubber plantation because of the age of the trees and more frequent herbicide applications. The nineteen Sanfenchang workers I spoke with throughout the three months expressed pride in their regimented methods for tending the rubber plantation and applying herbicides. The state farm workers argued their methods are ‘scientific’ (kexue de) whereas minority nationality farmers and their methods are ‘backwards.’ Nevertheless, the state farm workers also saw desiccated streams and hotter temperatures as linked to rubber cultivation.

5.3 Property Relations and Restoration Considerations

Farmers’ viewpoints on water scarcity and the abundance of dried-up streams illustrate the implications of proposed restoration corridors along streams and ridges, and between nature reserves. Some of these viewpoints were revealed through participatory mapping of land use histories while trekking in croplands and rubber plots with farmers. Land use and tenure mapping elicited rich details on socio-spatial politics through farmers’ eyes. In particular, the social relations that underlie multiple scales of land tenures emerged as a focal point of farmers’ responses to the restoration plan. The following cases illustrate these complexities and their effects on restoration considerations for farmers.
The Bo family of Mandajiu

Dynamic and complex property relations within households are central to farmers’ responses to restoration. Although de jure land titles are only issued to the head of a household, numerous de facto arrangements are made in household plots. In fact, multiple layers of family relations and traditions become enmeshed in each plot’s tenure arrangements. I highlight one family’s situation to illustrate the web of property relations that affect individual and household restoration perspectives.

Rubber cultivation for minority farmers began just after decollectivization and the contracting of land to households in the early 1980s. Agricultural extension agents and state farm personnel encouraged farmers to plant rubber on lower elevation shifting cultivation lands. Rubber cultivation is associated in farmers’ minds with these dramatic property rights transformations and the beginning of new lifestyles. The meaning of these connections has grown through new generations of family, strengthening the “inseparability of property relations and identity” (Sturgeon and Sikor 2004:3).

Five kilometres east of the village of Mandajiu, trekking with the son-in-law Aijiao up and down the Bo family’s plots of rubber trees revealed the diversity of familial relations linked to household land. Aijiao’s explanations highlighted the network of generational relations embedded in land use and the significance of these ties between land and successive generations of family. When Aijiao married into his wife’s family, his father gave him a plot of rubber trees to help support his new family. For the previous five years, Aijiao’s older sister, who had
married into a different family, had managed the plot. This same land had originally been cleared and planted by Aijiao’s father, adding to the land’s value in Aijiao’s eyes. Because his wife did not have brothers, Aijiao is the only young male in the household and he feels many pressures. His ability to bring more land into the family’s fold contributes to Aijiao’s appreciation for this land. Lastly, in thinking of arranging a marriage for his own daughter, Aijiao talked of the importance of continuing the tradition by passing the plot on to her family in the future: “When she marries, I want her new family to know I support them. This is how it was for me. Of course I want them to be happy too.” For many reasons, Aijiao and his family have a strong attachment to their land.

Personal attachment to land affects farmers’ viewpoints on restoration. Both the familial relations entwined with land and the incomes and opportunities generated from it create strong aversion to losing control over land. That the land has been worked by themselves and their elders adds to the meaning of particular plots. That the trees and land will provide plentiful income for their children and grandchildren adds to their importance. As an Akha man emphasized, “There’s no way I would sell my rubber plots; I want my children to have that income. They are the most important.” Farmers in their twenties and thirties take pride in furthering the work of older generations, while having ample incomes to care for their elders and children. The elders, although concerned about adolescents’ lifestyles, take great joy in their families’ accomplishments and the abundant opportunities for today’s children compared to before. Middle generation farmers still work their land too, and having grown up through the
poverty of the Mao era, speak highly of having their own plots of land to give their children for future incomes, a stark contrast to the past. A grandmother holding her grandson and his toy monster truck stated, “Before the Reform and Opening in the 1980s we were very poor—extremely poor. It’s all very different nowadays...Some students go to Jinghong for school. Now we have money.” To lose land would mean losing income, which for many farmers is a huge concern. In general, whether farmers are 23 or 83 years old, connection to one’s household land generates strong resistance to restoration.

**The Mannasan Hills and Plot Mosaics**

Mapping kinship relations within household plots reveals the complex property interactions that occur between households as well. Indeed, the geographies and politics of household plots and contracts yield potential obstacles to restoration plans. The diversity of plot shapes and sizes spread across hillsides is matched by diverse contracts and markets.

Throughout the 1980s and 1990s, the surrounding hillsides became divided into household plots, some according to household size and others awarded to whichever household cleared and planted rubber on a piece of land. Nowadays, the orderly appearance of endless parallel rows of rubber trees gives a sense of uniformity to the landscape. Trekking with farmers and mapping the plots revealed how patch-worked the landscape actually is in terms of household tenures. The household plots have myriad shapes and sizes, commonly around 0.33 to 0.66 hectare (see Figure 5.2). Therefore, within a potential stream corridor there can be numerous household plots. Even for farmers, the borders
between plots can be fuzzy: “different people may contest the ownership of a single object, complicating the assessment of use rights, obligations, and claims to revenue” (Verdery 1997:104). The following examples illustrate this fuzziness.

Figure 5.2  Approximate household plot borderlines on a ridge outside Mannasan. The lines were determined by hiking with farmers and having them point out the borders of their plots. Afterwards, we also reviewed sketch maps and an official topographic map\(^5\).

Borderlines are often marked by impermanent features on the landscape. The plots mapped in Figure 5.2 were distinguished at certain points by features such as wind-snapped trees and the adjacent land contours extending outward from it; streambeds; differently aged stands of rubber trees; and footpaths.

Moreover, some plot lines are contested between households. The

\(^5\) The topographic map was unable to be reproduced for this thesis.
impermanence of markers and disagreements has led to contestations between farmers over disputed claims. Tension can arise especially when farmers decide to chop down and replant a rubber plot. Differences in perceived borderlines effectively mean fewer rubber trees and less income for one household or the other. As well, downed rubber trees are also sold for furniture making and fuel wood. In 2009, disputed boundary claims between two male farmers even led to fisticuffs. Such serious results of a land dispute are not common, but the fuzzy property at play highlights part of what is at stake with restoration. As the borderline in question was in a ravine, the example shows the potential for restoration of these areas to encounter disputed claims among farmers.

The twist in this picture lies in China’s Forest Property Rights Reform of 2008, which includes demarcation of household forest plots by the state forestry bureau. For most farmers, these plots are now all planted in rubber trees. Farmers reported that state forestry agents identified property lines of household plots by walking their perimeters and using a handheld electronic device, presumably a GPS. In the spring of 2010, farmers received forest tenure certificates, linquan zheng, with contracts for 30 to 70 years. In general, farmers were indifferent to the certificates, but did say that having the certificate meant that no one could take away their land. Additionally, as some of the state-drawn borderlines ignored the underlying fuzziness of lines between household plots, I came across three instances where farmers ignored the state lines and upheld their de facto claims, such as allowing someone to continue using a piece of land delegated, de jure, to the other person.
In sum, the examples above illustrate the state’s shift towards a privatized property rights system while local, de facto relations are not as clear-cut. It is uncertain how these apparent ambiguities and farmers’ stances would affect restoration efforts, but it is evident that there could be problems related to the Reform’s land demarcation and titling. Moreover, the Reform is shifting forest land towards a private land market, yet there is neither a clear regulatory system for land allocations and contracts nor for judicial processes of grievance and redress (Xu et al. 2010: 17). Therefore, we see property fuzziness in this case in “the lack of routinized rules and crystallized practices around private property in the context of post-socialism” (Verdery 1999: 55, emphasis in original).

Land Leases and Markets

Additional forms of fuzzy property central to restoration considerations are farmers’ split-tenure contracts and burgeoning land leases. In Mannasan and other peripheral villages in Menglun Township, some households have contracted out use-rights to distant parcels of land to ethnic-Miao friends in neighbouring townships. Since these plots are too distant to manage themselves, some Dai households allow Miao friends to clear the land and grow rubber trees. The Dai still keep their de jure land titles. Dai farmers explained that these informal contracts are unknown to township officials and function without juridical oversight. Some parcels of land under de facto contract between the Dai and Miao lie within targeted restoration zones, with important implications for restoration. That is, “…because of their complex interrelations and the multiplicity of actors holding them” (Verdery 1999:104), it raises the question of whether
restoration could account for these fuzzy arrangements and the different stakeholders affected by restoration corridors, or cause further conflicts.

Farmers’ restoration perspectives are further complicated by the property relations surrounding land leases held by entrepreneurs. The surplus of land plots in some Akha and Dai households, along with the high demand for rubber trees, has led to the emergence of informal land markets in the Prefecture. Additional land plots in these informal markets stem from previous state land and village collective land. With street-side postings on telephone poles (see Figure 5.3) and flyers plastered outside the central market place, land leases are advertised openly in public. Leases are often bought by local and non-local businessmen and truck drivers, who sometimes employ wage-labourers to manage the rubber trees. They often sell the leases when advantageous.
I came across several individuals in Menglun who illustrate the situation of leases held by persons outside the local villages, although their plots share borderlines with Dai and Akha farmers’ land. For example, a Han Chinese hardware store owner in Menglun owns the leases to four plots of rubber trees totalling 40 mu. He stressed the convenience of earning rubber income with hired labourers who are also Han: “It is much easier for me to pay someone 80 yuan per day to tap and collect the rubber. Otherwise, I’ll have my wife go do it. My days are relatively easy just tending shop here.” An ethnic Bai family from northern Yunnan moved to Menglun in 2000 to establish a noodle shop. In 2005, the husband bought the lease to 10 mu of cleared land and then planted rubber trees. Having befriended several farmers from local villages, he said they will train him in tapping the trees.
Additional plots bordering Dai and Akha landscapes in Menglun Township are held by other Han Chinese that have utilized their social connections to buy leases to land. In 1999, for instance, a former state farm worker who arrived in the 1980s bought the lease for 15 mu of state ‘wasteland’ (*huangdi*) from a local state agent. The plot borders the land belonging to farmers of Manzha village. He then cleared and terraced the land and planted rubber trees, tremendously gruelling labour, and still taps the trees himself. Similarly, in Menglun some families of former state farm employees from the 1970s who stayed in the area now have sizable amounts of land. The son of one such former employee, a 33 year-old man whom local shop keepers referred to as the town drunk, has bought leases for 60 *mu* over the past decade. He boasted about his large modern-style home in central Menglun and his easy work schedule, often hiring labourers to tap his trees.

In each of these four examples above, the leaseholders’ plots of rubber trees share borderlines, ravines, or ridge tops with local Dai and Akha farmers’ land. Therefore, the land within some prospective restoration zones is held by a mixture of local and non-local leaseholders. These mixtures are important to restoration plans for their possible complications to community or household decision-making, although the level at which restoration decisions will be made is unknown.

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6 The reasons are unclear for certain state land being classified as ‘waste’, even to some state officials (Sturgeon 2005b).
**Manbian and Banana Plantations**

The farmers’ attachment to the land and rubber trees has increased due to the rise of cash crop markets and associated land use changes, particularly the conversion of lowland rice paddies to banana plantations. Han businessmen from other provinces buy leases to paddy land for a set number of years and bring in Han labourers to run the operations. The extent of banana cultivation in Xishuangbanna is surprising (see Figure 5.4). In fact, on several occasions farmers insisted that one third of rice paddies in Xishuangbanna have been converted into banana plots. Sturgeon (2006:18) explains that the spread of banana cultivation is beyond mere market demand, as policies in Guangdong Province that emphasize planting grain can lead banana entrepreneurs to Xishuangbanna to search for new land.
The village of Manbian illustrates the significance of the bananas to rubber cultivation and forest restoration. In 2005, the village head at the time leased the village’s rice paddies to a Guangdong entrepreneur for three years. As rice prices were low, the leasing of paddies was considered advantageous. Yet due to the extent of soil changes, the farmers are now doubtful that they will be able to grow rice following the banana trees. Contracts with the outside entrepreneurs are commonly renewed to avoid this problem. The banana plantations require extensive rows of meter-deep trenches and cause soil and water contamination from frequent chemical inputs. Distaste for banana plantations was common in nine villages I visited. Farmers in Chengzi, Man’e, Manbian, Mannadu, and Mengpeng pointed out that banana plantations disrupt local drainage patterns.
and affect adjacent rice paddies and other crops. A woman from Mengpeng said that sometimes her vegetables die from the banana chemical sprays.

Other scales of power relations also played out in relation to bananas. The banana plantations and lease contracts highlight the effects of uneven power relations between farmers and village heads, as the latter can use their status to control lease decisions for their own gain. Dozens of farmers expressed animosity towards former village heads in Manbian and Mannadu for contracting out village collective land for banana contracts.

The other importance of the bananas to the restoration proposal lies in farmers’ increased attachment to rubber trees and reliance on rubber incomes resulting from loss of paddy land to banana contracts. For example, Mannadu and Manbian no longer gain income through the sale of rice, but rather have to buy additional rice to supplement their harvest. Since 480 mu was leased to a banana boss from Guangdong, Mannasan households now buy almost all their rice because they only have small areas of paddy land. Increases in the price of rice add not only to their expenses, but also to farmers’ regret for the loss of paddy lands. A group of eight Manbian women spoke fervidly about their loss. As one of them remarked, “Before those bananas, we had plenty of rice. Now it’s all very different...We want to grow rice again.”

Significantly, this loss of resource access affects farmers’ cultural identities. The long-held practices of paddy farming and associated traditions comprise a large part of Dai culture and community. Although paddies are divided between households, to a large extent rice farming is still a collective
endeavor. Only a few tasks are done separately. Plus, groups of households hold celebrations after the completion of planting everyone’s fields, and after the collective harvest they gather again. In a similar vein, according to most farmers, the best homemade alcohol comes from the local rice. Other ethnographic details illustrate the centrality of rice cultivation in cultural identities as well. On numerous occasions in interviews Dai farmers invoked a saying that essentially means: “only if there are paddy fields (tian), there will be people.” Furthermore, elders in Mandajiu stressed the importance of rice paddies in Menglun for the historical significance. The area was originally settled by their ancestors who were sent to produce more rice for Xishuangbanna’s king at the time. According to the elders, central Menglun’s broad valley is ideal for paddy agriculture and abundant harvests (see Figure 5.5). Lastly, several farmers at different points expressed that Xishuangbanna’s Dai are named the ‘water Dai’ (shui Dai) precisely because of their wet-rice agriculture.\(^7\)

\(^7\) There are different subsets of Dai outside Xishuangbanna.
Many Dai farmers saw the bananas and conversion of paddy lands as an affront to their livelihood, land, and cultural meanings in rice. The significance of this process relates to its effects on forest restoration perspectives. The erosion of identities related to rice is being replaced—or at least paralleled—by farmers’ heightened sense of identity gained from their involvement and success in rubber cultivation. Indeed, these notions of identity contribute to farmers’ reluctance to forfeit rubber trees for restoration.

The Menglun Nature Reserve and Peasant-State Relations

This section continues to show how property relations offer insights to obstacles facing the restoration plan. I build on Verdery’s (1999) assertion that property is about boundaries between self and non-self. In Verdery’s sense, this notion of self applies to the community one is a part of, along with self as an individual. In Xishuangbanna, the property relations and boundaries entailed in state conservation ideology, nature reserves, and the proposed extension of conservation space underscore notions of selfhood among farmers. Indeed,
farmers see themselves and their land uses as quite separate from the state conservation landscapes and agenda. As I explain below, notions of selfhood in Xishuangbanna encompass important elements of personal and social identities: kinship and community; literacy and education; and livelihood and labour. The nature reserves, prospective inter-cropped rubber trees, and restoration zones are particularly vivid arenas for illustrating the effect of the boundaries between self and non-self on farmers’ restoration perspectives.

The Menglun Nature Reserve occupies the centre of Menglun Township. Nine villages I visited have land sharing a border with the reserve. In general, farmers view the reserve positively because it protects the area’s remaining primary forests. Villages with water sourced in the reserve emphasized its importance for water security. Furthermore, many farmers said that the government has done quite well in protecting the reserve. On several occasions, farmers spoke of an incident where farmers from a village in Yiwu Township to the south of Menglun were jailed for cutting trees in a national forest. Dozens of Menglun farmers said that the reserve’s protection prevents the forests from being cleared to plant rubber. Expressing a view shared by other farmers as well, one man stated: “Of course we commoners can’t go there; it would be ruined.”

In addition, many farmers said they are not allowed to enter the reserve, and only scientists and state agents have access. Although some NTFP harvesting still takes place in the reserve, villages’ community forests are mainly used for NTFP harvesting, and for the most part farmers stay out of the Reserve. It is relevant to note that the word ‘reserve’ in Mandarin actually translates as
‘protection district.’ And even when speaking in Dai, my translators used the Mandarin form because of the word’s absence in Dai. From interviews and village stays it was evident how separate farmers saw the reserve from their land and lives. Farmers said that the reserve belongs to the state: “shi guojia de.” It belongs to the state, however, not in the public sense, but rather that it is managed by the state. The crux of the issue lies in this distinction. For farmers, environmental protection is something done by the state. This separation is arguably a product of the state’s efforts over at least four decades to divide the landscape of Xishuangbanna into segregated spaces for ethnic minorities, environmental protection, and state rubber farms (see Sturgeon and Menzies 2006). This divided socio-spatial landscape perspective is reproduced in farmers’ own eyes. The state’s ‘discursive weapons’ (Blaikie and Muldavin 2004: 537) have been internalized by the farmers and play into such divisions: farmers interviewed frequently describe themselves as backward; illiterate; lacking culture, knowledge, and education; and having low quality.

Thus with farmers associating the nature ‘protection district’ with state personnel, scientists, and a high degree of knowledge, the nature reserve is bound to be seen by farmers as beyond the boundary between self and non-self. Such a boundary is important to recognize because of the obstacles it creates to additional state environmental protection projects. To a large extent, farmers see themselves and their land as beyond the scope of state environmental conservation. The potential loss of rubber trees and land underscores the meaningfulness of these resources and the identity derived from them. As one
middle-age woman put it, “Rubber is most important; we still don’t have much development.”

In a similar vein, the restoration plan for intercropping rubber trees with tea, coffee, and medicinal plants also faces significant obstacles from the viewpoint of farmers. Intercropping rubber trees with tea was seen as infeasible due to tea leaves being unable to mature properly under the canopies of mature rubber trees. Below Daka Xinzhai there were several rows of tea growing between young rubber trees (see Figure 5.6), but the farmers said when the rubber trees’ crowns fill in after a couple years the tea leaves cannot mature and will be worthless. This was the only village where I saw or was told about tea below rubber trees. Farmers also objected to the idea of growing coffee because they are unfamiliar with it. One middle-aged man remarked, “I’ve never seen coffee. I don’t drink coffee. How would I know how to grow it?” Other common responses were that coffee is for westerners and that China lacks a market for it.
Furthermore, there were objections to the cultivation of medicinal plants between rubber trees, and intercropping in general, stemming from rubber farming practices. The exception is pineapple, which can be planted in plots of young rubber trees. For one to two years after planting new rubber saplings, some households grow pineapples for supplemental income. Nevertheless, pesticides and herbicides are broadly applied in rubber plots. Farmers stressed their importance and that these chemicals would interfere with other crops. The understory of rubber plots is important to be kept clear for several reasons. The pervasiveness of bugs and especially mosquitoes are a huge annoyance when tapping rubber because they are attracted to farmers’ headlamps and faces.
Farmers thought that intercropping would harbour bugs and rodents. Another objection to intercropping is that it would decrease the available water for rubber trees. Farmers in nearly every village emphasized the huge water demand of rubber trees and that limiting water supply would decrease latex production and shorten the long-term time span that trees can be tapped. Lastly, farmers’ existing labour requirements from rubber and other crops also contributed to objections against intercropping. As one Dai woman stated, “We minority nationalities have other labour too. That’s already enough.”

Furthermore, farmers were confused over the proposal to intercrop rubber trees because scientists and state farm personnel look down upon their rubber farming practices. For example, expressing doubt at Dai farmers’ capacity to contribute knowledge for planning ecological restoration, one scientist at XTBG added, “They don’t know what they are doing. They’re even cutting down the forests on their holy hills.” Likewise, state farm workers frequently noted that Dai households chaotically cut and manage (luanka luanfa) their rubber plots. Dozens of Dai farmers also invoked this same phrase in describing pejoratively their own practices in contrast to the state farms. The clear and widely spaced rows in state plantations are seen as the optimum model for rubber cultivation: quite the opposite from intercropping.

In Yanuo, a village in the proposed biodiversity corridor between Menglun Nature Reserve and Mengyang Nature Reserve to the north, Jinuo farmers without rubber trees also expressed confusion over state projects. Several farmers and the village head separately described how state agents repeatedly
told the village to build new, modern-style houses with their higher incomes from increased tea prices in the early 2000s. However, in recent years the village has been told to only build their traditional-style houses because they look better for tourists. Additionally, several grandmothers contended that the government would not care about the village’s input in creating the corridor. One reason was, as they put it, “We are common people.” A statement common in interviews in almost all the villages, the comment poignantly illustrates the politics of boundaries between self and non-self that saturate the socio-spatial landscape targeted by the state’s restoration plan.

5.4 Conclusion

Chapter 3 argues that property relations and resource access offer an analytic lens to view the intersecting levels of politics at play, and to sort out how these multiple sites affect prospective forest restoration. The cases above demonstrate this capacity through looking at three levels. First, within households we saw how kinship relations become embedded in rubber plots and evoke strong connections with the land. Second, at the village level there are important forms of fuzzy property that present complications for restoration: conflicting claims between households; split tenure contracts; and land leases. The third level consists of the extra-local relations: banana plantations that affect notions of cultural identity related to losing rice paddies and increasing attachments to rubber cultivation; and state conservation ideologies, practices, and plans that farmers stand apart from. Overall, this chapter also demonstrates the importance
of ethnographic research with local resource users for understanding ecological changes and land use politics, a point elaborated in the next chapter.
6: THE IMPORTANCE OF A POLITICAL ECOLOGY APPROACH IN RESTORATION ECOLOGY

We will also be aiming to explore the boundaries between traditional restoration science and other disciplines. We are currently in a time of flux when traditional or “normal” science is being seen as not sufficient on its own to tackle the complex and pressing environmental problems of today.... The importance of inter-, multi-, and transdisciplinary studies is increasingly emphasized, and the emergence of “postnormal” science as a complementary approach to more traditional methods presents challenges and opportunities, which need wider discussion. Richard Hobbs (2005: 241), editor-in-chief of Restoration Ecology

Ecological arguments are never socially neutral any more than socio-political arguments are ecologically neutral. David Harvey (1996: 185)

Restoration ecology faces significant theoretical, practical, and political challenges. While often conceived as a science, restoration ecology is better understood as a set of practices informed and conditioned by social and ecological contexts. This chapter makes the case for how political ecology can inform the theory and practice of restoration ecology through placing power relations and history centrally in understanding ecological changes, and through bottom-up processes for participatory approaches to restoration. As the need for and scale of ecological restoration continues to expand (Suding 2011), it becomes increasingly important to examine the effects of restoration practices and improve the theory and methods used. Despite restoration ecology’s increasing attention to the field’s need for conceptual and technical development (Hobbs 2005; Egan et al. 2011), an effective approach remains unclear. The point of this chapter is to rethink the theory and practice of restoration ecology through a political ecology perspective. To this end, I describe an approach for
working towards political restoration ecology. This chapter highlights a successful case of a village’s forest restoration to illustrate the kinds of insights gained from starting projects by understanding and prioritizing local land users’ perspectives.

6.1 Restoration ecology revisited

In this section I interrogate the assumptions, framings, and practices of restoration ecology. I argue that restoration ecology is limited by (1) its framing as a science, (2) its assumption of the separation of human and natural systems, and (3) its expert-driven, top-down approach that excludes crucial perspectives. Examining these aspects of restoration ecology in theory and practice opens up the space for new approaches.

First, restoration ecology, according to Vaugh et al. (2010: 1), is “the scientific study of repairing disturbed ecosystems through human intervention.” Higgs (2005: 159) argues that restoration ecology consists of “the suite of scientific practices that constitute the emergent subdiscipline of ecology and comprises what we consider typical of a contemporary natural science: hypotheses, conjectures, testing, experiments, field observations, publications, and debate.” However, overemphasizing the scientific basis of restoration ecology risks obscuring the importance of place-based knowledges and practices that can inform a more effective restoration strategy. For instance, the search for universal principles and methods of restoration ecology implied in a more strict ‘scientific’ definition may eschew critical local knowledges and practices of restoration in favor of ‘scientific practice’. The fact that the science of ecology is strongly rooted in western ways of knowing may disregard other knowledges and
be culturally inappropriate in some instances. Moreover, a rigid scientific restoration ecology seeks to create reproducible mechanisms for achieving desired outcomes. The limitation of this approach, however, is that each project is site-specific, and therefore unique to the site and local society, as well as structured by national and global forces. Indeed, the goals, objectives, and practices of restoration are influenced by social, political, and historical contexts. As such, restoration ecology should be rethought as a set of practices that are negotiated within these specific contexts.

Second, despite this inherent social context, restoration ecology is based upon a belief in the separation of human and natural systems. As restoration ecology is underpinned by ecological theory, it is important to realize in this lineage that “ecological research has generally focused on the study of nature in the absence of humans” (Burke and Mitchell 2007:349). In addition, Robertson and Hull (2001: 971) argue that ecological science has tended to “ignore the historical fact that people are a part of nature.” Similarly, Higgs (2005: 163) contends that restoration tends to “systematically exclude people from our understanding of ecological history.”

The artificial separation of human and natural systems has significant conceptual and practical effects on restoration ecology. To this end, Harvey (1996) underscores the inseparability of humans and nature and shows that the design of ecological projects reflects the social systems which produced them. A dualistic view of nature as separate from humans effectively excludes sociocultural and political economic considerations in restoration ecology. Yet
such exclusions limit the durability and success of restoration projects (Geist and Galatowitsch 1999; Higgs 1997). Effective restoration, Higgs (1997: 339) argues, “entails negotiating the best possible outcome for a specific site based on ecological knowledge and the diverse perspectives of interested stakeholders.” In sum, the dualistic perspective in restoration ecology ignores other factors that are as important as biophysical components in designing and implementing restoration projects. As Cairns and Heckman (1996: 170) claim, “social realities are often as important to restoration plans as scientific theories and predictions.”

Third, restoration ecology has predominantly emphasized expert-driven, science-based methods (Higgs 2005), also referred to as a top-down approach. At best, this approach produces mixed results. The examples presented in chapter 4 on China’s Sloping Land Conversion Program (SLCP) and Vietnam’s Program 327 and 5MHRP illustrate the socio-political effects on farmers from top-down restoration. In addition, the conflicts surrounding the projects in Cook County Illinois Forest Preserves and The Nature Conservancy’s preserve in Florida illustrate the effects of restoration devoid of participatory planning and management (Egan et al. 2011).

However, as illustrated by the three cases of successful restoration in the theory chapter, in the past decade there have been advancements in integrating socio-cultural goals and participatory planning strategies into restoration projects. Such efforts also correspond to similar prescriptions from the core of restoration ecology, which points to the field’s need for a broadened view and
interdisciplinary approaches. For example, *Restoration Ecology*’s editor-in-chief Hobbs (2005: 241) states:

What exactly constitutes “good” science means different things to different people, and we need room to explore differing approaches, which may not fit neatly into the standard experimental and observational scientific methodologies... Part of this is recognizing the need to be broad in our definition of what can be “included” in Restoration Ecology. As well as the technical aspects of the discipline, there are many philosophical, social, and other more humanities-based arenas that we need to consider. Inclusion of contributions from such fields may be challenging to more natural science focused researchers but, on the other hand, has the potential to contribute greatly to the conceptual and theoretical development of the discipline.

In addition, Bliss and Fischer (2011) put forward the first published call for applying political ecology to the restoration of ecosystems. They assert that a political ecology perspective emphasizes the importance of power relations among numerous actors in restoration, illustrated by a case of restoring oak savannah landscapes in Oregon’s Willamette Valley. Importantly, Bliss and Fischer (2011:140) state that attention to power relations in political ecology raises imperative questions for ecological restoration: “Who determines what ecosystem is in need of restoration? Whose values, histories, and traditions are privileged, and whose are not?....Who has rights or claims the land to be restored? How will local or traditional access patterns be affected?” Indeed, these are salient questions, which resonate with the problems pointed out by restoration ecology scholars above. Moreover, the questions challenge the trend in restoration for top-down decision-making based on expert knowledge. Bliss and Fischer’s (2011:142) recommended framework for reformulating ecological restoration, however, merely consists of three theoretical concepts—capital, community, and resilience—for “exploring the relationship between the
restoration of ecological and social systems.” While such concepts are important, restoration ecology can be reoriented more effectively with a political ecology framework.

Despite these efforts to advance the discipline, two areas remain minimally addressed in restoration ecology: (1) how to illuminate multiple perspectives towards restoration projects; and (2) the importance of history and power relations in understanding socio-natural dynamics. Political ecology provides a framework that addresses these shortfalls, and it also speaks to the conceptual and theoretical development of restoration ecology called for within the discipline.

### 6.2 Lessons from Political Ecology

Political ecology offers restoration ecology a critical understanding of historical, cultural, and political contexts that underlie restoration processes. This focus directly corresponds to the needs of restoration ecology as pointed out by the scholars above. Political ecology fills the gaps in restoration ecology through its focus on localized studies and ethnographical research based in multiple scales of power relations. Historical and cultural contexts matter in restoration in that projects do not take place on blank slates. Landscapes and resources contain meaning and value for people who depend on them. These interdependent meanings develop and change through time. Therefore, the history and culture of a locale is crucial to understand for designing and maintaining effective restoration projects.
Moreover, power relations matter in restoration. Power relations in this instance are shaped by the historical and cultural context. How restoration goals are defined and who defines them are powerful actions. Moreover, restoration involves the control of resources and people, clearly political domains. As such, external imposition of restoration programs can be problematic. The process of restoration experts coming in with “scientific” notions of what is best for the local environment presents a clear disjuncture with Higgs’ (1997: 339) definition of effective restoration: “negotiating the best possible outcome for a specific site based on ecological knowledge and the diverse perspectives of interested stakeholders.”

Disregarding grassroots perspectives has significant potential effects on restoration ecology. The top-down approach to restoration ignores the agency of local land users, their knowledge, and their moral economy. Following Scott’s (1976) formulation, the moral economy is a community’s “social system of mutual assistance…” (Robbins 2004: 21). As shown below, acknowledging these capabilities and systems would address some factors that critical restoration scholars point to as necessary for successful restoration (Garibaldi and Turner 2004; Higgs 1997).

Indeed, restoration ecology would be more effective through improving land users’ control over the restoration process. However, conceiving restoration as a ‘science’ allows experts to disregard local land users and their knowledge. Restoration planning and implementation should be a participatory process. Instead of restoration science, land users should be the starting point for
negotiating the goals and practices of restoration ecology and if there should be restoration at all.

Political ecology’s bottom-up approach aligns with the practice of participatory projects. Ethnographic inquiry, for instance, speaks to the need for understanding local communities’ sociocultural relations and the economic contingencies of restoration, which is necessary for successful restoration (Garibaldi and Turner 2004; Higgs 1997). The benefits of local-level research for revealing these socioeconomic aspects for restoration are supported in Neumann’s (1992:88) view that “the [political ecology perspective] moves the investigation upward and outward from the position of the land user, allowing the salient social and economic factors to emerge ‘organically’ within particular situations.”

Furthermore, deciphering the power relations at play can elucidate the diversity of stakeholders, perspectives, and potential conflicts. Examining these issues at various temporal, spatial, and administrative scales reveals their interactions and effects on socio-ecological changes, thereby providing numerous conceptual and practical insights for restoration ecology. I illustrate these points below with an empirical example.

6.3 Guanniu Village

Overlooking Burma about five kilometres to the south, the Akha village of Guanniu sits at 750 masl on the mid-slope of a 1000 masl ridge. Broadleaf evergreen forests cover the slopes directly above the village (see Figure 6.1), a
stark contrast to the adjacent rows of endless rubber trees extending all around. In total, 87 families live here with incomes primarily derived from rubber cultivation. In 1995, the village collectively decided on and implemented a forest restoration project.

![Figure 6.1 Guanniu community watershed forest. The afforested area is beyond the top-right ridgeline.](image)

For the five years before the project, Guanniu was experiencing increasing water scarcity in the dry season due to decreased stream flows. In interviews, farmers reported that the water scarcity brought the village together to address the problem. The result was a collective decision to plant trees on 380 mu (25 ha) of agricultural land under household tenure in the upper watershed above their community forest. This area was the source of the village’s streams, and the decision placed the afforested land under village protection against future clearings. At the time, adjacent lands were quickly being planted in rubber trees, which farmers saw as affecting water supplies downstream. In fact, about 20 percent of the upper watershed, or roughly 76 mu (5 ha), had already been
planted in rubber trees that belonged to six households. These trees were cut down for the project. Across the 380 mu several species of bamboo started the forest regeneration. The quickly growing bamboo sheltered subsequent larger tree species and over ten years the forest canopy filled in through natural regeneration.

The village’s 69 other households pooled funds to compensate the six households whose land was then transferred to the village collective. The 69 households each incrementally gave 2,000 yuan and the six households losing land received 1,200 yuan per mu of rubber trees. The remaining funds compensated households for their 300 mu not planted in rubber trees.

Guanni farmers credited the project for the water flow in present dry seasons. Guanni also pooled labour over the last decade and built two small reservoirs (about 30 cubic meters) above the village to store their forest’s stream flow and run-off. Farmers expressed how much it meant to have this water to wash clothes. The village took pride in the restoration project, its success, and their community. Several farmers knew of villages nearby, including some in Burma, which were experiencing water shortages of increasing duration.

The interesting twist in the Guanni story is the attention garnered from the provincial and prefectural governments as a result of the forest restoration project. In the summer of 2009, an entourage of SUVs full of officials from Kunming and Jinghong visited Guanni with television film crews to broadcast the success of the forest restoration and protection. With much of Yunnan in a drought and suffering from water scarcity, Guanni’s ingenuity and water supply
were highly touted. Ironically though, the officials made it seem as if they had contributed to the project. In fact, according to the Guanniu village head, the village was denied aid by the prefecture to help compensate households who forfeited resources for the project. The rejection of help had coloured Guanniu farmers’ views towards the prefectural government, and thus the visit by the officials in 2009 was met with mixed feelings. It was satisfying for them to get recognition and be on television, but at the same time, farmers doubted if the government actually cared about them. In our discussions, farmers’ predominant reaction to the official hoopla was the all-too-common, terse reply to almost any sort of controversy in China: *mei banta*—there is nothing that can be done about it. From their viewpoint the prefecture government does not genuinely care about their welfare, contributing to their increasing lack of trust in the government.

In general, what came across as more important to the farmers was their own capacity to address resource conservation and compensation among themselves. Such a moral economy is a key part of the village community. Mutual assistance also helps farmers in tough times. Certain Guanniu households have far less land and fewer rubber trees than others because before the price of rubber began to skyrocket in 2003, some farmers in financial trouble had sold much of their land to Han state farm workers from the state rubber farm that abuts Guanniu. The same state plantation had taken over sizable tracts of land in earlier decades that Guanniu and neighbouring Akha villages had traditionally used. Several Guanniu farmers expressed disrespect for
these workers and their predatory practices. Nonetheless, fellow villagers have helped each other in times of trouble. Their camaraderie was quite impressive.

6.4 Recasting restoration ecology

My point here is to highlight one community’s experience that illustrates important political ecological insights relevant to restoration efforts. First, it shows the benefits of ethnography for understanding one locale’s nature-society relations and how these shape their land use. For example, on-site interviews and trekking with farmers revealed how decreased stream flows amidst regional political economic and market changes led a community to restrict deforestation and increase forest cover. This approach has clear value for setting up participatory processes and effective restoration. Second, from this case we see multiple scales of power relations at play. The false claims of the officials contribute to farmers’ distrust of the prefecture and provincial governments. Additionally, there are long-standing power dynamics between the workers from the neighbouring state rubber farm and the Guanniu farmers. Third, the case reveals the effectiveness of a grassroots project. The moral economy involved highlights the agency of farmers to address deleterious ecological change.

Moreover, the Guanniu case illustrates the kind of information important for future restoration projects using bottom-up analyses of land users’ social relations, historical processes, and nested scales of political economy. Such insights are by no means limited to Guanniu. Chapter five demonstrates related land use and resource access politics in other villages. Farmers’ perspectives reveal a wide range of obstacles and opportunities significant to the prefecture’s
restoration plan. On the one hand, for instance, inappropriately low compensation schemes in the past fuel farmers’ scepticism towards state reimbursement for future losses in income. Chengzi farmers felt cheated in a deal in which they lost agricultural fields to the Xishuangbanna Tropical Botanical Garden’s hotel and parking lot expansion. Similarly, the village of Man’è rejected a government proposal for converting their fields into a new ‘Xishuangbanna University’ because the compensation offer was, as several farmers put it, “way too low!” Indeed, farmers in other villages also had these kinds of experiences.

On the other hand, the agency of farmers in devising solutions to local problems presents opportunities for the restoration planners to consider. In addition to the Guanniu restoration, Mannasan and other Dai villages, using collective labour, have constructed reservoirs and water lines in recent years.

The point here is to show the advantages for restoration ecology in starting with land users and working upwards through a political ecology framework. I recommend that restoration ecology be recast as ‘political restoration ecology’. Political restoration ecology entails a site-specific process that is contingent on local communities’ participation; attention to cultural and historical contexts and multi-scalar politics; and integration of appropriate science.

To elaborate, political restoration ecology does not preclude restoration ecologists. What is crucial, though, is that any outside groups that want to intervene—be it government agencies, non-governmental organizations, research institutions, or others—should start with the local stakeholders. These
groups should, as Menzies (2007:15) calls for, “make the transition from collaboration and partnership as experimental exception or concession to collaboration and partnership as the norm.” In addition, they need to conduct detailed studies into communities’ land use practices and property rights, cultural and historical contingencies, and multiple scales of political relations. Part of this process requires understanding any conflicts involved. As well, these studies must be long-term. For instance, my three months of fieldwork should not be considered long enough to adequately examine the breadth and depth of issues of a proposed project. Lastly, the science conducted should be based on what has been called public ecology, in which “scientists share with a larger community of stakeholders the responsibility and privilege of defining their research programs and constructing their knowledge, including their choice and definition of normative constructs” (Robertson and Hull 2001: 974). In sum, political restoration ecology would help achieve the conceptual development and effective restoration sought within the field.

6.5 Conclusions: the importance of political restoration ecology

This chapter centres on the ability of political ecology to improve restoration ecology. A political ecology perspective exposes the pitfalls of the top-down modus operandi in restoration ecology, policy, and management. Similar scholarship has begun to surface in academic literature, but it needs further development. Recasting restoration ecology towards political restoration ecology would advance this development.
On a broader level, this argument is significant due to restoration ecology’s trajectory. Large-scale restoration projects are taking place in Indonesia, China, the USA, and Australia; and the 2010 Convention on Biological Diversity commits to the restoration of 15 percent of degraded ecosystems worldwide by 2020 (Suding 2011). As Suding (2011: 480) argues, “[r]estoration ecology can inform management decision making and policy development in an evidence-based, adaptive, and experimental framework.” Depending on the evidence used in this framework, much is at stake for communities in these large-scale projects. Their resource access and livelihoods could be compromised. Also, transformations in targeted landscapes could disrupt customary livelihood and cultural practices, affecting social relations and identities as well. Overall, these risks demonstrate the importance of political restoration ecology to improving prospects for restoring ecosystems.
7: CONCLUSION

This thesis has explored how ecological restoration is embedded in political, cultural, and historical contexts. My discussion of the proposed restoration plan in Xishuangbanna analyzed fieldwork findings using a theoretical framework drawn from three main fields: restoration ecology, political ecology, and property relations. One of the goals of my research was to understand how the restoration project would be affected by historical, socio-cultural and political-economic factors. Another research goal was to assess how farmers’ perspectives could contribute to the restoration plans. My research shows that in relation to the restoration plan, the farmers’ perspectives reveal important considerations, which stem from the tumultuous history behind their rise from poverty, and the state policies that shape land use and peasant-state relations.

In chapter three, I traced the historical background relevant to the restoration proposal via three periods: the Mao Zedong era of 1949 to 1977; the Deng Xiaoping era of 1978 to 1997; and the post-Deng era from 1998 to 2010. Understanding state policies and changes in farmers’ social and physical landscapes during these three periods illuminated the layers of politics that underlie current state-peasant relations in Xishuangbanna.

Chapter four examined the three bodies of theory used in this research. I first discussed the science and practice of restoration ecology and its shortfalls in not explicitly addressing politics. I argued that politics are inherent to ecological
restoration because of the inseparability of humans and nature (Harvey 1996) and the implications for resource access and control. A dualistic view of nature as separate from humans effectively excludes socio-cultural and political-economic considerations in restoration ecology. How politics and power relations play out can have important effects on projects and stakeholders. I then discussed how political ecology could provide an effective tool set for advancing restoration ecology through a focus on historical analysis, changes in nature-society relations, and power relations at multiple scales. Lastly, selected theory on property relations showed that analyzing resource access and control reveals how these dynamics play out at multiple scales. Drawing from studies on post-socialist property, I also showed how property relations are embedded with notions of cultural identity.

In chapter five, I examined farmers' views on socio-ecological changes resulting from rubber cultivation and other land use changes. I looked at property relations at three levels—household, village, and extra-local—to illuminate how kinship, identity, village politics, and peasant-state relations affect farmers' environmental concerns, livelihoods, cultural values, and attitudes toward restoration. First, within households this study revealed how kinship relations become embedded in rubber plots and evoke strong connections with the land. Second, at the village level there are three important forms of fuzzy property that present complications for restoration: conflicting claims between households; split tenure contracts; and land leases. The third level consists of the extra-local relations: externally-run banana plantations that affect notions of cultural identity.
related to losing rice paddies and increasing attachments to rubber cultivation; and state conservation ideologies, practices, and plans that farmers stand apart from. Overall, this chapter also demonstrated the importance of ethnographic research with local resource users for understanding ecological changes and land use politics.

In chapter six I showed how political ecology can inform the theory and practice of restoration ecology through placing power relations and historical processes centrally in understanding ecological changes, and through bottom-up analyses for participatory approaches to restoration. I highlighted a successful case of a village’s forest restoration to illustrate the kinds of insights gained from starting projects by understanding and prioritizing local land users’ perspectives. Lastly, I argued for the need to recast the theory and practice of restoration ecology through a political ecology perspective, and described an approach for working towards political restoration ecology. This new approach entails a site-specific process that depends on local communities’ participation; attention to cultural and historical contexts and multi-scalar politics; and integration of appropriate science.

Overall, this thesis provides two major contributions. The analysis of farmers’ attitudes toward a proposed restoration project based on a combination of ethnographic and rural development methods presents a new case of post-socialist property transformations, one that responds to Verdery’s (1999: 76) call for “ethnography not just of the transition but in the transition” (emphasis in original). Second, this thesis describes a new approach to restoration that is
supported by two empirical examples. The first, and most important, is an analysis of a proposed restoration project through the viewpoints of local stakeholders. This analysis places cultural, historical, and political contexts at its centre. The second is a case of a restoration project initiated by rural community independent of outside funding and advice. In conclusion, I suggest that analyses such as these, and approaches to restoration that incorporate aspects of political ecology are growing in importance as the momentum of socio-ecological changes increases globally.
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