DECENTRALIZATION OF FOREST MANAGEMENT IN SOUTHWEST CHINA

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Abstract

China's decentralization has been recognized internationally, as it has arguably made significant contributions to rapid economic growth and social development in the past three decades. However, the impact of decentralization on resource management is more ambiguous and less studied. Given the largely negative environmental outcomes of economic growth, it is critical to ask why decentralization has not fostered environmental sustainability in China, even as it has facilitated socio-economic development.

This research aims to improve theoretical and empirical understandings of natural resource decentralization by taking forest decentralization reform in China as a case. Using both qualitative and quantitative methods, it examines the effects of decentralization on forest management as well as the interactive processes between policies and local institutional dynamics which have shaped decentralization and conditioned its outcomes. By an interdisciplinary strategy, the study employs a multi-scale approach that includes the collection of data from a wide range of involved actors extending from the central government to local communities and from multiple sectors to generate a holistic picture of forest governance in China.

From the research findings, it is clear that forest decentralization in China has been established in law but not in practice. Governance reforms set up a wide range of governance constraints which limit downward accountability and sufficient power transfers to lower-level administrative bodies. The research also argues the critical role of the local state, which plays not only mediator role between state and society, but also struggles with the central state for power. Meanwhile, the exercise of knowledge-based power in the form of scientific forest management undermines the possibility of potential power transfers to local people. These findings carry important implications for policy and further research on decentralization in theory and practice.

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List of acronyms

CBNRM	Community-based Natural Resource Management
CNY	China Yuan
DBH	Diameter Breast Height
FAO	Food and Agriculture Organization
GIS	Geographic Information System
GPS	Global Positioning System
ICRAF	World Agroforestry Centre
LULCC	Land Use and Land Cover Change
NFPP	Natural Forest Protection Program
NGOs	Non-governmental Organizations
NTFP	Non-timber Forest Products
PRA	Participatory Rural Appraisal
SFA	State Forest Administration
SLCP	Sloping Land Conversion Program
SPSS	Statistics Package for Social Sciences
USD	United States Dollar
WRI	World Resource Institute
WB	World Bank

1USD = 6.5 CNY

Chapter 1

Introduction

Over the last two decades, decentralization[1] has been promoted as a policy to improve the effectiveness and efficiency of natural resource management (WRI 2003, Agrawal and Ribot 1999). Developing countries' governments have undertaken different forms of decentralization, leading to variable processes and outcomes in settings characterized by different political, social and economic conditions (Ribot and Larson 2005, Larson and Soto 2008). Understanding of the variation in decentralization processes and outcomes remains limited, partly due to the underdeveloped state of theory on decentralization in natural resource management (Tacconi 2007). In particular, the theory fails to consider the dynamics of governance occurring at multiple levels and the particular complexities of natural resource management. Current work seeks to incorporate attention to the multiple dimensions of governance activity into analysis of decentralized forest management.

China's decentralization has been recognized internationally as it has created rapid economic growth and social development in the last three decades (Zhang and Zou 1998, Lin and Liu 2000, Lin et al. 2005). The impact of decentralization on sustainable resource use and environment conservation is much more ambiguous and less studied (Xu C.J. and Ribot 2004, Jiang 2006). Given the largely negative environmental outcomes of economic growth (e.g. Smil 1984, Rozelle et al. 1997), it is critical to ask why decentralization has not fostered environmental sustainability in China in the same way as it has facilitated socio-economic development. The dynamics of China's forest governance and associated processes are poorly understood. There is an urgent need to conduct empirical and policy research to improve the recent decentralization reforms to forest management. Such research is

[1] This research is based on the common understanding that decentralization refers to 'power transfer from central authority to lower levels in political-administrative and territorial hierarchy' (Crook and Manor 1998). Chapter II discusses the definitions of decentralization in different fields of study.

expected to unearth important experiences of international significance.

This study aims to improve theoretical and empirical understanding of natural resource decentralization, taking forest decentralization reform in China as a case study. Using both qualitative and quantitative methods, it examines the effects of decentralization on forest management as well as the interactive processes between policies and local institutional dynamics that have shaped decentralization and conditioned its outcomes in China. Using an interdisciplinary strategy, the study employs a multi-level approach that includes the collection of data from a wide range of actors, from central government to local communities and multiple sectors, to generate a holistic picture of forest governance in China.

This introductory chapter discusses the rationale for research on forest decentralization and contains four main sections. The next section provides an overview of the empirical background of this research, with a focus on China's decentralization reform and forest management policy. Then I discuss the theoretical and empirical dimensions of research problem. After that, I present the research plan and objectives, and end with an outline of the chapters that follow.

1.1 Background

1.1.1 Decentralization in China

China's decentralization began with market deregulation and administrative reform of its bureaucratic system (Lin et al. 2005). Under Deng Xiaoping's "Opening and Reforming" policy, since 1979 the country's administrative and economic system have gone through several stages of dramatic change to distribute power and responsibility to lower levels of government (Yabuki 1995). In the initial reform, China transformed its centrally planned economy into a socialist market economy (Zhao and Zhang 1998) to improve efficiency in resource allocation, keeping the macro economy under the control of central government (Muldavin 1996). The government was careful to provide institutional incentives to local government to engage in local affairs and markets (Oi 1999, Lin et al. 2005). The consequences of the Opening and Reforming

policy are best illustrated by the rapidly growing economy, which has helped millions of people out of poverty, and the increasing role of China in the global economic system in the last three decades (see Yabuki 1995, Zhao 1996, FAO 1998, Zhao and Zhang 1998, Evans et al. 2000).

At the micro level, the decentralization initially took place in the form of the distribution of property rights. The 1979 land reform policy allocated communes' land to individual households through its Household Responsibility System. This entailed a changing property regime, and expanding commercial activities have brought rural communities into the market economy (Zhao and Zhang 1998). In contrast to Mao's central planning system, each household may plan and cultivate different products to respond to market demand individually, and decision-making power of individual land use have been allocated in association with the reform of land tenure (Lin 1987). The deregulation of central planning stimulated diversification in rural production (Lin 1992, FAO 1998).

With the administrative structure of decentralization, the reform period saw a significant strengthening of the role of local government role in local economic management matters such as investment approval, entry regulation and resource allocation (Oi 1999, Lin et al. 2005). The policy has enabled the local government not only to enjoy lower tax rates and a higher share of revenues, but also, and perhaps more importantly, special institutional and policy environments and greater authority over local economic development (Yabuki, 1995, Lin et al. 2005). With decentralization, local governments began not only to enjoy more autonomy in local economic management, such as in local enterprise development, but also to assume primary responsibility for the provision of local public goods and service. However, at the end of 1990s, a more radical change to the political system has been the introduction of village elections, allowing villages more autonomy and authority to strengthen local organization.

The 1998 passage of the Organic Law of the Village Committee (*cunmin weiyuanhui zuzhi fa*), legalized the popular election of Village Committees and increased village

autonomy (*cunmin zizhi*), promising, in principle, to transform local administration. It sought to extricate townships from village decision-making and change the township-village relationship from one of leadership to one of guidance. Village Committee representatives are directly elected by villagers and are accountable to the Village Representative Assembly (*cunmin daibiao dahui*) rather than to township government. The new system is designed to promote local decision-making, placing the responsibility and right to manage local natural resources in the hands of the Village Committees. The new law also established a new governance system in which townships, as the lowest level of state administrative power, are legally empowered to administer local affairs, while the village committees are defined as a form of village self-management organization entitled to self-government. A hierarchical administrative relationship no longer exists between townships and villages and the former "leadership" relationship has become one of "guidance". Village representatives are now directly elected by villagers and are theoretically accountable to the village congress (*cunmin daibiao dahui*) rather than to upper levels of government (He et al. 2005).

China's experience of promoting local democracy holds many important lessons regarding the distribution of authority among many layers of decision-makers. Research on the decentralization of China, however, has mostly focused on its impact on local economic development, paying particular attention to urban areas (e.g. Oi 1999, Lin et al. 2005). While some has been especially interested in the transformation of local states and rural society, literature on the village elections has focused on the significance of the elections for democracy, local state relations and economic development, and few studies investigate the impact of decentralization on local institution decision-making in natural resource management.

There is a clear trend that gradually pushes decision-making power out from the center towards institutions closer to the everyday needs of local people. However, in rural society, there is a call for the implementation of centrally defined policy goals to protect national environmental security (discussed in the coming section). This

intersection of these two trends creates a tension characterized by both serious constraints and promising opportunities. The essence of this tension is the ongoing search for a distribution of rights and responsibilities that best balances local, regional and national interests. It is of critical importance to government agencies, donors and NGOs working in these areas that we understand the impact of the overall decentralization reform and its impact on local state relations and relationship to other institutions of rural governance, if we are to discover means of sustaining and improving rural livelihoods into the future.

1.1.2 The policy context of China's forest management

After the founding of Peoples' Republic China in 1949, all forest lands were nationalized for promoting timber production, particularly in the north of China. In min-1950s, along with Mao's policy of collectivization to initiate a planned and centralized economy, the new government began reorganizing the rural society into elementary cooperatives that allowed collective landholding and pooled forest and agricultural resources, and divided returns to individuals according to the proportion of land and other resource contributed to the collective (Menzies 1997, Miao and West 2004). The collectivization allowed the management of forests remained more centralized and the forests were subjected to intense pressure to meet China's ambitious industrialization goals (Menzies and Peluso 1991, Harkness 1998, Sturgeon 2005). In 1958, the government launched the 'Great Leap Forward' that resulted massive deforestation from using timber for iron and steel production program, and later the Cultural Revolution in 1960s had further caused deforestation and famine (Liu 2001, Shapiro 2001, Sturgeon 2005, see also chapter 4 for detailed discussion).

In response to the collapse of Mao's Planning and Command system, a land reform was initiated in agriculture sector in the later 1970s to distribute the collective agricultural land to individual household with the establishment of Household Responsibility System. Following the success of this agricultural reform, the government adopted the same strategy to reallocate forest through its "Two Mountain

System". This decollectivization and marketization had the potential to radically transform property relations and rural decision-making mechanisms and strengthened local people's control over and access to natural resources, as well as their access to market (Liu 2001, Xu J.C. and Ribot 2004). Those provided great incentives to rural people and created impressive economic development. However, this rapid economic development and population growth had a detrimental impact on the environment (e.g. Ho and Vermeer 2006). As a readjustment strategy, the government ambitiously launched several environmental protection policies which pushed for further forest reforms at the grassroots.

Remote mountainous areas with rich forest cover such as Yunnan, Sichuan and Tibet have been heavily affected by ongoing environmental protection policy. To achieve the national goal of forest protection, these policies have limited the outcomes of decentralization (e.g. Xu J.C. and Ribot, 2004, Jiang 2006), while carrying out the recentralization of forest use. These policies include:

- ✧ Natural Forest Protection Program (NFPP), launched in 1998, which recognizes the environmental services of forests, largely in response to the Yangtze River flooding and deforestation. The NFPP bans all commercial-scale logging in primary and secondary forest in the middle and upper reaches of the Yangtze. A number of forest dependants have lost their option for timber production, impacting on their livelihood strategies (e.g. Xu J.C. and Wilkes 2004, Xu J.T. et al. 2006, Yin 2010)

- ✧ Sloping Land Conversion Program (SLCP) launched in 1999. To reduce erosion and soil loss and promote more sustainable agriculture, central government banned the conversion of forest on slopes exceeding 25 degrees for agricultural use. Cultivated slopes must be reconverted to forest, with compensation provided by central government. Areas and households adversely affected by this policy and the logging ban now need to find alternative food and income sources such as producing higher-value cash crops with processing them to add value (e.g. Weyerhaeuser et al. 2005, Xu

J.T. et al. 2006, He et al. 2009).

A milestone in China's rural development and forestland management was established on July 14, 2008 when central government ratified a set of national forest tenure reforms aimed at boosting productivity and raising the income of farmers in collective forest areas. Under the new legislation a household contract system was implemented in forested areas to encourage the planting of trees, inspire production initiatives and investment and promote a conservation culture. The reforms entrust rural households with responsibility for forest management and production, offering 70-year contracts that include provisions to transfer, lease and mortgage access rights to a third party. This tenure reforms policy was launched with clear characteristics of re-decentralization.

Clearly, the implementation of these policies fundamentally changes rural society's decision-making in natural resource management. In the agricultural sector, the consequence of the policies in the rapidly growing economy are obvious; they have, which has supported millions of people out of poverty during the past decades (Yabuki 1995, Zhao 1996, FAO 1998, Zhao and Zhang 1998, Evans et al. 2000,). However, implementation of the forest reforms has produced mixed and complex results due to the insecurity of forest ownership and continuous state intervention (see Hyde et al. 2003). The state strategy for conservation and development shifts according to national targets.

With the implementation of the recent policies it is important to observe what has happened to farmer's access to resources under the recent trend of sustainable development. It is hypothesized that environmental protection policies might constrain the improvement of local livelihoods by limiting farmers' access to natural resources and even force them back into poverty (e.g. Hillman, 2003, Xu J.C. and Wilkes 2004, WRI, 2005). The strict regulations might undermine local sustainable resource use and diversification (e.g. Xu J.C. et al. 2005a, He 2010). Social conflict may emerge due to competition for natural resources and poor environmental governance. These factors would ultimately lead to unsustainability in terms of both the environment and

the social economy.

Previous research on the decentralization of forest management has focused on a rights-based approach concentrating on forest tenure reform as the key method of decentralization (e.g. Liu and Edmunds 2003, Larson et al. 2010). It has failed, however, to examine the fundamental structure of local decision-making mechanisms related to the broad issue of rural politics, the reform of political administration and grassroots democratization. Moreover, current multi-stakeholder involvement (e.g. of NGOs and donor agencies) in forest management further impacts on forest management decision-making by local institutions, introducing a new dimension to understanding local dynamics of decentralization. The intercorrelation of those factors requires a deep and holistic re-examination of the decentralization of forest management and its ecological and social-economic outcomes to enhance critical understanding of China's forest policy and contribution to global society with regard to the state's experiences on forest management.

1.2 Problem identification

Over the last two decades, decentralization has been promoted globally as a policy instrument to improve the effectiveness and efficiency of natural resource management (WB 2000, WRI 2003, Agrawal et al. 2008). According to a World Bank study, "out of 75 developing and transitional countries with populations greater than 5 million, all but 12 claim to be embarked on some form of transfer of political power to local units of government" (Agrawal and Ribot 1999). Developing countries are undertaking different forms of decentralization whose processes and outcomes vary from place to place in different political, social and economic contexts. Scholars are therefore interested in understanding the dynamics of the decentralization process and its impact on development and conservation.

The existing literature on decentralization stems mostly from the fields of political sciences and public administration, with administrative public service at the centre of the research. This, however, has resulted in poor understanding of the

decentralization process and outcomes in relation to natural resource management, and particularly forest, and the theory of decentralization of natural resource management is underdeveloped (Tacconi 2007). A number of studies on decentralization have drawn on the notion of Community-Based Natural Resource Management (e.g. Kaimowitz et al. 1998, Agrawal and Gibson 1999, KIooster 1999), but have focused on community control rather than the role of local government. The case study of a Tibetan village in Yunnan by Menzies (2007), for example, had highlighted the community institutions for controlling sustainable mushroom management and forest governance. Other studies report on local governments receiving power from central government (e.g. Ribot 2004, Ribot and Larson, 2004). However, much of their decentralization analysis focuses on a particular level of – mostly local – governance and the decisions and actions of one particular governance actor at that level, failing to provide a holistic picture of a multi-level governance process of decentralization reform (see also Andersson and Ostrom 2008). In addition, previous studies perceive the "local" as passive power receivers, and a dynamic perspective on how "local" can actively struggle the power from the central has been given little attention (see also Baum and Shevchenko 1999). Those analyses overlook the multi-level dynamics and complexity of natural resource management, and thus research is needed to explore the multi-dimensionality of decentralized forest management in order to make a significant theoretical contribution.

In the last three decades, China has shown that market liberalization and political decentralization can significantly contribute to rapid economic growth and dramatic social development. Whereas great attention has been devoted to the central-local relationship and the economic outcomes of decentralization (e.g. Oi 1995, Lin 1999), the impact of decentralization on sustainable resource use and environment conservation is ambiguous and less studied. Some attention has been paid to the ways in which local governments manage and affect the environment. Given the largely negative environmental outcomes of economic growth in China, it is critical to ask why decentralization has not been reliable in fostering environmental

sustainability as it has facilitated socio-economic development. Presently, while the Chinese government has increased its financial and institutional investment in environmental conservation, China's forest governance structure and processes are poorly understood. Empirical and policy research are needed to improve recent policy reform in decentralized forest management.

These theoretical gaps and empirical significance call for in-depth research with a holistic perspective and multi-dimension of governance analysis of forest decentralization. By examining the decentralization process in China, this research builds critical understanding of the relations between the decentralization process and forest management to offer important knowledge contributing to the global community as its theoretical input and policy implication.

1.3 Research plan and objectives

As identified above, this research is an empirical case study of Southwest China, which is rich in forest and biodiversity and can provide insight into and understanding of forest decentralization. This study seeks to answer the overarching question: "How do the interactive processes between policies and local institutional dynamics shape the decentralization of forest management in China?" (see specific research questions in Chapter 3). It seeks to advance understanding of decision-making processes that affect forest management and governance. Using critical theories of the decentralization of natural resources (discussed in Chapter 2), the developed analytical framework not only allows effective capture of the linkages between livelihoods, the environment and cultures, but also promotes the concept of ecosystems within policy-making. A combination of qualitative and quantitative methodological approaches is applied to the data collection and analysis (see Chapter 3).

This research focuses on three key fields of forest governance: 1) the government's harvest quota system, introduced to limit logging; 2) the Sloping Land Conversion Program, which subsidizes farmers for returning marginal agricultural land to forest;

and 3) more recent forest tenure reform that promotes the redistribution of collectively-owned forest to individual households. The research does not address global influence and governance. In this Chinese context, study of the above three key influential fields of governance will provide insight into state-society relations in forest decentralization analysis. Chapters 2 and 3 describe the conceptual framework, the methodology and the research strategy in detail.

There are four general objectives of this empirical case study:

- enhance the theoretical background and understandings of forest decentralization
- understand and strengthen empirical knowledge of the impacts and processes of decentralization reform on forest management in Southwest China
- generate policy recommendations for sustainable forestry and forest ecosystem management for the decision-makers in State Forestry Administration
- disseminate Chinese experience of forest decentralization internationally.

1.4 Organization of this dissertation

This dissertation is organized into eight chapters. Chapter 2 discusses the theoretical background and reviews relevant literature on decentralization and forest decentralization. First, it reviews theoretical understanding of decentralization that detailed the rationale of decentralization reform, and different definitions of decentralization. It then discusses decentralization in forest management. Next, it discusses the conceptualization of forest decentralization, using the research framework developed by Agrawal and Ribot (1999) as the point of departure. To enrich the framework, the concepts of the local state and polycentricity are reviewed, and Luke's critical view of three dimensions of power discussed to broaden the notion of power, which highlights the importance to explore the nondecision-making power.

Chapter 3 discusses the research methodology, beginning with the conceptual framework. The conceptual framework guides the empirical study and is formed by synthesizing and reconceptualising relevant theories and concepts reviewed in the previous chapter. This chapter introduces details of the research design and strategy to depict how the analysis of multi-level governance can be achieved. Next, I present the research site and discuss the rationale behind selecting Yunnan Province for the study and the village profiles of Xinqi and Pingzhang administrative villages, the two local study sites. The methods applied in this research are qualitative and quantitative, enabling generation of stronger evidential findings. Moreover, ethical consideration through over the research process is also presented, before I conclude the section.

Chapter 4 presents historical perspectives of resource and people dynamics in upland communities in Yunnan. It discusses three key periods of time to identify land use change and its environmental and livelihood consequences in relation to institutional change in Xingqi and Pingzhang villages. The forest transition taking place in both communities is evidenced by significant forest cover increase and decreasing agriculture land over the last two decades. The forest's recovery was mainly driven by the state's investment and afforestation programs, as well as the liberation of market and forest tenure reform. There is increasing off-farm employment in both upland communities as a labour surplus grows.

In Chapter 5, I examine forest governance with an emphasis on the timber harvest quota system. I focus on timber trade processes and attempt to understand how highly-centralized control of the quota system and power allocation have shaped the unequal distribution of benefits among the different actors involved in timber production and trade. I argue the contradiction of forest decentralization reform and centralized quota system discourages local investment and incentive for sustainable forest management.

Chapter 6 discusses how land use for environmental services has been regulated through the empirical focus on implementation of the state's Sloping Land Conversion Program (SLCP) in Xingqi and Pingzhang village. The environmental outcome of

SLCP varies from place to place in both villages and is strongly affected by participants' willingness and processes of implementation. Interactions between local institutions and local government significantly shape the outcomes and benefits of SLCP. The implementation of policy can differ from policy guidance, while actors making their policy at different level of government. Local states continue to make a great to say in the policy implementation. They affect not only the outcome but also the overall strategy of the policy. Multi-stakeholder engagement can help to improve SLCP implementation.

Chapter 7 discusses the forest tenure reform and the local dynamics of forest property rights. The aim of the second forest tenure reform is to promote local participation and village autonomy for the individualization of forest property rights. However, there is a big difference between the government's goals and villagers' perceptions. The implementation of tenure reform differs strongly from policy guidance. Using forest tenure reform as a key field of governance, the chapter examines local state performance and selective policy implementation at the two study sites. It discusses the role of the local state and multi-centre of decision in decentralization as well as existing accountability mechanisms and power relations in the forestry governance structure.

Chapter 8 concludes the thesis by drawing together the theoretical and empirical material presented. It highlights the theoretical and empirical contribution of the research and points out the policy implications of the study.

Chapter 2

Literature Review

2.1 Introduction

It is important to build a theoretical foundation for this research that not only examines the definition of decentralization but also constructs a conceptual framework for analysis of the decentralization of forest management. This chapter critically reviews several bodies of literature related to my research. The discussion first enhances the understanding of decentralization in natural resource management, addressing why governments are likely to conduct different forms of decentralization and how these can be defined. It outlines the research on decentralization in forest management. Following this, it depicts the conceptualization of decentralized forest governance, examining several key concepts and frameworks, and discusses how different analytical frameworks can be enriched by the integration of new concepts. Finally, the I present the context on deforestation in China, before conclude the chapter.

2.2 Understanding decentralization in natural resource management

Decentralization can mean different things to different people. The underlying reasons for governments' promotion of decentralization vary across the world; different governments have different expectations of the outcome, so the forms of decentralization that they undertake are different. This section addresses why governments decentralize, and the different forms that decentralization takes, to enhance theoretical understanding of it. In particular, I discuss the decentralization of forest management to present the link between natural resource management and the political process of decentralization.

2.2.1 Why decentralization?

Governments across the world, from liberal democracies to authoritarian regimes, are

pursuing decentralization reforms (World Bank 1988, 2000, WRI 2003). A rich international literature has developed on the myriad forms and intents of these policies and their development impacts. Among the many motivations of governments to decentralize, one of the most common is a desire to improve the efficiency of government administration and delivery of public services (Rondinelli and Nellis 1986, Rondinelli 1989). The governments believe that decentralization might improve service delivery by bringing decision-making and implementation closer to the target population (e.g. Agrawal and Ribot 1999, Larson and Soto 2008). Many governments also believe that decentralizing can cut central government costs and improve efficiency by reducing the size of the central bureaucracy, therefore, central governments also used decentralization to lighten their financial burden (Dupar and Badenoch 2002).

Decentralization is also promoted by international donor agencies and UN organizations. It is regarded as a natural complement to economic liberalization and the imposition of fiscal discipline, which are among the multilateral development banks' primary agendas. The World Bank has even introduced the language of "free market competition" into the decentralization debate by proposing forms of decentralization that increase competition between local government and private service providers (Litvack et al. 1998). Donor conditions requiring decentralization and the downsizing of central government have become another impetus for reform in developing countries. Decentralization may also be motivated by the desire to empower citizens and increase public participation in development planning and implementation processes (Meinzen-Dick and Knox 2001). Leaders may view decentralization as a way of deepening democracy and enhancing the legitimacy of a political system (Manor 1999).

In theory, decentralization is expected to lead to greater efficiency in achieving certain environmental and social outcomes. As the World Bank (1988) states, decentralization should improve resource allocation, efficiency, accountability and equity "by linking the costs and benefits of public service more closely". According to

the current logic of decentralization, efficiency is linked to local enfranchisement, or the broad-based inclusion of local people in public decision making (Ribot 2004). Local governments know the needs and desires of their constituents better than national governments, and it is easier to hold local leaders accountable (World Bank 2000). Decentralization should also promote democracy by “bringing the state closer to the people,” increasing local participation and building social capital (World Bank 2000, WRI 2003). Recent decentralization theorists assert that “underlying most of the purported benefits of decentralization is the existence of democratic mechanisms that allow local governments to discern the needs and preferences of their constituents, as well as provide a way for these constituents to hold local governments accountable to them” (Smoke 1999). It is also purported to improve sustainability (UNDP 1997, WRI 2003). The overall goal of decentralization is thus to improve efficiency, effectiveness, equity, poverty alleviation and sustainable resource use in developing countries.

2.2.2 Decentralization in practice

In practice, the effectiveness of decentralization in public service and promoting local democracy is varied. Successful decentralization has rarely been achieved; its promising outcome has been limited by a range of governance constraints, and its implementation varies from place to place. Most commonly, researchers have found insufficient power transfer to local administrative bodies (e.g. Larson 2005, Xu J.C. and Ribot 2004). Central governments often devolve obligations powers, rather than meaningful power with adequate resources, to local authorities. Where substantial powers are actually devolved to local government, the geographical area over which these powers can be asserted is highly circumscribed by central government, which limits the scope of the transfer by instituting new patterns and systems of oversight such that local authorities need permission and clearance before their decisions can be implemented (Ribot et al. 2006). In natural resource management, it is particularly true that the greatest limit to local authority is lack of control over raising or spending significant levels of revenue and deciding the fate of high-valued resources (e.g. Ribot and Larson 2004).

The central institutional choice of appropriate local institutions is critical in establishing decentralization, which can be undermined by transferring power to local authorities without a downward accountability mechanism (Agrawal and Ribot 1999). Central government may strategically choice those local institutions that are upwardly accountable and less democratized so they can most easily control the power transfer (Ribot 2004, Ribot and Larson 2005). In many cases, although the electoral process certainly establishes a degree of accountability, the depth of such accountability relations depends on the types of election and the extent to which they are competitive and regular (Ribot et al. 2006). As a result, it is hardly for power receiver to perform with representativeness to meet the interests and needs of local population.

Decentralization can also be limited by local elite capture, which can prevent all members of society participating in decision-making (Ribot 2004). As the World Bank (2000) reports, conceding power to local governments is no guarantee that all local interest groups will be represented in local politics. It may simply mean that power is transferred from central to local elites who manage to benefit most from decentralization reform.

Andersson and Ostrom (2008) report on a range of institutional incentives that may affect the outcome of decentralization. Their study reveals that interactions between actors at three different levels of governance were most important in deciding a local authorities' concerns and making decisions about natural resource management. The linkages among levels of government captured important incentive structures related to political accountability and affected local authorities' political commitment to natural resource governance, while the formal decentralization structure had no impact on budgetary allocation for natural resource governance (ibid).

Ribot et al. (2006) highlight a range of governance constrictions that limit decentralization, and they define those as recentralization and state resistance of decentralization. Practically, state intervention and the durability of donor-driven local institutions has manifested in another limit to decentralization. The authors outline the

two main strategies that central governments use to undermine the ability of local governments to make meaningful decisions: 1) by limiting the kinds of powers that are transferred; and 2) by choosing local institutions that serve and answer to central interests. Different social, economic and political contexts lead a great different of decentralization across the world. A holistic perspective with a multi-dimensional understanding of decentralization will make a significant contribution to the literature on decentralization.

2.2.3 Defining decentralization

Decentralization usually refers to “power transfer from central authority to lower levels in political-administrative and territorial hierarchy” (Crook and Manor 1998). It is concerned with the extent to which power and authority are dispersed through the geographical hierarchy of the state, and the institutions and processes through which such dispersal occurs (Smith 1985). From the administrative perspective, decentralization passes “responsibility for planning, management, and the raising allocation of resource from the central government and its agencies to field units of government agencies, subordinate units for levels of government, semi-autonomous public authorities or corporations, area-side, regional or functional authorities, or non-governmental private or voluntary organization” (Rondinelli and Nellis 1986:5). While political scientists and scholars of public administrative bodies define decentralization differently, it is widely used as an umbrella term to refer to any act in which a central government formally cedes powers to actors and institutions at lower levels (Ribot 2004). However, the political phenomenon of decentralization embraces a variety of concepts, and these concepts can be used interchangeably, which is confusing.

The terminology of decentralization reflects not only different understandings of decentralization but also the different types of decentralization that central governments in developing counties are engaged in carrying on. That imply the foundational issues of what kinds of power has been transferred to what level. In general, five different concepts are widely used to refer to the decentralization of

public administration and natural resource management:

- **Deconcentration**: concerns transfers of power to local branches of the central state, such as prefects, administrators, or technical line ministry agents (Mawhood 1983). Deconcentration, also called as Administrative Decentralization, "redistributes decision-making authority and financial and management responsibility among levels of the central government; there is no real transfer of authority between levels of government." (Gregersen et al. 2004).

- **Delegation**: the transfer or creation of broad authority to plan and implement decisions concerning specific activities within specific territorial boundaries (Rondinelli et al. 1989). More often, governments transfer responsibility to organizations representing specific interest groups in society that are established and operated by members of those organizations such as farmers' cooperative organizations, trade unions, women's and youth clubs etc. (Esman and Uphoff 1984, Uphoff 1986). Delegation is a form of administrative decentralization in which responsibilities and authority are transferred to semi-autonomous entities that respond to central government but are not totally controlled by it (Blaser et al. 2005).

- **Devolution**: A form of administrative decentralization that transfers specific decision-making powers from one level of government to another (this could be from a lower to a higher level of government in the case of federations, or the government transferring decision-making powers to entities in civil society (Gregersen et al. 2004)). Regional or provincial governments, for example, become semi-autonomous and administer forest resources according to their own priorities and within clear geographical boundaries under their control. Most political decentralization is associated with devolution (Blaser et al. 2005). In natural resource management, devolution refers to "the transfer of 'natural resource management to local individuals and institutions located within and outside of government' (Edmunds and

Wollenberg 2003:1), though some people use ‘devolution’ only in reference to direct community transfers” (Larson 2003, Meinzen-Dick et al. 2001).

- **Fiscal decentralization**: A term often used to describe the transfer of funds (block grants or portions of national tax revenue) or fund-raising powers (ability to tax, charge fees, receive grants or impose fines) to local authorities. Although funding is essential in decentralizations, it is merely a kind of power that is decentralized (Ribot 2004). Therefore the decentralization of budgetary and revenue generating powers is often identified by analysts as a separate form of decentralization (e.g. Manor 1999, Crook and Manor 1998). Fiscal transfers constitute a cross-cutting element of both deconcentration and political decentralization rather than a separate category (e.g. Agrawal and Ribot, 1999).

- **Democratic decentralization** occurs when powers and resources are transferred to authorities representative of and downwardly accountable to local populations (Crook and Manor 1998, Agrawal and Ribot 1999). These are typically elected local governments. Democratic decentralization aims to increase public participation in local decision making and is an institutionalized form of the participatory approach (Ribot 2002). In comparison to deconcentration, democratic decentralization is considered the stronger and the one from which theory indicates the greatest benefits can be derived (Ribot 2004).

According to Ribot (2004), democratic decentralization and deconcentration constitute the two primary forms of so-called formal decentralization. He further augured, various institutions are empowered in the name of decentralization, but not all transfers of power from central government to local institutions constitute decentralization. Local institutions function on a continuum from public to private, and the transfer of power to the public domain to serve public interests is regarded as decentralization. Other institutions, even customary authorities and NGOs (as public-private hybrids), are usually oriented toward their own interests, even if these

interests include public service and may not be commercial.

While narrow definitions of decentralization may risk failure to provide a holistic picture, a broad notion of decentralization can also fail to be analytical. Decentralization is not only an administrative act but also a political process; scholars have proposed a more dynamic definition that takes into account bottom-up demand for change (Larson and Soto 2008). Hence democratic decentralization is:

> ...a set of institutional arrangements among public institutions and social actors that emerge from a broader process with two principle dimensions: (a) top-down measures aimed at transferring responsibilities [and powers] – political, administrative and/or fiscal – to lower levels of government and (b) the gradual opening of spaces for participation from below, induced by the actions of social movements and local governments that challenge the traditional (centralized) way in which public policy decisions have been made. (Larson and Ribot 2005)

This definition takes into account the recognized importance of demand from below in making decentralization work in practice. This research explores the process of redistribution of access to political power and resources, as implied by decentralization.

2.2.4 Decentralization in forest management

Research on decentralization is particularly powerful through the lens of natural resource management, since the natural resources sector differs from other sectors in ways that augment and throw into relief the potential and risks of decentralization as a lever for local democratisation and development (Larson and Ribot 2005). Natural resources are at once critical for local subsistence and income generation and the basis of significant wealth for governments and national elites (Larson 2003, Ribot and Larson 2005).

The literature on the decentralization of natural resource management predominately focuses on forestry, so the term “decentralization” is interchangeably used with the term “decentralized forest management” to refer to the transfer of control over resources from the state to local communities and from central to local government

(Tacconi 2007). This is because, as Larson and Soto (2008) state, in many ways forests serve as an effective proxy for natural resources in general, in part because of their intimate relationship to other key resources such as biodiversity and water sources. Forests are also the most important resource in natural resource decentralization policy debate and the most studied in the natural resource decentralization literature. Fundamentally, however, decentralization is about governance, and the central questions are the same as for other resources: Who should make which decisions over natural resources and why? Who benefits from these shifts in rights and powers? Focusing on one resource also reduces variability and thus facilitates comparison among cases and the possibility of drawing general lessons. Decentralization in forest management, as in other natural resources, has several particular characterisers that increase both the potential and the risks of natural resource decentralization as a force for local development and democracy.

Another important factor that makes forest decentralization special is its scale; the management of a geographically-specified forest can have effects that reach beyond its physical boundaries. This includes, for example, regional downstream effects on water use, contamination or deforestation, the national and global effects of deforestation, biodiversity loss and, currently, climate mitigation. Regional and national concerns and local interests in forest management do not always coincide. Thus, forestry's economic potential and the relation of that potential to local power relations increases the prospect of conflict and of resistance to change from those who hold power under centralized schemes (Larson 2003). Forest management applied in improve watershed functions require the consideration of a wide range of actors' interactions, governance within the watershed from upstream to downstream, and the involvement of stakeholders at different levels beyond the watershed. Thus institutional arrangements for forest management systems must include broad consideration of multi-level governance. The regulatory framework for forestry is often complex and even internally contradictory, and may not be consistent with broader decentralization policies, adding yet further grey area to "the rules of the game".

Forests are subject to economic forces that shape the costs and benefits of exploitation as well as ideological debates regarding the appropriate balance between exploitation and conservation.

In practice, the decentralization of forest management has been initiated in the lights of global efforts towards Community-based Natural Resource Management (CBNRM). CBNRM has demonstrated that local democratic control over forest resources can improve local livelihoods, and have positive ecological effects and contribute to local livelihood improvement (Agrawal and Gibson 1999, Klooster 1999). These are some of the central goals that the decentralization of forest is supposed to achieve. However, most CBNRM experiments have been spatially and temporally limited and have taken place under the close surveillance, political protection and financial support of international donors and NGO projects, and have frequently failed to establish a lasting local institutional framework for community-based development (Ribot 2002, Larson 2003). Democratic decentralization reforms present the opportunity to move from a project-based approach toward legally institutionalized popular participation (Ribot 2002). Such reforms establish the institutional infrastructure necessary –empowered representative local authorities – to scale up these popular-participation efforts across national territories (Ribot 2002, Tacconi 2007). Thus, as Ribot (2002) argues, in theory the current shift from participatory to decentralized natural resource management approaches is a "shift from externally-orchestrated direct forms of democratic inclusion to representative forms of democracy under elected local authorities". This shift represents a move from ad hoc and experimental mobilization and inclusion techniques to more institutionalized, more easily replicated, and potentially more sustainable forms of participation through local democracy (ibid).

Clearly, decentralization to local government could provide a stronger institutional basis for CBNRM as well as other forms of transferring the control of resources to local institutions (Larson 2002, Ribot 2002, Tacconi 2007). Research on decentralization in forest management has been advocated to promote democratic

decentralization where local authorities gain rule-making discretion in forest management and downward accountability is established (Ribot 2002, Larson 2003, Ribot and Larson 2005), although democratic decentralization has rarely taken place (Larson and Ribot 2005). The emphasis of this research in China, therefore, is on understanding the extent to which forest policies in China, promoted in the name of decentralization, foster democratic processes and goals. Local democratization is examined in parallel to understand how this political process impacts on forest governance.

2.3 Conceptualization of decentralized forest governance

This section reviews the literature on the conceptualization of forest management, using the analytical framework developed by Agrawal and Ribot (1999). To enrich this framework, the conceptual framework of this research articulates the perspective of political economy and institutional theories, thus providing conceptions of “local state”, “polycentric governance” and “critical view of power”.

2.3.1 Actor, power and accountability framework

Academic communities are developing and enhancing the theory of decentralization in order to examine the outcomes of decentralization of natural resource. Significantly, Agrawal and Ribot (1999) have developed an analytical framework to assess natural resource decentralization. Conceptualizations of *power*, *actor* and *accountability* are a critical dimension of analysis of the decentralization of natural resources. Without an understanding of the powers of various actors, the domains in which they exercise their powers and to whom and how they are accountable, it is impossible to know the extent to which meaningful decentralization has taken place (see Crook and Manor 1998, Ribot 1999, Larson and Ribot 2005, Tacconi 2007).

With decentralization reform, as Agrawal and Ribot (1999) point out, the *actors* in the local arena who exercise powers over public resources may include appointed or elected officials, NGOs, chiefs, powerful individuals and corporate bodies. The actors are positioned at different levels of the social action. As decentralization is about

changes in how actors at different levels of political authority exercise their power, for effective decentralization the actors involved are located at different levels of action. Any one or a combination of actors may be seen as the appropriate legal persons toward whom decentralization should occur. Because the dealings of particular actors are impelled by their interests, it is likely that the same types of powers devolved to different actors will lead to different outcomes. Consequently, the nature of decentralization depends to a significant degree upon who gets to exercise power and the accountability relations to which they are subject (ibid).

According to Agrawal and Ribot's (1999) framework, based on the notion of the actor, powers of decision-making are crucial to understanding decentralization. The authors discuss four types of *power* that social actors may receive in decentralization reform:

a) power to create rules or modify old ones: this set of powers allows decentralized actors to legislate principles that structure decisions and actions concerning who can benefit from given resources or opportunities, how, and to what extent;

b) power to make decisions about how a particular resource or opportunity is to be used: such powers enhance the discretionary authority of local bodies, and directly affect the use of resources that increase the autonomy of the actor who gains these powers;

c) power to implement and ensure compliance to the new or altered rules: it implies the power to execute, and to meter and monitor whether actors are carrying out the roles they are supposed to perform. It also includes the power to impose sanctions on those who do not subscribe to the tasks they are supposed to perform, and to enforce those sanctions;

d) power to adjudicate disputes that arise in the effort to create rules and ensure compliance: it is significant whenever new rules are created, or there is a change in the type of decisions made by particular actors. Such changes also signify a modification in the powers of these actors. Local populations who are

influenced by devolved powers should have the possibility of appealing to accessible channels of adjudication. What is critical about powers of adjudication is not that they be devolved to some representative bodies at the local level. It is more important they be exercised accessibly and without systematic bias.

While understandings of actors and power provide the context for understanding decentralization, examining accountability offers tools to analyze its effectiveness. Accountability is the relation between outcomes and sanctions (Ribot 2004), and is the exercise of counter-power to balance arbitrary action (Agrawal and Ribot 1999, 478). It is manifested in the ability to sanction (Manin et al. 1999). The accountability relation is established through an ensemble of sanctions. Accountability is constituted by the set of mechanisms that, in theory, ensure that policy outcomes are as consistent with local needs, aspirations and public interests as policy makers can make them (Ribot 2004). Thus, if powers are decentralized to actors who are not accountable to their constituents, or who are accountable only to themselves or superior authorities within the structure of the government, decentralization is not likely to accomplish its stated aims. It is only when constituents come to exercise accountability as a countervailing power that decentralization is likely to be effective (Agrawal and Ribot 1999). Ribot (2004) has reviewed the existing literature for accountability mechanisms that researchers should consider:

- **Legal recourse** through courts is an important means of accountability. Independent judiciaries are critical for holding public figures accountable;
- **Polycentricity** of government and the **balance of power** are structural aspects of accountability (Ostrom 1999);
- **Independent or third party monitoring**: civic society organizations, academia NGOs (Non-government Organizations) or elected comptrollers can help construct downward accountability;
- **Transparency:** that is, openness to public access to information, is an

accountability mechanism frequently called for by international organizations;

- **A free media** helps in monitoring and shaping public action;
- **Public discussion and consultation** enhance information dissemination and involve the public in decision-making;
- **Participatory processes** can be employed to improve dialogue between government and people and enhance the improvement of public for decision-making;
- **Civic education** empowers people to understand their rights and to know the powers and obligations of their representatives;
- **The proximity of leaders** to their community and their embeddedness in local social relations can also make some difference;
- **The reputations** that societies hold people to and people want to maintain can also shape their public and private behavior. **Trust** is another element that, if developed, is believed to improve the accountability of local governments;
- Placing **discretionary powers** in the hands of local leaders can increase the accountability of government and the engagement of civic organizations in public affairs;
- **Civic dedication** can play an important that public sector workers can be highly dedicated to their jobs;
- **Administrative dependence** on local elected authorities can increase administrative accountability to local populations. In opposition, upward accountability increases when appointing system applied for promoting authorities.

To sum up, based on the conceptualization of actors, power and accountability, this study examines the linkages between local social relations and larger economic and political forces (e.g. Crook and Manor 1998, Agrawal 2001, Ribot 2004, Sikor 2006). It

is important to explore how actors are involved in multi-level decision-making over the management of forest resource in the process of decentralization as a broader issue of governance. The inclusion of accountability within the framework of decentralization allows us to examine relations between different levels of decision-making to understand how stakeholder concerns are represented in governance processes. The conceptualization of actor, power and accountability provide a starting point for this research to understand the power transfer and accountability mechanisms from only a linear and static view. To obtain a more holistic and dynamic view of the decentralization process, the following two sections discuss the concepts of polycentric governance and local states.

2.3.2 Polycentric governance

Analyses of decentralization in the literature predominantly focus on the dichotomy between “central” and “local”, centre attention on a particular level of governance and often limit the study to the decisions and actions of one particular governance actor at that level such as a local government administration, a neighborhood organization or a rural community. Some studies expand their scope of analysis to include relationships between ‘‘local government’’ (whether a formal governmental organization at provincial and municipal levels or a local community) and local resource user groups. This, however, overlooks the multi-level dynamics and complexity in natural resource management; the theory of polycentricity can help to broaden the analytical perspective.

The institutional theory of polycentricity was first developed by V. Ostrom et al. (1961) for the study of collective goods in metropolitan areas. Polycentric governance systems refer to the coexistence of multiple centers of decision making that operate within a general set of rules but are formally independent of each other. Andersson and Ostrom (2008) highlight a polycentric analytical approach to the analysis of natural resource management that studies conditions for developing systems where each has some degree of autonomy to cope with one set of discrete policy arenas.

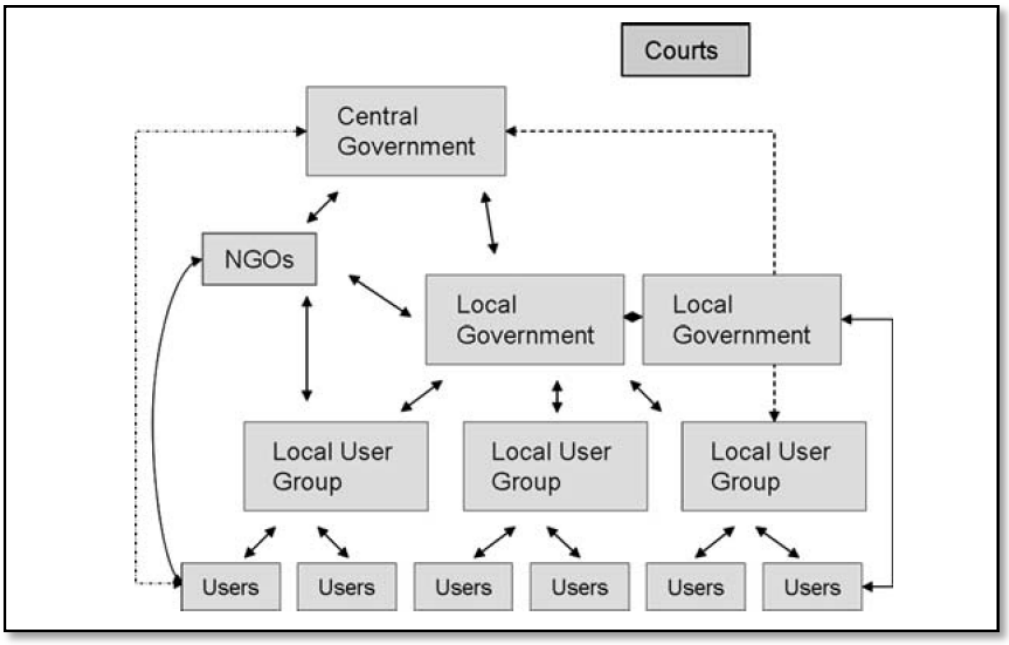
The approach assumes that governance arrangements are more effective when citizens are able and authorized to self-organize not just one but multiple governing authorities at differing levels (Ostrom 1990, 1999, Andersson and Ostrom 2008). Another key assumption is that the self-governing capabilities of groups of citizens should form the basis for the design of multi-level institutional arrangements, such as those making regional public policy and constitutional law. In a polycentric governance system that is operationalized to a greater or lesser extent in the world of public affairs, each unit exercises considerable independence to make and enforce rules within a circumscribed scope of authority for a specified geographical area (Andersson and Ostrom 2008).

The research of polycentric governance for the decentralization of forest management will particularly benefit from the notion of a scope of authority for a specified geographical area where governance relations may be different in each field. These fields might include, for example, forest property rights, harvest quotas, land use and conservation and the state forest program, which help to generate multiple centers of power structure and decision-making. The political order is polycentric when there are many overlapping arenas (or centers) of authority and responsibility at all levels, from local community groups to national government and informal arrangements for governance at the global level.

The institutional theories of polycentricity focus on “relationships among multiple authorities with overlapping jurisdictions that provide institutional incentive for performance of local institutions” (Andersson and Ostrom 2008). Andersson and Ostrom further argue that institutional arrangements operating at other governance levels – such as national government agencies, international organizations, NGOs at multiple levels, and private associations – play a critical role in natural resource governance regimes. They advise that analysts should consider the extent to which complementary back-up institutions exist at higher or lower levels of governance that can help to offset some of the imperfections at any one level. Hence to explain decentralization outcomes, a polycentric analyst looks beyond the performance of a

local government unit to consider relationships among governance actors, problems, and institutional arrangements at different levels of governance, as illustrated in Figure 2.1.

Figure 2.1 Polycentric perspective in natural resource management



Source: Andersson and Ostrom 2008

To sum up, scholars interested in polycentricity engage in multilevel analysis of how actors at different levels of governance interact and influence one another's decision making (Neef 2009, Ostrom 2005). This emphasis on multilevel dynamics has not yet, however, penetrated empirical studies of decentralized reform. From the polycentric perspective of decentralized resource governance, multi-level actors' involvement in natural resource management positions the "local state" as a mediator that facilitates and negotiates the state's power transfer, balancing and contesting the power of international donor/NGOs, as well as being accountable to local citizens to some extent. This research applies polycentric perspectives from institutional theories and the concept of the local state to re-examine the actors in the decentralized governance of forest management. It broadens the analysis from the linear dimension to multi-dimensional levels of governance.

2.3.3 The local state

Most decentralization analysis of “local states” takes a static point of view and perceives them as passive power receivers acting as agents of central government. Those scholarships are holding the idea that decentralization has in some degree however strengthened the state power and control (e.g. Castro and Nielsen 2001, Oyono et al. 2005, Larson and Soto 2008). Other study of state power and social forces (e.g. Migdal et al. 1994, Migdal 1994, Migdal 2001) reminds us to re-examine the phenomenon of state and society relations by taking a dynamic view of the struggle for domination and push for transformation, with the local state playing a critical role as mediator in state-in-society relations (Shue 1994). The research, therefore, should advance understanding of the dynamics of the local state in contesting, negotiating and balancing central government power in the decentralization process.

Using the case of China, Shue, (1994) reports that so-called frontline officials (normally local officials), despite their status as agents of the state, frequently found it advisable, or easier, or more natural, or simply more in accord with their own convictions, to throw in their lot with local people and departmental associations against the impersonal requirements of the state bureaucracy above them. She found that localist protectionism – sometimes called “departmentalism” – on the part of low-level officials and functionaries in small units attempted to find ways to protect their own units against what they viewed as unwarranted or unfair restrictions and demands made by superior organs of the party state. Even there is no election as a means to promote the downward accountability, as advocated by most democratic decentralization research scholars (e.g. Ribot 2004, Larson 2003), the local state acts as a mediator in state-society relations through which they continuously challenge state power to meet local needs and interests.

This can be better understood through Migdal’s model of state-in-society (1994, 2001), which provides a dynamic perspective of state-society relations, using the term “state embeddness”. Criticizing Shil’s dichotomous centre-periphery model, Migdal presents

his state-in-society model, which views society as a mixture of social organizations rather than the dichotomous centre-periphery model, with the local state located between central government and society and playing a major role in struggling to wrest power from the central state. The state-in-society model sees societies not as static formations but as constantly changing as a result of their constant struggle for social control. In this model, authority can be delegated to other organizations peacefully as opposed to vying for authority, leading to conflict.

According to Migdal (2001) there are three levels of social control: (1) compliance, which is how a population responds to state demands; (2) participation, i.e. leaders organize the population for specialized tasks through institutions; (3) legitimacy, which is the acceptance of the symbolic order associated with the idea of a state as people's own system of meaning. Where the centre-periphery model presented the idea that states act on their own authority and then coerce the periphery to accept decisions using rewards or sanctions, the state-in-society model presents the idea that the major role of the local state is to act with the will and support of the periphery/society. Migdal goes on to say that the periphery is more important than previously imagined, and can use its resources to gain authority. There are pockets of social control outside the domain of state leaders that shape at least part of how the state acts. Migdal (2001) concludes with two comments on society: (1) society constrains and transforms the state through internal forces; (2) society is transformed by the state.

Moreover, rather than seeing decentralization as expanding the state's power and control, the state-in-society school concludes that states and other social forces may be mutually empowering and state embedded in society (Migdal et al. 1994). This school urges scholars to eschew a state-versus-society that rests on the view of power as a zero-sum conflict between the state and society. The real power struggle is more complex and seldom involves large collectivities called state pitched against large collectivities called society. For most some social groups, this is an accurate rendering of the nature of their interactions with the state, but it is not always the case; some interactions between society and state can create more power for both, and

some interactions, of course, favour one side over the other. Some vitiate the powers of the other side. It is therefore necessary to avoid a statist perspective, which is misleading as it puts the state in an adversarial position vis-à-vis society, and instead to favour viewing the state as part of society. Differentiating the state from other administrative levels will enhance the understanding of state-society relations. It is important to analyze how local states function in this dynamic power struggle in decentralization reform.

Another important contribution to conceptualizing local states is offered by Jean Oi (1992, 1995, 1999), who develops the conception of “local state corporatism” to explain the dynamics of local states, and particularly their contribution to Chinese economic development. According to Oi (1992), local state corporatism refers to the workings of a local government that coordinates economic enterprises in its territory as if it were a diversified business corporation. As decentralization bring both institutional incentives and economic opportunities to local government, as Oi (1995) observes in her study of the post-Mao reform of China, the institutional changes blend the entrepreneurial and governmental roles of local governments with economic and political consequences. The Maoist legacy provided the political capacity for the local corporatist state, but the adaptation of this legacy to maximize local economic and political interests through rapid economic development created a system qualitatively distinct from the original. In one sense, local officials have simply modified the Maoist system to adopt preferential allocation of resources in line with many of the successful late-industrializing states. In another sense, however, the entrepreneurial interests of local governments have compromised their role as agents of the central state.

O’Brien and Li’s work (1999, 2006) has made a major contribution to understanding local state performance and state-society relations in China study. They use the term “street-level discretion” to explain how local states selectively implement the central policy, as some cadres conscientiously enforce unpopular policies while refusing to carry out other measures that villagers would welcome. According to these authors (1999), the cadre responsibility system for promoting, evaluating and monitoring local

cadre performance has created street-level discretion. As a result, local officials attempt to implement policies that can be more easily quantified for evaluation and monitoring (normally unpopular policies such as birth control and tax collection), while they fail to carry out policies that are difficult to quantify, however welcome, such as promoting village autonomy by elections and giving rights to farmers. O'Brien and Li (2006) later use the concept of "rightful resistance" to describe how rural people against domineering local official occurs when there is a gap between central law and regulations, and local officials' non-compliance with such laws. They state that this rightful resistance severs the higher-level officials, frustrated by the actions of undisciplined and often corrupt local officials who fail to follow central dictates. As a result, a new model of state-society is created that enables an alliance between the central state and the local population to call for the accountability of local officials.

To summarize, conceptualization of the local state is crucial for decentralization analysis. Decentralization reform significantly transforms relations between central and local, the local state representing the local entities that receive power from the central state, but they do not always act as passive rule-followers and may also perform as rule-creators (Oi 1995, Andersson et al. 2004). Therefore, within the new decentralized administrative order the central state remains the foremost redistributor, regulator and policy coordinator, thereby continuing to play a decisive role in the determination of who gets what, when and how. The fact is that central-local relations are increasingly marked by bilateral bargaining and compromise rather than unilateral command and coercion (Baum and Shevchenko 1999). Local officials act as the equivalent of a board of directors, and sometimes more directly as chief executive officers. The local state continues the practice of planning and monitoring, but the new institutional incentives increasingly encourage local officials to carry out their regulatory functions to maximize local rather than national interests. They use centralized policy instruments and institutions, but the purposes for which they are employed and their application are significantly different (Oi and Rozelle 2000). The decentralization of forest governance therefore adds a new dimension to

understanding how local states perform their mediator function in state-in-society relations. While they receive power, they also struggle to create power to meet their and/or local people's needs with regard to forest management.

2.3.4 Revisiting the critical view of power

To obtain a broader notion of decentralization analysis, the concept of power should be reviewed to enhance my analytical framework. The review of the concept of power can also enrich the notion of power from Agrawal and Ribot (1999) framework, which focuses on decision-making power and which, according to Lukes (2005), only reflects the "first dimension" of power, power as coercion. The broader notion of power exists when we add another two dimensions of power into the decentralization analysis. As Lukes (2005) states, the two-dimensional view of power involves a qualified critique of the behavioural focus of the first dimensional view (which assumes that non-decision making is a form of decision making), and allows for consideration of the ways in which decisions are prevented from being taken on issues over which there is an observable conflict of interests, seen as embodied in express policy preferences.

Thus power is not merely a matter of control over active decision making. Power is also exercised to ensure inaction on issues. Bias can be organized by those in power to exclude issues from the agenda. The analysis of power therefore requires the examination of both decision making and non-decision making, where a non-decision is a decision that results in the suppression or thwarting of a latent or manifest challenge to the values or interests of the decision-maker (Bachrach and Baratz 1970: 44). People's interests and potential considerations are restricted by influencing, shaping, or determining others' wants and preferences, while an agenda has been pre-set up. Thus, this notion of power takes into consideration non-decision making power to explore how structural procedures, institutional arrangements and social-political relations enable/disable decision making.

The third dimension of power arises from the critique that the first and second

dimensions do not adequately account for social-structural processes that shape human relations and interests, and is the social-structural production of consent and norms. This dimension of power goes beyond the observable essences of power as coercion and constraint, in that it accounts for social-structural practices that shape how interests themselves are defined (Raik et al. 2008). Power is actually exercised to shape preferences via values, norms and ideologies and to pay attention to aspects of power that are least accessible to observation. It is seen as the imposition of internal constraints, and those subject to it acquire beliefs that result in their consent or adaptation to domination by either coercive or non-coercive methods (Lukes 2005). Power is one of those concepts which is unavoidably value-dependent; that is, "both its definition and any given use of it, once defined, are inextricably tied to a given set of (probably unacknowledged) value-assumptions which predetermine the range of its empirical application" (Lukes 2005: 30). Conflict does not necessarily correlate to the exercise of power, but the threat of coercive power always lies behind the production of consent. As Lukes (2005: 27) notes, "the most effective and insidious use of power is to prevent ... conflict from arising in the first place."

The third dimension of power – the power to prevent the formation of grievances by shaping perceptions, cognitions and preferences in such a way as to ensure the acceptance of a certain role in the existing order (Lukes 2005), is a contentious and, at the same time, fundamental concept. Lukes' research into the three-dimensional view of power presents three features: 1) the exercise of power may involve inaction rather than observable action; 2) people may be unaware of the consequences of others' unconscious exercise of power over them. 3) power may be exercised by collectivities such as groups or institutions.

Some existing forestry research reminds us to re-examine the exercise of power by the state from the viewpoint of these three dimensions of power. For instance, the state extensively claims that shift cultivation is a major cause of deforestation, while the literature reveals that it is a necessary practice for maintaining sustainable land use and biodiversity as well as local livelihoods (e.g. Dove 1993, Lambin et al. 2001,

van Vliet et al. 2012). In watershed management of upstream and downstream dynamics, Blaikie and Muldavon (2004) have made a significant contribution to understanding how scientific knowledge was applied to claim that upstream users' resource use practices have serious detrimental costs for those downstream, and so science-led policies were formulated to attempt to avoid anthropogenic or accelerated erosion in the steep-slop and fragile natural environmental of the Hindu Kush-Himalaya region. Forsyth and Walker (2008) use a case study in Thailand to explain how the state constructed an environmental narrative using science-based knowledge to support its political objectives of state expansion and control in the uplands. The domination of scientific forestry and scientific epistemology has limited the possible existence of other forms of knowledge (Scott 1998). It encourages people to believe that science in forestry management is advanced and sustainable while other form of management are backward and less technologically advanced, which eventually leads to unsustainable forestry management. This simplistic understanding of national and human-nature interactions as well as solutions suggested by environmental science and knowledge are important arenas of political control and exercise of power.

The three-dimensional view of power has further enriched the Agrawal and Ribot (1999) framework regarding understandings of power. This broader notion of power has helped to reveal the complex process of decentralization of forest management that involves rearranging the institutional structure, redefining the rules, reformulating relationships and redistributing power. In particular, it helps to uncover causal links between inaction and their consequences, such as the non-appearance of a political issue.

2.4 Deforestation in China

Although there is an increasing of forest cover claimed as forest transition in China in last two decades (Rudel et al. 2005, Mather 2007, Xu J.C. 2007), the forest resource crisis continues, characterized by a high demand for wood products and environmental services, a rapid depletion of natural forests, and poor quality

man-made forests (Yin 1998). China's forest crisis is a manifestation of the general failure of its economic system (Yin 1998) as well as its policy system in governance and institutions (Menzies and Peluso 1991, Sturgeon 2005).

As a result of a series of institutional changes following the establishment of People's Republic of China in 1949, natural forests in the northeast and the southwest were nationalized and state forest bureaus were created to assume management responsibility (Harkness 1998, Yin 1998). Similarly, private forests in the south and other rural areas were collectivized and community forest farms were formed to carry out timber harvesting and forest management (Liu 2001, Miao and White 2004). In the planned economy, however, these organizations operated based on commands from the bureaucratic hierarchy rather than incentives from the marketplace (Yin 1998). Production and management decisions, as well as product and factor prices, were determined by the state. For these organizations and individuals within them, reward was never closely linked to their performance (Shapiro 2001). Moreover, because of lack of internal incentives and external monitoring, the management of existing forests and the establishment of new resources, let alone active environmental protection, was rarely taken seriously (Yin 1998, Harkness 1998).

Also, in Mao's period, forest resources were treated as free goods: they had no economic value as no human labour was involved in their production (Harkness 1998, Sturgeon 2005). Forest management was dominated by a objecitve of timber-oriented production to support industrialization. This led to tremendous over-exploitation with scant attention to re-planting (Harkness 1998). In 1958, the government launched the 'Great Leap Forward' that resulted in massive deforestation from using timber for iron and steel production program communal mess halls, and later the Cultural Revolution in 1960s led further deforestation (Menzies 1994, Liu 2001, Shapiro 2001, Sturgeon 2005, Chokkalingam et al. 2007,see also chapter 4 for detailed discussion).

The Great Chinese Famine further pushed the extensive use of marginal forestland which is low productivities for agriculture. In the late 1960s and early 1970s, campaigns for local self-sufficiency in grain led to large-scale deforestation of sloping

lands for cultivation of corn and wheat (Harkness 1998). However, ambitious tree-planting goals were set annually, but afforestation was carried out principally through mass-mobilization style campaigns, and survival rates were low (Harkness 1998, Rozelle et al. 2000, Chokkalingam et al. 2007, Mather 2007, He et al. 2012). The estimated net forest loss was 6.64 million ha in 1950-1962 during Great Leap Forward and 6.58 million ha in 1973-1981 during the Cultural Revolution (Chokkalingam et al. 2007), and forest cover shrink from 12.7% to 12% in Cultural Revolution period (see chapter IV, Zhang et al. 1999).

In early 1980s, the initiating decentralization in the form of market liberalization and establishment of Household Responsibility System had provided incentive for agriculture production, and it later expended to forest sector. This forest decentralization started to redistribute the forestland from collective (village) to individual household (Liu 2001, Miao and White 2004). Every household received a piece of forestland for fuel wood collection and tree plantation as freehold forestland (private), while the collective forest also reallocated to individual household in a contract base as Responsibility Forestland, which entitled use and management right to individual (Yin 1998, Liu 2001).

However, the attempts to decentralize forest management and improve security of tenure over forestlands did not solve the problem of forest degradation. Rather, the incomplete implementation of forest redistribution gave farmer a bad sense of loss the ownership of forestland, while the later launching and application of restrictive harvest quota system in 1985 again manifested a frequent forest policy change that have cause further forest tenure insecurity (see also Liu 2001, Miao and White, 2004). Unsure of the duration of the new policy, many farmers - fearful that the land use policy might change again at any time - responded by immediately felling all of the trees on their contracted land (Yin 1998, Xu and Wilkes, 2004). And, the uncertainty also came from economic transition, together with market liberalization (timber price increase) and forest privatization, causing farmers to harvest their forests early (Zhang et al., 1999).

Thus, farmers lost their interests for long-term investment in forestry and attend to continue convert forest for agriculture which they can really gain. The transfer of forest use rights and management responsibility to local farmers in an insecurity matter was not enough to regenerate the forest and environmental degradation continued (Xu et al. 2005), whereas state investment for afforestation remain in the form of annual mass campaigns of tree planting with very low tree survival rate during this time (Rozelle et al. 2000, Mather, 2007).

On the other hand, the market liberalization also gave a great flexibility of operation for the state-owned forest farms. A number of state-owned forest farms increased their timber production to meet increasing market demand. Expansion of timber production in state and collective forest resulted a significant forest loss during this period, and particularly, serious deforestation and rapid decline of forest volume in the major collective forest region of South China has been clearly observed (Hyde et al. 2003, Zhang 2003, Zheng et al. 2001).

The increase of deforestation and forest resource crisis called a great attention from central government of China since 90s. A series of policy instruments and market instruments applied to improve the effective forest management including pay for afforestation on cropland (SLCP), improving tenure security (forestland certification). That gives a great reason to explore how do the interactive processes between policies and local institutional dynamics shape the decentralization of forest management in China, as the research questions raised in Chapter 3.

2.5 Conclusion

This chapter has critically reviewed the relevant literature to build a theoretical foundation for this research. The literature has provided an insight into the research aim stated in Chapter 1; to foster the underdeveloped theory of forest decentralization and enhance the understanding of the role of the local state. The literature reviewed has contributed to constructing a conceptual framework for analysis of the interactive process between the policies and local institutional dynamics shaping the

decentralization of forest management.

In theory, one of the most common governmental motivations for decentralization reform is a desire to improve the efficiency of administration and delivery of public services. There may also be pressure to decentralize from an international donor. Decentralization is expected to lead to greater efficiency in achieving certain environmental and social outcomes, but the perfect decentralization rarely occurs. As a result, the central governments of different developing counties carry out different types of decentralization.

The literature highlights how the decentralization of forest management has been initiated in light of global efforts toward CBNRM. However, it goes beyond CBNRM in scaling up and institutionalizing participation. Forest decentralization has demonstrated that local democratic control over forest resources can improve local livelihoods and have positive ecological effects as well as contributing to local livelihood improvement. However, the reality of the environmental and social outcomes of forest decentralization and the type of decentralization that will lead to more sustainable forest management and local livelihood are questionable.

This chapter has conceptualized forest decentralization for this research. Agrawal and Ribot's (1999) conceptualization of *actor, power* and *accountability* provide a powerful analytical framework through which to assess effective decentralization by examining what kinds of power have been distributed, and to whom, and what kinds of accountability relations exist in the power receiver. Rather than treating the local state as static power receivers, theoretical debate suggests that we should hold a dynamic view of it. Local states do not always act as passive rule followers; they also perform as rule creators. Central-local relations are increasingly marked by bilateral bargaining and compromise rather than unilateral command and coercion.

To enrich the framework of Agrawal and Ribot (1999), polycentricity has also been discussed as a multidimensional perspective on decentralization. Polycentric governance allows research to carry out a multivalve analysis of how actors at

different levels of governance interact and influence one another's decision-making. This research benefits from the notion of scope of authority for specified geographical areas, where governance relations may be different in each field, generating multiple centres of power. The polycentricity concept, as opposed to a dichotomous view of central and local states, guides my examination of multi-stakeholder involvement in decentralization.

The literature has allowed me to critically examine the concept of power, beyond decision-making power. Lukes' three-dimensional view of power brings a broader perspective to the understanding of power. A study of power requires examining both decision making and non-decision making, where a non-decision is a decision that results in the suppression or thwarting of a latent or manifest challenge to the values or interests of the decision-maker while institutional procedures and social-structural process that shape how interests themselves are defined and pursued. This helps to reveal the complex process of the decentralization of forest management which that imply rearranging institutional structure, redefining rules, reformulating relationships and redistributing powers.

Systematically synthesizing these abstract concepts into an empirical study approach for my fieldwork, the conceptual framework of this thesis is presented in the coming chapter, and empirical research field methods are developed based upon this framework.

Chapter 3

Research methodology

3.1 Introduction

This chapter discusses the research methodology to link the theoretical discussion presented in Chapter 2 with the subsequent empirical chapters. It begins with a description of conceptual framework that built an analytical approach to link Agrawal and Ribot's framework (1999) with concepts of the local state, polycentricity and Lukes' three-dimensional view of power. The development of the conceptual framework aims to integrate different concepts to guide the empirical analysis. I present the research questions, which draw on the notion of the conceptual framework; outline the empirical research strategy; and describe the study site, including the rationale behind its selection, and the village profile. Next, I present the methods of data collection used. I highlight the strengths of the combination of qualitative and quantitative approaches used and detail my data collection techniques, and explain how I analyzed the qualitative and the quantitative data. Before drawing to a conclusion in the final section of this chapter, I discuss the ethical considerations involved in doing fieldwork in a mountainous region of Yunnan in Southwest China.

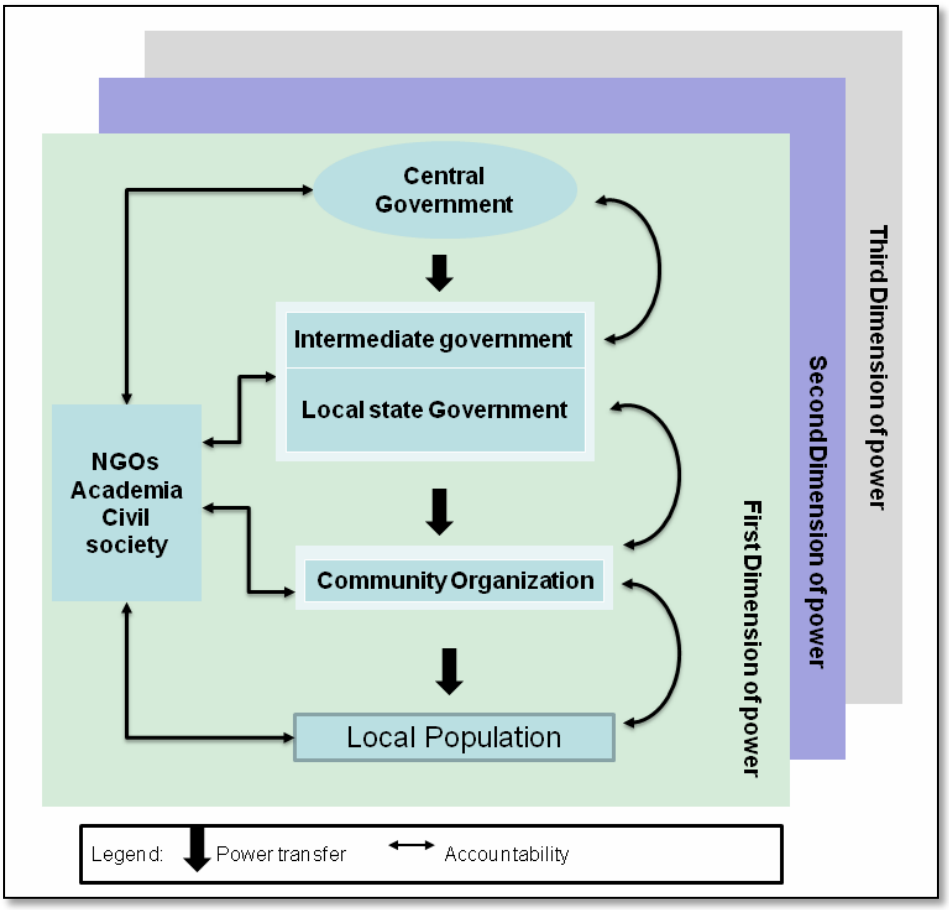
3.2 Conceptual framework

The conceptual framework presented in Figure 3.1 guides this study and outlines how different concepts have been linked for the analysis based on the theoretical discussion in the previous chapter. Agrawal and Ribot's framework (1999) of actors, power and accountability forms the basis of my conceptual framework. It allowed me to track the origins of decentralization linearly and examine how central governments transfer power, what kinds of decision-making power are allocated to what level of administrative body and what accountability relations exist. The Agrawal and Ribot framework particularly examines central-local relations in transfers of power to

address the issue of the upward and downward accountability of power receivers (local government). Agrawal and Ribot (1999) argue that demotic and effective decentralization can only take place when sufficient decision-making power is transferred to the lowest level of local government, which is downwardly accountable to the local population. I examine various accountability mechanisms to improve understanding of how accountability relations are created. The conceptual framework for the analysis of multi-level forest governance presented here is enriched with three key concepts, presented below.

Firstly, polycentricity: the analysis of this research is not limited to the dichotomy of central and local power. Rather it looks the actors are differentiated by their administrative level and social and political identities. I analyze four key levels of administration. The first is central government, including different ministries (Forestry, Environment, etc.). These make policy for China overall and distribute power. They are the key actors and expect positive social and ecological outcomes from decentralization. The second level is provincial and prefectural intermediate government. These also take part in making policy and may make special policy based on national policy guides. The third level is the local state situated as county and township, which implement policy and make significant decisions in response to special local situations. The final level is the village committee, the lowest administrative body to receive power from the centre, which has a certain amount of decision-making power. The polycentric system reminds me to keep in mind the perspective of the multidimensional governance structure and add another actor of civil society and private sector. Those actors are more independent, but can influence the transfer of power and accountability relations. They may also transfer some power to different administrative levels. Ostrom (1999a, 199b) argues that government polycentricity and the balance of power are important structural aspects of accountability, and a balance of power in which there are counterpowers to central government can increase accountability by increasing the number of actors with a voice in politics and the ability of non-central actors to scrutinize central institutions.

Figure 3.1 Conceptual framework



The second concept that enriches Agrawal and Ribot's framework is the local state. The conceptual framework looks at the local state from the dynamic viewpoint as not just a static actor following rules and implementing policy but key in making practical policy at the local level. The local receives a great deal of power and resources from the central in decentralization, enabling it to perform according to the local context. As pointed out by Migdal (1994, 2001), the local state's performance in decentralization emerged in the state-in-society model which sees states and other social forces as mutually empowering and sees the state as embedded in society. Thus the concept of the local state is important in understanding how a certain policy has been changed at different levels of administrative structure, and what decisions were made by the local state. Those policies making served partially upward accountability, but also have certain degree of downward accountability to the local population. The underlying reasons why the local state performs differently from the central state's requirements

are extensively examined, guided by the conceptual framework. More broadly, this conceptual framework allows analysis of the power negotiations, struggles and comprises among the actors at different levels, improving understanding of state-society relations from a dynamic perspective.

The third additional concept is the critical view of power. Including the three-dimensional view of power in the framework allows me to examine the process of decentralization with a particular critical view of power. 1) The first view of power, in decision-making, is most obvious. It includes the power to make decisions, create and modify rules, implement policy, and adjudicate disputes (Agrwal and Ribot 1999). 2) The second dimension is power as a constraint. While the state open for decentralization, central and local states perform differently, restricting the potential benefits of the decentralization. It is the power to restrict decision-making to ensure inaction on issues (Lukes 2005). As noted by Ribot et al. (2006), this state exercised power for restriction the decision-making in decentralization has apparent characteristics of recentralization and state resistance to decentralization. This research thus takes non-decision-making power into consideration to explore how structural procedures, institutional arrangements and social-political relations enable or disenable decision-making. 3) The three-dimensional view of power goes beyond the observable essences of power as coercion and constraint in that it also accounts for social structural practices that shape how interests themselves are defined. It creates an ideology of how forest and natural resource should be managed in a way that can be labeled “scientific forestry” (e.g. Scott 1998, Sivaramakrishnan 2000). This “dominated acquiescence” produce the knowledge for power exercises lies behind the production of consent and norms. The third dimension of power is therefore examined in this research to explore how far forest decentralization policy considers and recognizes local context, while the process of decentralization is shaped by ideological understanding of natural resource management.

3.3 Research questions

Within this enriched decentralization framework, this research seeks to answer the overarching question: “How do the interactive processes between policies and local institutional dynamics shape the decentralization of forest management in China?” Five further research sub-questions guide this research:

- *RQ1. Which forest management powers have central government transferred to what local government units, and from what levels of government?*
- *RQ2. What accountability mechanisms do Chinese law and administrative procedures institute, and for which local government units?*
- *RQ3. How have actors at various levels responded to forest decentralization policy?*
- *RQ4. What relations of power and accountability emerge in different fields of policy intervention?*
- *RQ5. How do local political-economic contexts influence the emerging power and accountability relations in particular locations, and what role does the local state play in the decentralization process to influence practical policy change and the outcome of decentralization?*

Then overreach research question and sub-research questions correlated to research objectives in Chapter one that is aimed to make both theoretical and empirical contribution to forest decentralization research. The sequence chapters was organized in accordance to the research questions that empirical chapters (chapter 5-7) was structured in guidance of sub-questions and conclusion chapter (chapter 8) attempted to reflect the overall researches and provide a synthesis discussion. The research questions also determined the choice of methods, thus take 3.1 summarized the directly links between each research questions and technique methods for data collection, whereas a detailed introduction of those methods will present in data collection section in this chapter.

Table 3.1 Link research questions to methods

Research Question	Methods
RQ 1. *Which forest management powers have central government transferred to what local government units, and from what levels of government?*	1) Systematic policy document (external and internal) analysis – using textual analysis 2) Semi-structured interviews with key respondents. 3) Participatory Observation at local meeting 4) Focus groups on issues of forest change and forest management decision-making. 5) Mini-workshop of policy review 6) Historical lines to understand the resource and institutional dynamics. 7) Participatory mapping to understand the land use changes, also the participatory mapping help to stimulate the discussion of forest change, forest tenure change and forest allocation. 8) household survey
RQ 2. *What accountability mechanisms do Chinese law and administrative procedures institute, and for which local government units?*	1) Systematic policy document (external and internal) analysis. 2) Semi-structured interviews with key respondents. 3) Focus groups on issues of forest change and forest management decision-making. 4) Participatory Observation at local meeting 5) household survey
RQ3. *How have actors at various levels responded to forest decentralization policy?*	1) Semi-structured interviews with project management, farmer, villager leaders, township leaders, forest officials at different levels, international organization. 2) Mini-workshop on policy review. 3) Participant observation

	4) group discussion 5) household survey
RQ4. *What relations of power and accountability emerge in different fields of policy intervention?*	1) Semi-structured interviews with key respondents. 2) Participatory Observation (including at local meeting) 3) Focus groups on issues of forest change and forest management decision-making. 4) household survey
RQ5. *How do local political-economic contexts influence the emerging power and accountability relations in particular locations, and what role does the local state play in the decentralization process to influence practical policy change and the outcome of decentralization?*	1) Semi-structured interviews with key respondents. 2) Participatory Observation (including at local meeting) 3) Focus groups on issues of forest change and forest management decision-making. 4) household survey 5) land use and land cover change analysis

3.4 Research design and strategy

This study adopts a descriptive qualitative case study approach to obtain an in-depth picture of forest governance and its context. Quantitative methodology is applied to analyze quantity of forest, the outcomes of the decentralization of forest management and socio-economic data. The qualitative strategy aims to generate insight into the concrete processes and practices of local institutional decision-making in forest management throughout the decentralization reform. Special emphasis is given to the analysis of power transfer and institutional arrangements, both in terms of rule of game and rule-in-use, which create the accountability mechanisms and local representation, as these are difficult to quantify. This is the whole array of the underlying institutions and mechanisms that affect forest governance structure to enable/constrain local participation in forest management, providing incentives or disincentives for local contribution to sustainable use, and eventually affect the outcome of decentralization reform. Meanwhile the quantitative strategy serves to support the insights gained by the qualitative analysis by analyzing changes to forest cover, land cover and land use, and local economic status. Both qualitative and quantitative data analysis strategies are used in order to strengthen the research findings.

To obtain a holistic perspective of decentralized forest governance, this research was conducted at multiple levels. Agrawal and Ribot (1995) point out the significance of tracking what kinds of power have been transferred to what levels of administrative body. In additional to understanding the multiple levels of decision-making in forest management, I pay attention to cross-level governance involving NGOs, different government line agencies and the private sector to analyze cross-level institutional linkages and conflicts (Berkes 2002). I examine the roles of various actors in the decentralized forest governance structure. The scope of my analysis of the case study covers relations of power and accountability in China but omits relations between China's central government and international actors. The influence of the latter is only considered where they play an active role in influencing domestic governance, particularly at the grassroots level, as international NGOs and donor agencies do.

Therefore, although I concentrate on two locations (see Site Selection, below) for the collection of local data, this study includes components at higher levels of governance. It tracks the specific decision-making process at each level in response to particular forest policy and regulations, such as the Sloping Land Conversion Program, forest harvest permits and quotas, tenure rights and land allocation, etc. This analysis of

forest governance enables me to obtain significant data and understand the power structure and accountability. I investigate how the decision-making process, from the formulation of policy/regulations (at central and provincial level) to policy implementation at county/township/community level and the decision-making process in monitoring and evaluation at the provincial and prefectural level. I pay particular attention to policy implementation processes, as the implementation of forest policy involves government actors throughout the administrative hierarchy, each with its own mandates, priorities and capacities. The outcomes of policy implementation are inextricably linked to the roles of each level of decision-making and how it relates to the levels above and below it. In the region, the first step towards decentralization is often a deliberate effort to clarify the responsibilities at each level of decision-making in order to make the coordination and provision of inputs as efficient and effective as possible.

The methodological strategy for multi-level governance analysis helps to reveal how various actors exercise power and authority in decision-making and the implications of this. The allocation of authority over decision-making has significant environmental and social implications for both local governmental and community actors. Local government and community decision-makers respond to policy pressures that affect environmental conditions and livelihood viability, drawing on both formal/official and informal/unofficial decision-making processes. Multi-level governance analysis, therefore, is key to the conceptual framework of this research.

In my analysis of forest governance in Yunnan province I focus on three key fields to gain a dynamic perspective of forest governance changing over time. This focus helps greatly in understanding and exploring decentralization as a process rather than as a single policy. First, I focus on timber harvesting, particularly looking at how the quota system, which shapes the distribution of benefits via uneven power distribution, was established and implemented. Secondly, I explore regulatory land use to obtain insights into the exercise of power by the state in decentralization and local institutions' reactions. To achieve this, I took the world's largest afforestation program, the Sloping Land Conversion Program, as a case study. The third field of forest governance analyzed is forest property rights, focusing on current forest tenure reform, to examine power redistribution in forest management. The research holds also temporal dimension to understand the decentralization process from the viewpoint of these three fields, as all three are associated with a particular policy that covers the harvest quota system in 1985, SLCP in 1998 and forest tenure reform in 2007.

3.5. Site selection

In this section I present the rationale for my site selection, covering both the broad geographical area of Yunnan province and the two study villages. The section provides a general socio-economic and ecological background of the study sites and more detailed village profiles.

3.5.1 Rationale for choosing Yunnan province

The case study was carried out in Yunnan Province in Southwest China. Yunnan is of great importance in Southwest China due to its upland agriculture and relatively well-preserved, rare and valuable forest resources. In Yunnan, an ethnic minority area, policy changes often undermine traditional institutional management of natural resources on which the livelihoods of most communities depend. Poverty and environmental degradation have become part of the socio-economic and ecological landscape of the uplands. Upland communities are now under great pressure to find alternative sources of income that conform to sustainable development practices (Weyerhaeuser et al. 2005, He et al. 2009). The implementation of state policies for forest resource conservation, using a locally-insensitive "blanket approach" (*yi da qie*), runs counter to these policies' fundamental objectives (He 2007, He et al. 2007). Despite forest usufruct having been allocated to households via the Responsibility Contracting System, instable policy and policy implementation have made forest access and ownership much more insecure in most cases (Yeh 2000, Xu J.C. and Ribot, 2004, He 2005). This ambiguity of property rights in post-socialist China has had variable ecological and social outcomes (Ho 2002).

Recently, village autonomy, as deeper decentralization reform for building grassroot democratization, aims to enable to village administration organization control over their own resource for sustainable use and the implications for villagers' longer-term livelihoods (He et al. 2007). Villagers have a new outlet by which to voice their concerns in the popularly-elected Village Committees, which, in principle, are more accountable to village representatives than to higher levels of government. The nexus of these two forces – large-scale government interventions on the one hand and local democracy on the other – form the context of my research.

From the above, it is clear that changes to forest policy and local institutions over the past 50 years have had a tremendous impact on forest use and management. I have worked for organizations that carry out research on conservation and development from the perspective of finding out how projects and policies can be implemented more effectively in Yunnan province. This research sparked my interest in evaluating

the impact of decentralization reform on sustainable forestry and further understanding the linkages between policy, local institutions and forest conditions in China's changing society.

3.5.2 Research sites

3.5.2.1 Site selection criteria

This project was conducted in two selected villages in Baoshan Municipality of Yunnan province to explore and compare the impacts of decentralization reform, changing institutions and relevant policies on local forest management. It investigates the linkages between policy, local institutions and forest resources management. Taking the decentralization of forest management as the point of departure and looking back at historical changes to institutions during different periods, I examine the changing political landscape and the effects of the changes on forest management.

I have personal contacts both in the local communities and the forest department, as I had worked in the area for more than five years in agroforestry development. This helps to build the mutual trust between interviewees and myself as well as with the officials. During the field work, I also stayed in the villages and lived in the different households that help to build the personal relations with interviewees and to gain more in-depth qualitative data. The sites include different ethnic groups with diverse livelihoods and forest governance issues and varying ecological conditions but come under the same forest policy and political decentralization reform. Selecting two villages enhanced the analytical benefits of comparative research to understand local-level dynamics and works with villagers, while keeping the scale of the research feasible and manageable. The selected research sites offer the potential for a holistic understanding of the cultural, ecological and economic variables on which forest decentralization impacts.

3.5.2.2The villages in Baoshan prefecture

Baoshan prefecture is located in Western Yunnan province (98°05′-110°02′N, 24°08′-25°51′S) at China's border with Burma and in the upper watershed of the Yangtze, Mekong and Salween Rivers. Its territory covers 19,637km^2, of which 92% is mountainous, with 1.15 million hectares of forestland, 81% of which is collectively managed by the community. Forest cover in Baoshan accounts for 61.9% of the area and is dominated by species of pine (*Pinus yunnanensis, Pinus armandii, Pinus kesiya*), alder (*Alnus spp*), and fir (*Taiwania flousiana*). The forest is mostly plantation forest, planted in the last two decades after rapid deforestation during the Great Leap

Forward and the Culture Revolution (see Shapiro 2002). Administratively, it comprises five counties: Longyang, Tengchong, Longling, Shidian and Changning. The two case-study villages selected are Pingzhang Village in Longyang County and Xinqi Village in Tengchong (see Figure 3.2).

Figure 3.2 The location of study sites

Both villages are located in a typical subtropical zone with elevation ranging from 1530-2640 m.a.s.l., 1000-1500 mm of rainfall and an annual temperature of about 14-17℃. The communities settled more than 500 years ago and used to practice upland agriculture growing corn, buckwheat, barley and rice, mainly for subsistence. However, their farming systems are now more integrated into the market economy, and trees such as walnut, chestnut, pear and camellia are being planted for agroforestry functions and upland economic development. A large area of forest is managed either collectively or individually and the dominant forest cover is plantation, with huge investment from the government. Table 3.2 shows the biophysical characteristics and socio-cultural features of the two villages in Baoshan prefecture.

Table 3.2 Biophysical characteristics and socio-cultural features of the two study villages

Study site	Pingzhang Village, Longyang County	Xingqi Village, Tengchong County
Geography		
Area (km^2)	13.53	53.19
Elevation	1530-2640	1685-2550
Annual rainfall (mm)	1037.3	1428.5
Longitude	E99.1° - 99.05°	E98.6° - 98.33°
Latitude	N25.14° - 25.20°	N25.03° - 25.11°
Socio-economics		
Subunits	5 natural villages (11 production teams)	5 natural villages (13 production teams)
Ethnicity	Yi and Bai	Han-Chinese
Total households (2010)	410	1026
Total population (2010)	1680	4276
Net income per capita	360 USD (2010)	561 USD (2010)
Livelihood strategy	Farming, animal husbandry and forestry, increasing off-farm work	Forestry, farming, off-farm work
Ecology and land use		
Dominant forest Vegetation	Pine (*Pinus Armandii, Pinus yunnanesis*), alder (*Alunus nepalensis.*	Fir (*Taiwania flousiana, Tsuga Dumosa*), pine (*Pinus Armandii, Pinus yunnanesis*), alder (*Alnus nepalensis*),
Tree plantation	Walnut *(Juglans sigillata),* Alder *(Alnus neaplensis), pear (Pyrus pyrifolia)*	Walnut (*Juglans sigillata),* fir *(Taiwania flousiana), alder* (*Alnus spp.)* camelia *(Camellia reticulata)*
Cultivated farmland	Rice, corn, wheat and barley	Rice, corn
Related forest policy implementation	Since 2003 Sloping land conversion program, 2008 forest tenure reform	Since 2003, Sloping Land Conversion Program, 2007 forest tenure reform, 2009 Camellia plantation

Source: Field survey 2011, (1USD= 6.5 CNY).

Located on the margins of China, Baoshan is classified as one of China's most undeveloped regions, and the study villages, particularly Pingzhang, are typical poor villages of the region. The steep mountains and geophysical conditions limit farmers' access to technology, market opportunities, central funding support and other resources that would improve their livelihoods. Current market integration and forest policy reforms have provided forest-dependant people with more right to make decisions. However, questions remain about how these marginalized groups can benefit more from state investment in forest programs and forest decentralization, as this depends not only on program operation and investment but also, and more importantly, on local institutional dynamics. This is the central question asked in this study to assess the effectiveness of forest decentralization.

3.6. Data Collection

This section presents details of the data collection during my fieldwork period in China from August 2010 to December 2011. As an interdisciplinary study, both qualitative and quantitative data were collected, using a wide range of techniques. After the introduction of the secondary data collection I present the qualitative and quantitative approaches to field data collection.

3.6.1 Secondary data collection

The literature and newspapers relevant to this research were widely investigated, paying special attention to historical records of local communities and townships and reports from the Provincial Forestry Department and State Forestry Administration (SFA). A critical review of official documents and relevant policy papers was undertaken. A considerable amount of grey literature on forest policy was already available, and there were opportunities to access additional policy review documents, consultant reports and internal evaluations during the key stakeholder interviews described above. Statistics on forest changes were collected from provincial and township official documents and local records. Materials and documents from central, provincial and township levels promoted a sound understanding of the political and socio-economic context, particularly the context of forestry reform and sustainable forestry. The written history of the research site and general information about indigenous knowledge of forest management was also gathered.

3.6.2 Quantitative data collection

1) Spatial data

Spatial databases were developed in using topographic maps, geographic positioning system (GPS), Landsat and RapidEye images, as presented in Table 3.3, below. The Landsat TM and ETM$^+$ images are free downloads from Global Land Cover Facility (GLCF, ftp://ftp.glcf.umd.edu/glcf/Landsat/), while the RapidEye images were purchased from the supplier. Ground points were collected at both sites using GPS (Global Positioning System) to interpret the images and validate the classification results. The selection of the time period of 1989, 2002 and 2010 aimed to understand land use and institutional change when the forest allocated and market liberalization in 1980s, and SLCP start in 2002. The land use image for 2010/2011 helped me to understand the consequentially change from institutional dynamics.

Table 3.3 Specification of spatial data used for analysis

Region	**Longyang county**	**Tengchong**
Study sites	**Pingzhang village**	**Xinqi village**
First set	26 February 1989, Landsat TM 30m	26 February 1989, Landsat TM 30m
Second set	13 January 2002, Landsat ETM$^+$ 30m	13 January 2002, Landsat ETM$^+$ 30m
Third set	24 December 2010, RapidEye 5m	30 December 2010 4 January 2011, RapidEye 5m
Scale of topographic map	1:50,000	1:50,000

To generate comparable land use/cover data across sites and time, the satellite images were manually interpreted using a supervised classification system. Following FAO (1999), table 3.4 presents the definition used for land cover classification. This definition covers the wide range of land use in the locality with a simplified format for analyzing land use and land cover change. The satellite images were registered to topographic base maps and the land cover categories were digitized, attributed and entered into GIS (Geographic Information System).

Table 3.4 Definitions of land cover categories used in image classification

Land cover category	**Criteria**
Agricultural land	Irrigated and non-irrigated cropland
Close canopy forest	Crown density cover >20% of area
Open canopy forest	Crown density cover 10-20%
Grassland	Grassy vegetation, woody plants <10%
Shrub	Woody plant cover > 20%
Water	Water body
Settlement	Rural settlement/building

2) Household survey

A questionnaire survey was carried out in both villages using the cluster random sampling approach in correspondence to different natural village. To ensure the survey would be statistically meaningful and keep to the lowest cost, a total of 43 households in Pingzhang village and 60 in Xingqi village were sampled. The survey targeted the household head, who knows better of his/her household to gain a better understand of household information and decisions. Table 3.5 outlines the characteristics of respondents in questionnaire survey which indicated that certain ranges and balance of gender and ages and education that had been covered in the survey. Five trained research assistants (3 males and 2 females) from ICRAF-China office was involved in the questionnaire survey.

Table 3.5 Characteristics of respondents in questionnaire survey

Variable	Gender		Age (years)		Education (years)	
	Male (%)	Female (%)	Mean (S.D.)	Range	Mean (S.D.)	Range
Pingzhang (n=43)	30 (69.76)	13 (30.24)	42.88 (9.79)	29 – 65	5.23 (3.30)	0 - 12
Xingqi (n=43)	44 (73.33)	16 (26.67)	50.62 (11.03)	26 - 76	6.53 (2.78)	0 - 15

Source: Field survey 2011.

The questionnaire was designed to elicit four main categories of information at the household level: a) household information; b) land use decisions and participation related to SLCP; c) opinions of and involvement in forest tenure reform; d) day-to-day forest management engaged in, including cutting, pruning etc. The full questionnaire is in the Annex.

3.6.3 Qualitative data collection

1) Participatory land use mapping

In association with spatial data, participatory land use mapping was extensively used to gather dynamic information on local community and villager forest use activities. As a key participatory rural appraisal (PRA) tool, it also helped to collect information about decision making, planning and implementation process for forest utilization (Chambers, 1989). The data gathered by participatory land use mapping focuses on management and conservation activities in the local community. In response to the current forest tenure reform, the participatory land use mapping was a powerful tool for data collection with regard to decision-making on forest allocation, zoning and land classification. It also helped to track the customary forest use/boundary in overlapping/conflicting with current forest allocation. Rapideye images were purchased and used for the participatory land use mapping to help local people to

identify objects and boundaries.

2) Historical line

A historical line was drawn to obtain village histories in relations to the local institution changes and forest management via an interactive PRA group discussion involving the village elders.

3) Interview

Interviews were widely applied during the study to collect primary data on multiple topics from farmers and other key informants, and further data were gathered from an analysis of relevant socioeconomic policies. These data served as a framework within which to study changes in sustainable forestry and institutional arrangements over time and to examine information and insights obtained during the semi-structured informal interviews and analysis on institution. In addition, this method was employed to understand different perspectives at multi-levels of sustainable forest management.

To identify the multi-levels of governance involved in decentralized forest management, the sampling strategy for data collection was applied to different levels. The “bottom-up” approach was employed to track the forest management from community to national level and to involve all the stakeholders. Villagers were interviewed to cover different identities, including community leaders, full members of village committees, the traditional village chief and village elders who could provide a history of the village and forest management. Various actors involved in local forest management were interviewed to gather data on how the forest had changed over time and how forest implemented at local level.

Based on previous personal contacts, government officials and academic researchers were selected using the snowball sampling method suggested by Bryman (2002), while their background knowledge and experiences also considered. Members of forestry agencies and government at township, county, prefecture, provincial and central levels were interviewed for data on the dynamics of institutions in response to the decentralization of forest management. International organizations (the Ford Foundation, World Bank), NGOs (World Agroforestry Centre, Conservational International, Nature Conservancy) and academic actors in the forest governance process were interviewed to gain multiple perspectives on particular policies and investigate their engagement in the policy process (e.g. policy consultation, policy lobbying and their interaction with government bodies).

The interviews were the key method used to obtain good-quality data and narratives

on forest governance from the lowest (households) to the highest level (central government).

4) Observation

Participatory and direct observation were adopted during the study, particularly in day-to-day forest use and management in the community and at community and government meetings. This method was used to understand local institutions (rule-in-use). I used this active process to develop and test appropriate methodologies. This required collecting both existing information and dynamic information in a changing situation.

5) Group Discussion

Discussions for community-level focus groups of women, old people, people who had completed higher education, livestock herders and groups from the different wealth clusters in each community were convened in order to gather data on the stakeholders' perspectives of sustainable forestry in the transition to decentralization. I used the groups to identify background information on each village and its forest, noting factors such as the resources, where they are located and how important they are to different elements of the community. I also used these meetings for more detailed discussion of resource use and rules. The focus group discussions were digitally recorded and, to minimize the need for lengthy transcription, short notes were taken during the sessions and more detailed notes made immediately following their conclusion.

6) Mini-workshop on policy review

At the provincial and national levels, several mini-workshops were convened to gain a deep insight into relevant policy on the decentralization of forest reform. These policy review workshops were critical to conduct groups discussion for policy-makers.

3.7 Data analysis

This section presents the data analysis process. The collected qualitative and quantitative data were compiled, processed and analyzed using SPSS 19 (Statistics Package for Social Science) and ArcGIS 9.0 software to analyze the survey and spatial data respectively.

3.7.1 Analysis of spatial data

For the analysis of land use and cover change, a single formula was used to calculate annual land use dynamics, as suggested by Xu J.C. et al. (2005b). In the formula

$\mathrm{LC} = \frac{\mathrm{Ub}-Ua}{Ua} \times \frac{1}{\mathrm{T}} \times 100\%$, LC stands for the degree of land use change, Ua is the area of the particular land use at beginning of year “a”, Ub represents the area at the end of year ‘b’ and T is the length of time. When the unit T is set as a year, LC indicates the degree of annual individual land use dynamics.

By overlaying different attributes, the spatial data analysis was performed to understand the ecological outcome of the SCLP, i.e. its state target vs. actual land converted etc., enabling the links of institutional analysis and quantitative data analysis.

3.7.2 Analysis of questionnaire data

Descriptive statistics such as percentages, means and frequencies were used, mostly to describe the dynamics of forest changes including cover, species etc., household profile and economic statutes. Analytical statistics were processed using regression while the entire test was done at 95 percent confidence level [$p<0.05$]. Student-T testing was used to compare the mean.

3.7.3 Analysis of qualitative data

Descriptive information was presented qualitatively, especially regarding property and institutional arrangements, village history, the process of policy implementation locally, local property and institution practice and so forth. The qualitative data were analyzed particularly with the links with conceptual framework where key concepts and conception has been constructed to understand the forest governance process, the power structure and the roles of the different actors. Current decentralization theories were revisited to enable holistic and comparative understanding and to link the theories with empirical data.

The qualitative data were incorporated along with the quantitative information. The latter provided quantified evidence of the qualitative statements and were useful for cross–checking information. As far as possible, I have retained the respondents’ original ideas whilst writing this dissertation.

3.8 Ethical considerations

As the research aimed to reveal the governance structure and power redistribution in forestry, it was important to carefully and continuously reflect on the ethical implications of the research activities. The key is to avoid risk and harm to participants and to maintain honesty and transparency while obtaining accurate data and in producing and treating information elicited from them,. The concerns raised by the ethical committee are addressed below.

The focus groups and interviews always started with an introduction to the objectives of the research and the purpose of the specific activity being undertaken. Participation in the research was on voluntary basis, and all participants were asked for their consent to provide information and let me use it for the stated purposes and objectives. I explained clearly to the participants what would happen to the information they provided and made it clear that they could withdraw at any stage of the research without having to account for themselves in any way. I assured them that their names would not be used, other than for the organization of the raw data, and all information pertaining to them would remain my property and would not be used for any purpose except the execution of this study. Keeping the participants' information confidential is a way of avoiding the result that might have influence to individuals. With more than ten years' experience of working in China's forest policy, I was able to build strong social relationships and trust, not only with forest officials but also with the villagers at the field sites. The results of the research were returned to the village after the fieldwork in the form of a summary report to be shared with the local government, the individuals involved in the research and other stakeholders.

There was no payment to research participants except for their transport costs to the place of interview where necessary. However, food was provided during or after the focus group discussions and mini-policy-review workshops, as these activities took a considerable time. In addition, I gave individual villagers photographs of themselves as gifts when I visited them after finishing the fieldwork.

3. 9 Conclusion

This chapter has discussed the methodology applied in this research, beginning with the detailed research design, outlining the strategy for applying theoretical considerations in empirical research. It has highlighted the strategy applied to conducting a multiple-level analysis of governance structure and policy implementation, and the rationale and criteria for the site selection. The site selection took into consideration social, ecological, ethnic and economic variables. Also, the feasibility and manageability has been account for so as two villages has been selection. I have described the village profiles.

This research used both qualitative and quantitative approaches to the data collection and analysis. Quantitative methods were applied to generate information related to land use and land cover change, forest dynamics and household attributes gathered from spatial dataset development and household surveys; qualitative data were obtained via interviews, focus groups and PRA to collect different actors' notions and

visions of the forest, local power relations, institutional arrangements and governance structure. The analysis was performed both quantitatively and qualitatively for a holistic perspective. Finally, the chapter has presented the ethical considerations throughout the process of this research. The following chapter concentrates on the local profile and background from a historical perspective to obtain an overall picture of forest transition, institutional change and local livelihood dynamics.

Chapter 4

Forest transition, institutional changes and livelihood dynamics in upland villages of Yunnan, Southwest China

4.1 Introduction

China's forest has undergone a huge transition from net deforestation to net forestation in the last two decades (Rudel et al. 2005, Mather 2007, Xu J.C. et al. 2007) together with the introduction of a series of agricultural reforms. Its forest coverage has increased from about 8.6% in 1950 to 20.4% in 2010 (SFA 2010). As a key Land Use and Land Cover Change (LUCC) process, China's forest transition has attracted considerable attention from researchers whose studies recognize the contribution to this impressive forest recovery through its improved implementation and enforcement of forest policy and laws and vast investment in afforestation (Rozelle et al. 2000, Li 2004, Chokkalingam et al. 2006). The LUCC is not only an environmental issue; social and political factors also play a crucial role in driving the changes. Research therefore requires a critical analysis of human decisions regarding LUCC from the political economy perspective (Hersperger et al. 2010). However, understanding local dynamics and how human agency has been driving the change in China and the quality of its forest transition have been neglected by researchers. For research on forest decentralization in particular, a historical understanding of the environmental and socioeconomic change in China is critical.

This chapter presents the historical path of the forest transition, institutional change and local livelihood dynamics in two villages in upland Yunnan as background to subsequent chapters examining the key forest governance fields. It also provides a national historical background to enhance the understanding of macro and micro

environmental and social economic change. The chapter has seven major parts: the next section immediately provides an overview of institutional change in agriculture and forestry in China since the establishment of the nation-state. Then I present the history of the study villages, with a focus on key historical events in the villages and local dynamics in response to macro-institutional changes. Afterwards, the results of LUCC in both study villages are presented and local livelihood dynamics outlined for 1989, 2002 and 2010, years in three periods. A discussion and conclusions complete the chapter.

4.2 Institutional change in China since 1949: an overview

Over the last 60 years China has seen several dramatic changes leading to the agrarian transformation that has fundamentally changed the local environmental and social landscape. The institutional changes and rural policies affecting hundreds of millions of rural peasants are a major concern of politicians. There are three main phases: 1) Mao's collectivization era, 2) post-Mao land tenure reform, 3) Post-Deng's new forestry policy and local democratization.

4.2.1 The Mao era (1949-1978)

Events in the Mao era (1949-1978) had a huge social and institutional effect. The first land reform (1947-1952) redistributed ownership rights. This eliminated the biggest inequalities in property ownership at village level while affirming the ownership rights of individual cultivators (Selden and Lu 1993, Ho 2001). It promoted a changeover from feudal to socialist methods of grain production by farmers and the contribution of the labour force to the establishment of the Chinese nation. This reform enhanced farmers' access to land and increased social equity.

Mao's agrarian policy continued through collectivization from 1955 to 1978 with the abolition of private land ownership. Formal ownership rights to land and other means of production passed from individuals to collectives organized at village or village subunit level. Since that time, formal ownership rights to land had been vested in collectives (see Selden and Lu 1993, Hu 1997). The collective system controlled

which crops farmers grew, the availability and distribution of inputs, the price of inputs and crops, and marketing. An important complement of this collective state control of land rights was private plots (*ziliudi*) (Selden and Lu 1993). Rural households were allowed to cultivate about 5 percent of local cultivable area where they could choose which crops they grew and what inputs they applied, and whether to consume or market their produce. Collectivization also applied to forest land.

The radical communist ideology of “Man Must Conquer Nature” and the commune system fundamentally changed the social system and institutions for natural resource management, breaking down traditional practices and customary institutions. The Ministry of Forestry was organized and run principally as a supplier of raw materials for industry, and this led to tremendous over-exploitation of forest (Harkness 1998). The Great Leap Forward in 1958 and the Cultural Revolution from 1966-1976 were the two key periods in which widespread deforestation occurred, with massive amounts of timber harvested to support industrialization, that including huge areas of forest were logged to fuel backyard steel smelters and build communal mess halls (Menzies 1994, Yin 1998, Shapiro 2001, Chokkalingam et al. 2007).

Simultaneously, the Great Chinese Famine further pushed the extensive use of marginal forestland which is low productivities for agriculture. In the late 1960s and early 1970s, campaigns for local self-sufficiency in grain led to large-scale deforestation of sloping lands for cultivation of corn and wheat (Harkness 1998). However, ambitious tree-planting goals were set annually, but afforestation was carried out principally through mass-mobilization style campaigns, and survival rates were low (Harkness 1998, Rozelle et al. 2000, Chokkalingam et al. 2007, Mather 2007, He et al. 2012). The estimated net forest loss was 6.64 million ha in 1950-1962 during Great Leap Forward and 6.58 million ha in 1973-1981 during the Cultural Revolution (Chokkalingam et al. 2007).

In the name of civilization, the Chinese government attempted to bring ethnic minorities and people living on the geographical periphery to the country under central control after the founding of the People’s Republic of China (Harrell 1995). This

included settlement programs converting forestlands into arable land and an attempt to ban shifting cultivation. The demand for agricultural land and timber felling for human settlements in remote area were the main cause of forest loss in Mao's era (Menzies 1994, Xu J.C. et al. 2007), when this sharp decline of forest area occurred.

4.2.2 Post-Mao land reform (1978-1998)

The lessons learned in the radical Mao era led to Chinese government reform based on individual household land tenure in the early 1980s. Farmland was reallocated to peasant households on the basis of family size. Contracts made with collectives gave farmers the right to farm contracted lands (z*heren tian*) for 15 years through the Household Responsibility System. Such land is distinguished from the private plots (*ziliu di*) to which farmers were given rights in the 1950s. The Household Responsibility System is a tenant farming system which combines collective ownership of land with private ownership of capital and household use-rights (Hu 1997).

This system has promoted decentralization and deregulation (see Zuo and Xu J.C. 2001, Xu J.C. and Ribot, 2004) as the government allows farmers to make all decisions related to production, although they must fulfil state procurement quotas for grain and cotton. Households throughout the Chinese countryside have become semi-autonomous producers operating within a collective framework (Selden and Lu 1993). This expanded role of rural households and the reduction, and in many regions the elimination, of collective agricultural production has restructured land ownership rights across rural China.

The consequences have been mostly positive, leading to rapid economic growth that has lifted millions of Chinese out of poverty because farmers have incentives to produce crops (see Zhao and Zhang 1998, Zhang and Zou 1998). Also, market liberalization gives farmers more opportunities to market their surplus produce after fulfilling their government quotas (Zhang and Zou 1998, Yabuki 1995).

Along with the redistribution of agricultural land, the government also reallocated forest land through the Two Mountain System, which recognises freehold forestland (*ziliu shan*) and "responsibility forest land" (*zheren shan*). Freehold land is generally poorly forested or barren and is relatively close to village settlements. Such land was allocated to farmers to grow trees on an unlimited time basis for their subsistence needs (Zuo 1995). Responsibility forestland is leased to households or collectives to encourage forest conservation; the length of contract for responsibility land is negotiated between village and household (Zuo 1995).

The Two Mountain System has not worked as well as the Household Responsibility System in agriculture sector. This attempt to decentralize forest management and improve security of tenure on forest land has not solved the problem of forest degradation. Rather, as observed in the literature (see Liu 2001, Miao and White 2004), the incomplete implementation of forest redistribution gave farmers a bad sense of loss of ownership of forestland, and the later launch and application of a restrictive harvest quota system in 1985 again manifested in frequent forest policy changes that have caused further forest tenure insecurity. As a result, farmers lost their interest in long-term investment in forestry and continued to convert forest for agriculture, from which they can profit. Studies report a decline in forest area as market forces have led to many being cut down for cash income (e.g. Xu J.C. et al 2005b, Zhang 2003, Zheng et al. 2001). This has led to social conflict over access to forest resources. The transfer of forest use rights and management responsibility to local farmers in an insecurity matter was not enough to regenerate the forest, and environmental degradation continued (Xu J.C. et al. 2005b), whereas state investment in afforestation remained in the form of annual mass tree-planting campaigns, although with a very low tree survival rate (Rozelle et al. 2000, Mather 2007).

To sum up, the Household Responsibility System and the Two Mountain System were the main land reform strategies carried out after the Mao era. This period is referred to as the Deng era, as they were carried out under the leadership of Deng Xiaoping. The

Household Responsibility System motivated farmers to produce crops and led to rapid economic growth. The decollectivization of benefit distribution and land access and the decentralization of decision-making strengthened farmers' access to land and forestry resources. This, however, resulted in agrarian transformation and social differentiation (e.g. Yang 1995, Fan 1997, Oi 1999) as well as environmental degradation (Muldavin 1996, Hu 1997). While the decollectivization allowed for individual development, lack of access to information, policy support and socioeconomic differences widened the gap between rich and poor.

At this time increasing environmental degradation became a serious problem. The overexploitation of land (Hu 1997) and forests (Zheng et al. 2001), and the short-sighted management of natural resources were encouraged by short tenure periods and institutional ambiguities (Ho 2001). People who worked their land irresponsibly, exploiting it for short-term gain, gained more than those who worked it responsibly. As there is an increasing conflict between the state goals of economic development and environmental substantiality (Sturgeon and Menzies 2006), several institutional change particularly in forestry was taken place in later 90s.

4.2.3 Post-Deng era: New forestry policy and local democratization (1998 to present)

Two decades of Deng Xiaoping's opening and reform policies had serious negative impacts on the environment (Muldavin 1996, Hu 1997, Zheng et al. 2001). The government that followed Deng Xiaoping's launched environmental protection policies such as the Policy on Nature Reserves and Biodiversity Conservation as well as a large-scale forest rehabilitation program which aims to maintain the country's rapid economic growth and simultaneously overcome its serious environmental degradation.

There has been massive investment in forestry over the last ten years including large-scale afforestation, a major shift from state and collective ownership to private land management and the rapid development of the Chinese forest sector and its

capacity to compete in the international market (Wang et al. 2008). In 1998, following a devastating flood of the major headwaters of the Yellow, Yangtze and Songhua Jiang rivers, the government introduced the Natural Forest Protection Programme (NFPP), widely known as the logging ban, prohibiting commercial logging at the head of watersheds. Together with large-scale investment in afforestation, the NFPP take state forest farm at priority, but then expand to collective/private forest particularly in Southwest China (Zhang 2000, Wang et al. 2008). In 2001, the Chinese government has begun implementing the world's largest and most generously funded afforestation program, the Sloping Land Conversion Program, or "grain for green", to convert marginal agricultural land to forest, affecting millions of mountain-dwelling communities (Zhang et al. 2000, Xu Z. et al. 2004). The SLCP aims to reduce erosion and soil loss and promote more sustainable agriculture by converting agricultural land on slopes exceeding 25° into forested land, paying compensation to affected farmers. This policy has created a need to find alternative food and income sources for households that have given up farmland. The SLCP is associated with bundles of regulations that regulate peasants' use of land (discussed more details in Chapter 6).

These programs made a key contribution to forest transition and entailed vast investment by the Chinese government. China's forest plantation area grew by 2.6 million ha annually from 1990 to 2000 (SFA 2004), and doubled from 2000 to 2005 (FAO, 2007). The annual average forest cover increasing accounted for 2.2% between 2000 and 2005 (FAO 2006). Up to 2008, plantation forestry accounted for about 31.8% of total forest area and is the highest total area globally (SFA 2010). Implementation of the logging ban has enabled forest regeneration and conservation.

More recently, the Chinese government has promoted mobilizing the rural community to participate in organizing their own local affairs and rights-based approach to resource management. In 1998 the Organic Law of Village Committees was passed, and its widespread implementation began in Yunnan in 2000. The law aimed to establish a new governance system which townships, as the lowest level of state administrative power, are legally empowered to administer, while village committees

act as a villagers' organization entitled to self-governance. With the introduction of the direct election system, village committees were empowered with full autonomy in their own affairs.

Besides reforming rural administration, the Chinese government initiated the second round of collective forest tenure reform from 2003. The first round in the 1980s had failed to clarify the right to use and benefit from collective forest. The new reform is designed to improve forest management incentives by transferring forest use rights from village collectives to individual households, which in turn can legally transfer forest use rights, providing a foundation for the consolidation of forest resources into larger holdings for improved economic management of forest (Su et al. 2009). The reforms confer decision-making authority regarding whether and how to allocate collective forest to elected village representatives; any such decisions must be approved by a two-thirds majority of these representatives.

In sum, the institutional change of the Post-Deng era manifested a contradictory phenomenon. On the one hand, central government is continuously promoting local democratization and the right to local decision-making and resource use, while on the other it also directly regulates local land use and restricts harvesting from forest to achieve its goal of environmental protection. The central state's desire for local participation and decentralization, interfaced with its efforts to achieve its seriously challenging of environmental goals, create the local dynamics shaping the landscape and the social transformation discussed below.

4.3 The history of the villages

Baoshan prefecture has a long documented history that goes back to the Yuan Dynasty (1279-1368), when inland Chinese migrated there from Nanjing city in Zhengjian province as war refugees. The prefecture was regarded as Yunnan province's key grain production area, and was known as the "grain barn in middle of Yunnan". It produced rice and corn in the valleys, and corn and buckwheat as the major crops in mountainous regions. The farming system underwent a dramatic

transformation along with macro-socioeconomic change. This section presents the history of the two case-study villages in Baoshan prefecture. In conjunction with the macro institutional change, local history provides an insight into the local environmental and social transformation.

4.3.1 Pingzhang Administrative Village

Pingzhang Village is situated in Yangliu Township, Longyang County in Baoshan prefecture. The administrative village consists of five natural villages inhabited by people of the Yi and Bai ethnic groups. The Yi primarily settled there about 300 years ago after moving down from Chuxiong prefecture and Sichu province; the Bai arrived about 50 years ago under a resettlement project due to the construction of a water reservoir in their previous village; they are indigenous to Yunnan, with most settled in Dali Prefecture, close to Baoshan. Ethnically, both groups are regarded as less-developed groups as their geographical located in mountainous area of West China (Xu J.C. and Mikesell 2003).

The Yi people practiced shifting cultivation and grew buckwheat for a long history until the commune system introduced the terracing technique in 1960s. This allowed farmers to cultivate rice on steep mountain slopes, and the adoption of a self-breeding variety made rice production possible at high elevations. The rice fields were rain-fed due to poor irrigation infrastructure. Low production resulting from poor soil fertility and lack of irrigation forced the farmers to open up more closed canopy forest for agricultural activities to ensure their households' food security in the 1970s and early 1980s.

The resettlement of the Bai people also caused substantial forest loss as they cleared it for housing and agriculture, as recalled by the elders. As the Bai people came later, they were allocated land at a higher elevation in Pingzhang territory where agriculture is not productive and they developed animal husbandry for their food security. To date, the Bai village still has the greatest number of goats, cattle, mules and horses among the five natural villages. The lack of grazing land and expansion of livestock numbers

is threatening the forest conservation and regeneration.

Deforestation also took place during the Great Leap Forward in 1958, when people logged for wood to burn to refine iron and steel. The village elders said that the Great Leap Forward campaigns brought about the loss of more than two thirds of local forest, since Pingzhang supplied wood not only for the consumption of Yangliu Township but also for Baoshan city due to easy road accessibility and the short distance from the village to the town.

After several decades of radical social and political movement, collectivization collapsed in the post-Mao era. In the 1980s, the initiation of the Household Responsibility System and the reallocation of collective farming land to individual households provided an incentive for farmers in Pingzhang. To fight with food shortage, this policy allows farmers to claim use rights to forestland that they converted for agricultural production. Consequently, a significant area forest was converted, mainly for the cultivation of corn and buckwheat .

In 1982, the forest sector adopted the same idea to allocate collective forestland to individual households by establishing responsibility for forest, aiming to encourage farmers for tree plantation and protection. However, due to unclear ownership and length of tenure arrangements this led to unexpected overharvesting of forest and the Chinese government launched a logging quota system three years later to control the rate of deforestation. In Pingzhang only a third of forest was redistributed, as most people wanted to keep the collective forest for communal use. Also, with the launching of the restricted quota system, government efforts at forest redistribution ceased, leaving the first forest tenure reform of 1980s incomplete. The second round of forest tenure reform was implemented in 2006 to secure and clarify individual forest ownership. For this second reform, central government called for the individualization of forest property rights to redistribute collective forest to individuals and issue forest certificates allowing the transfer of forest rights. This reform required to involve local decision-making throughout the process, from planning to the delineation of boundaries and forest titling. However, in practice this reform was implemented

differently, as discussed in Chapter7.

In the late 1980s, the Baoshan Forestry Department started large-scale afforestation across the prefecture in response to the rapid deforestation and forest degradation of the past two decades. With financial support from central government, farmers from Pingzhang received free seedlings for reforestation and were encourage to plant trees on low-yield agriculture at higher elevation. The forestry department also used aerial seeding for low–cost, rapid afforestation of barren hills. The main species planted was pine (*P. Kesiya, P. yunnanensis, P. armandi*), as it is relatively cheap, easier for mass production and fast-growing (He et al. 2012). The biggest afforestation activities took place under the SLCP after 2000. In Pingzhang, it involved more that 300 households with forest plantations of 39.83 ha and 38.12 ha in 2003 and 2006 respectively, not only changing the landscape but also causing social transformation in terms of livelihood strategies. The SLCP offered a more competitive compensation scheme for planting more diverse tree species, and walnut (*Juglans sigillata*) and pear (*Pyrus pyrifolia*) were selected for Pingzhang Administrative Village. A large area of terraced land was included in the SLCP, and other terraced land was converted to dry land for corn production or self-initiated walnut plantation, due to water scarcity.

In 2002, the World Agroforestry Centre (ICRAF) introduced a program for poverty reduction and forest conservation in Pingzhang covering a wide range of agriculture and forestry activities. The centre adopted a participatory approach to rural development to facilitate communication and exchange between farmers and local forest officials. With a particular focus on forestry, the Centre provides significant support to complement the state's SLCP, including training in walnut plantation and management, agroforestry development for SLCP and other capacity-building activities. The Centre has helped to develop forestry for conservation through a biogas program and a large area of afforestation with a wide variety of tree species including Pine (*Pinus armandii, Pinus yunnanesis*), alder (*Alunus nepalensis*) and walnut (*Juglans sigillata*).

Administratively, although the Organic Law of Village Committees was passed in 1998,

its application in Yunnan province took place after 2000 (He et al. 2007). In Pingzhang, although the villagers immediately started electing their preferred village head, the village party secretary, normally the most powerful person on the village committee (Su and Kahrl 2007), was still appointed by the higher-level township government. Understanding the limits of local democratization in village elections led provincial government to structure a new political arrangement for village administration (Li 2002, He et al. 2007). As stated in a 2007 policy document, “Improving Village Committee Elections in Baoshan”, the reform automatically enables the elected village head to become party secretary as long as he/she is party member. This aims to transfer more meaningful decision-making power to the farmers and village committee and create greater village autonomy. Thus Pingzhang has had a “real” elected village head only since 2006, who has helped farmers to obtain government support for several projects including infrastructure and forest and agricultural development under the central government program “Constructing a New Socialist Countryside”.

4.3.2 Xinqi Administrative Village

The Xinqi Administrative Village is located in Zhonghe Township, Tengchong County in Baoshan prefecture. It comprises five natural villages with twelve production teams, and the inhabitants are all Han-Chinese. The village was founded by three brothers who arrived there for the hunting about 300 years ago. They found that its rich forest cover and resources provided important resources for food and habitation and settled in Xinqi, hunting and gathering and depending on the forest and forest ecosystem. They extracted forest products including pine nuts, fungi and other non-timber forest products for their subsistence. These three households and their relatives used the forest and other arable land in a collective arrangement. The village expand with also other immigrates, while all people depend on forest as an important resource for their livelihood. In 1958, collectivization introduced the commune system that withdrew all private property, including arable land and forest, for collective ownership by cooperatives, which could freely use these resources. In turn, the cooperatives were responsible for allocating their grain and produce to all member farmers.

In addition to forestry, the farmers in Xinqi had a long history of shift cultivation in a rotation-based practice growing buckwheat and corn due to the poor soil fertility and cold weather in the mountainous area. The rich forest provides sound ecosystem functions in terms of hydrological processes so the village has a significant paddy field area at the lower elevation which supports food security. The significance of provisioning and regulating services and goods provided by the forest ecosystem require special attention to forest management from local farmers. Although a great amount of forest was destroyed during World War II and the Great Leap Forward campaign, the local farmers have a strong incentive for investment in afforestation. In 1962, the village established the first collective forest farm for afforestation and forest management, starting by planting about 167 ha of fir (*Taiwania flousiana*). Another four collective forest farms were formed in 1978 and planted 400 ha of fir (*Tsuga dumosa*) with a loan from the local bank. During the 1980s-1990s this grew to 17 collective forest farms with a total area of 1,667 ha and more diverse species were planted, and the villagers have continued to manage these forest farms up to now. They have made a great contribution to afforestation and forest conservation; Xingqi has 65% forest coverage, of which the plantation accounts for 80%, as the village head stated.

While several changes to forest tenure policy occurred across China, the Xinqi adapted to create their own special arrangements. The forest was collectively owned in the collectivization period, and redistribution of forestland to individuals was initiated by the village in the 1980s. Formal forest redistribution started in1982 with the Two Mountain System policy to differentiate private forest and contracted responsibility forest from collective forest. However, as mining and the overharvesting of timber after the forest redistribution caused serious deforestation and forest conflict, in 1985 the villagers reached a common agreement to return the contracted responsibility forest to collective ownership and management. Since the logging quota system was also applied during this time, this village's self-initiated recollectivization has significantly contributed to forest regeneration and conservation.

Over the years, efforts towards afforestation and forest protection greatly improved forest quality and economic value. The administrative village began to redistribute the forest again in 1997. Following the lesson learned previously, the forest was allocated in the form of shares entitling each individual was to 0.1533 ha. The allocated forest was delineated and given to different collective forest farms who took responsibility for its management and harvest, and the distribution of benefit from harvest was discussed among the villagers. The benefits were either distributed to individuals as money or invested in public goods. Over the years, the village used the profits from forest for infrastructure and social development, including a school, a clinic building, elders' centres and a roads, as well as social insurance for all villagers. In 2004, Tengchong was selected as pilot site in Yunnan Province for the second national forest tenure reform. As farmers prefer the previous tenure arrangement, the key focus of this reform in Xinqi is forestland certification and clarification.

Administratively, Xinqi has separations of the responsibility between forest management and village administration since the first forest farm was established. Although village elections were introduced in 2000, Xinqi began electing a head of collective forest farms since the 1980s. This initiative to take action for grassroots democratization has balanced the power of village committee, and the collective forest farms are still under the leadership of the administrative village. This political arrangement has pushed the village committee to be downwardly accountable to farmers, as the collective forest farms control considerable resources. The arrangement has been recognized by higher-level township government, strengthening links among village head, township officials and collective forest farms and enhancing the capacity of the village committee. In 2000, Xinqi's elected village head stepped out as more powerful person against to appointed Party Secretary, when village election first implemented. The village's successful forest management and conservation have attracted government investment in the forest, including SLCP implementation in 2002, 2003 and 2005, a provincial program of walnut plantation in 2009, a prefecture program of camellia plantation in 2010 and other sivilculture

programs to improve forest quality.

To summarize, Pingzhang and Xinqi have undergone dramatic change due to the impact of various forest policies. Xinqi has a stronger local institution and self-organization in afforestation, forest conservation and forest distribution. More importantly, the difference between the local institutions in these two villages and their links with local government have shaped the governance of forest in various ways that I examine in subsequent chapters.

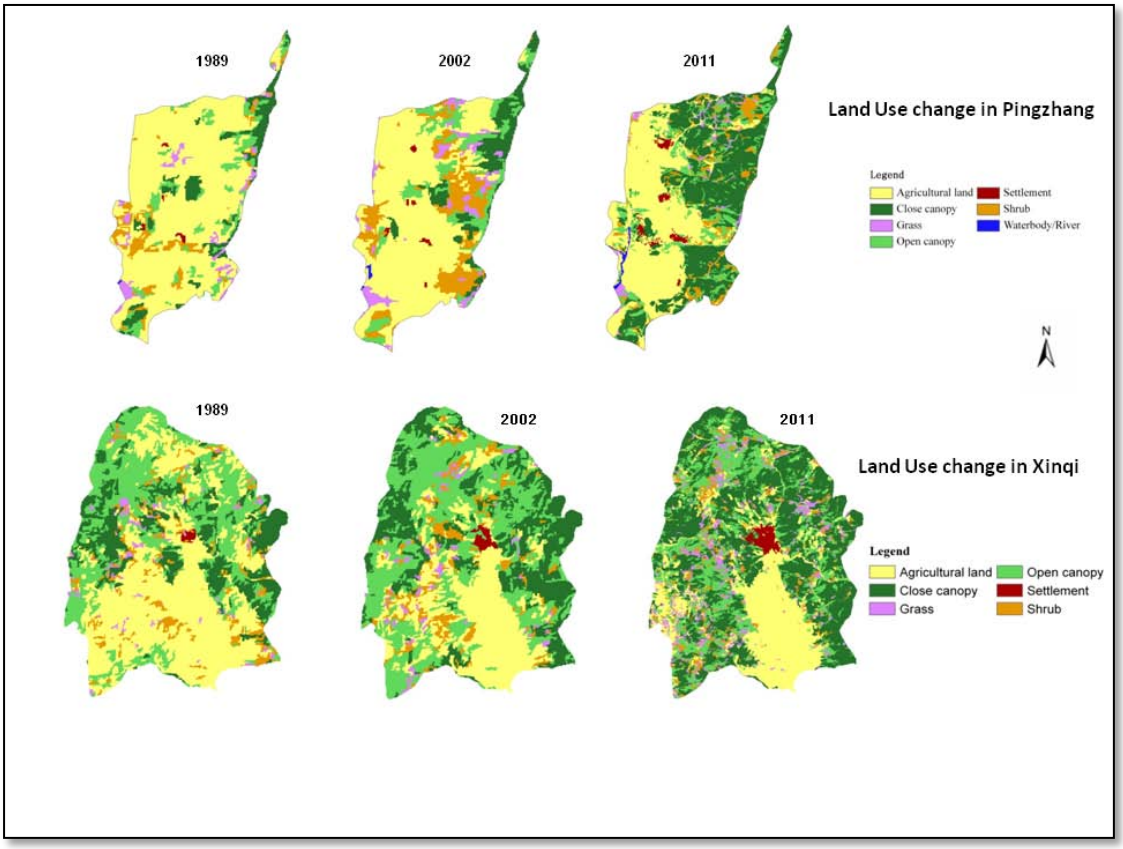
4.4 Land cover and land use changes in the studied village

Both villages have undergone dramatic land use changes and extensive forest transition in the last several decades, as shown in Table 4.1 and Figure 4.1. In Pingzhang, forest coverage increased from 18.23% in 1989 to 22.26% in 2002 and 49.48% in 2011. However, a significant decrease in agricultural land area began in 1989-2002, even before the introduction of SLCP, reducing agricultural land accounted for 14.97% of the total area. Most of the agricultural land was abandoned. The land was converted to grow shrubs or tea, which accounting for an 8.63% increase during this period. As a result, the forest increase only accounted for 4.37% and the increase in closed canopy forest by 1.37% and open canopy forest by 3.07% that is considered a low rate. Since the SLCP, significant conversion of agricultural land continues, reducing agricultural land to 17.04% of the total area. A number of shrub and grassland as abandoned agricultural land has also incorporated into SLCP. The ICRAF afforestation program, also begun in 2003, mainly focused on this village in providing quality seedlings for tree plantation on barren land. The different investment programs contributed greatly to afforestation, and the forest increased by 26.75%, with closed and open canopy forest making up 35.71% and 13.77% of the total area respectively.

In Xingqi there was a significant increase in forest coverage from 46.65% to 62.08% of total area in 1989 to 2002 respectively. It stabilized at 62.97% in 2011, with closed canopy forest making up 40.37% of the total area. Xinqi had the largest-scale

agricultural conversion before the SLCP in 1989-2002, with 926.64 ha of agricultural land lost, accounting for 17.42% of total land area. Most of the agricultural land was converted to forest. There was a 15.43% increase in forest cover and a 7.34% and 8.09% increase in closed and open canopy forest respectively in 1989-2002. After the SLCP, the reduction of agricultural land only accounted for 3.54% of total land area, as 188.34 ha. Forest quality has improved with an increase of 15.62% of total area in closed canopy forest, although the total forest coverage is stable in 2002-2010. Table 4.2 shows that open canopy forest has decreased by 14.7% because a significant amount of logging took place in Xinqi around 2004-2008 to build the school and road, as well as for other social benefits. After the mature forest was logged, the newly-planted open forest was closed.

Figure 4.1 Land use and change in Pingzhang and Xinqi, 1989, 2002, 2011



Note: Interpreted by Rong Lang and Jun He

In sum, farmers start to abandon their agricultural land after 1989 when the problem of food insecurity problem was resolved. However, the two villages took different

directions in their use of agriculture land. In Pingzhang, most people abandoned the land and some started tea plantations, but Xinqi engaged in self-organized afforestation that contributed to a considerable increase in forest cover. This was when Xinqi initiated its own forest redistribution arrangement, encouraging farmers to plant trees. Afterwards the SLCP gave both villages the opportunity to diversify their agricultural systems with further tree plantation. The overall LUCC results show that Xinqi has better quality and quantity of forest with coverage of 62.39%, of which 40.37% is closed canopy, while Pingzhang's forest has coverage of 49.48% with 35.71%.closed canopy.

4.5 Livelihood and population dynamics after the 1980s

Livelihoods have also undergone dramatic transformation in Pingzhang and Xinqi since the founding of the People's Republic of China. The radical collectivization required collective action for contribution and distribution that led to low productivity and food insecurity. As the most-interviewed elder stated, people became lazy in the commune system and never had enough food. Deng's market liberalization and land reform provided a strong incentive for farmers and food security was reached; farmers began to produce a surplus for the market. The village records from both villages show the dramatic increase in agricultural output and income since the 1980s (see Figure 4.2). More recently, there has been a clear move in local livelihoods from subsistence to market-oriented production.

Table 4.1 Land use and cover change in Pingzhang and Xinqi, 1989, 2002 and 2011

Land use and cover change	1989		2002		2011		1989-2002			2002-2011		
	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area (ha)	Percentage (%)	Area change	Change (%)	LC index (%)	Area change	Change (%)	LC index (%)
Pingzhang												
Closed canopy	133.11	9.00	153.36	10.37	528.25	35.71	20.25	1.37	1.17	373.71	25.26	27.08
Open canopy	136.44	9.23	181.89	12.30	203.66	13.77	45.45	3.07	2.56	22.09	1.49	1.35
Agricultural land	1053.81	71.27	832.41	56.30	580.55	39.25	-221.40	-14.97	-1.62	-252.05	-17.04	-3.36
Settlement	5.85	0.40	8.37	0.57	23.84	1.61	2.52	0.17	3.31	15.47	1.05	20.54
Shrub	93.6	6.33	221.22	14.96	102.93	6.96	127.62	8.63	10.49	-118.53	-8.01	-5.95
Grass	55.17	3.73	78.39	5.30	33.16	2.24	23.22	1.57	3.24	-44.67	-3.02	-6.33
Waterbody	0.54	0.04	2.88	0.19	6.86	0.46	2.34	0.16	33.33	3.98	0.27	15.35
Xinqi												
Closed canopy	925.11	17.39	1315.53	24.73	2147.37	40.37	390.42	7.34	3.25	830.9	15.62	7.02
Open canopy	1556.28	29.26	1986.75	37.35	1202.05	22.60	430.47	8.09	2.13	-782.1	-14.70	-4.37
Agricultural land	2365.47	44.47	1438.83	27.05	1251.66	23.53	-926.64	-17.42	-3.01	-188.34	-3.54	-1.45
Settlement	15.03	0.28	39.96	0.75	69.88	1.31	24.93	0.47	12.76	29.92	0.56	8.32
Shrub	347.04	6.52	403.20	7.58	280.19	5.27	56.16	1.06	1.24	-122.95	-2.31	-3.39
Grass	110.07	2.07	134.73	2.53	328.46	6.18	24.66	0.46	1.72	193.58	3.64	15.96
Mining area	0	0	0	0	39.48	0.74	0	0.00	0.00	38.99	0.73	n/a

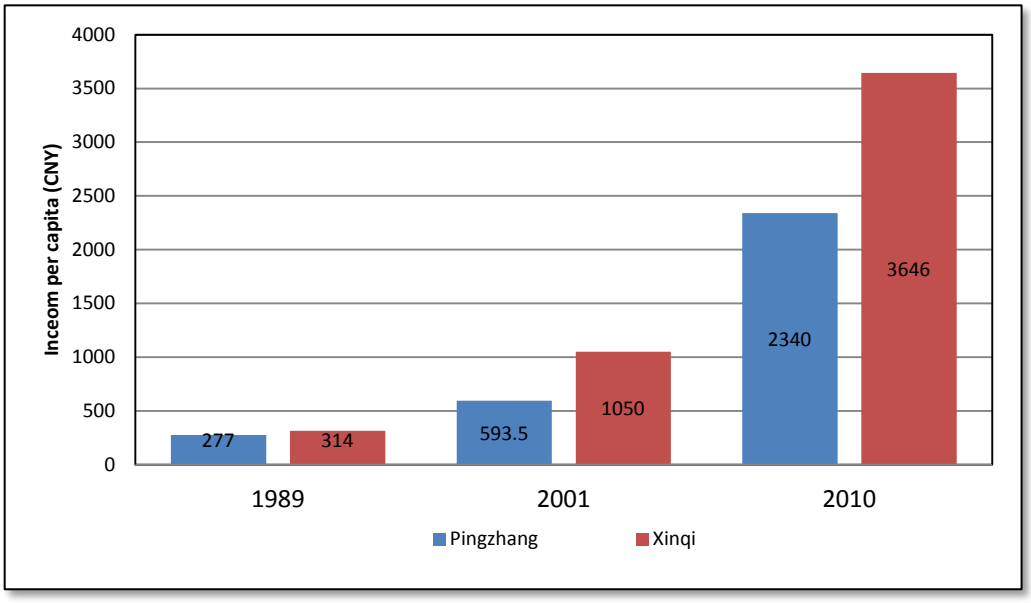
Source：Fieldwork 2001 and GIS interpretation.

Along with this tendency, the farming system in both villages changed to more intensive agriculture and forest management, with farmers making a wide range of efforts to invest more for better return in agriculture and forestry. The widespread use of high-yield varieties and chemical fertilizers significantly contributed to food security and agricultural production. Several cash and tree crops have been introduced including tobacco, coffee, walnut and camellia. Due to low productivity, buckwheat cultivation has been replaced by walnut and other trees under the SLCP. Corn cultivation are has been downsized because of the SLCP and increased production m by using new varieties of corn. In both villages, a large area of rain-fed paddy field has been converted to either tree plantation or agroforestry, as it lacked irrigation infrastructure and produced low yields. As reported by the heads of both villages, of late the farmers' "rice bowl" relies more on the external market than on subsistence farming, and the village head in Pingzhang stated that 60% of the rice consumed by 80% of households was bought rather than grown, and in Xinq, 80% rice consumption out of 90% of households is bought.

The change in livelihood dynamics and farming systems corresponds to China's overall economic growth, which has significantly benefited local income generation. Figure 4.2 shows 1000% income growth in Pingzhang and Xinqi from 1989 to 2010, which has taken both villages well above the national poverty line. The overall economic growth and reduced burden on farmers provides more opportunity for off-farm activities, which make up a significant part of local income generation. According to the village survey, 55.8% of the sampled households in Pingzhang and 51.7% in Xinqi have people involved in off-farm jobs, either outside the agricultural season or all year round. On average, 1.21 people in Pingzhang and 1.58 people in Xinqi in the sampled households engaged in off-farm work for an average of 7.19 and 9.15 months a year respectively. Economic growth and increasing off-farm opportunities are driving farmers to change their on-farm livelihood strategies. They are opting to change their focus on short-term agriculture to a combination of practices, and are willing to combine investing more in forestry as a long-term,

livelihood strategy combined with intensive agriculture as a short-term and livestock as a mid-term livelihood strategy.

Figure 4.2 Income changes in Pingzhang and Xinqi



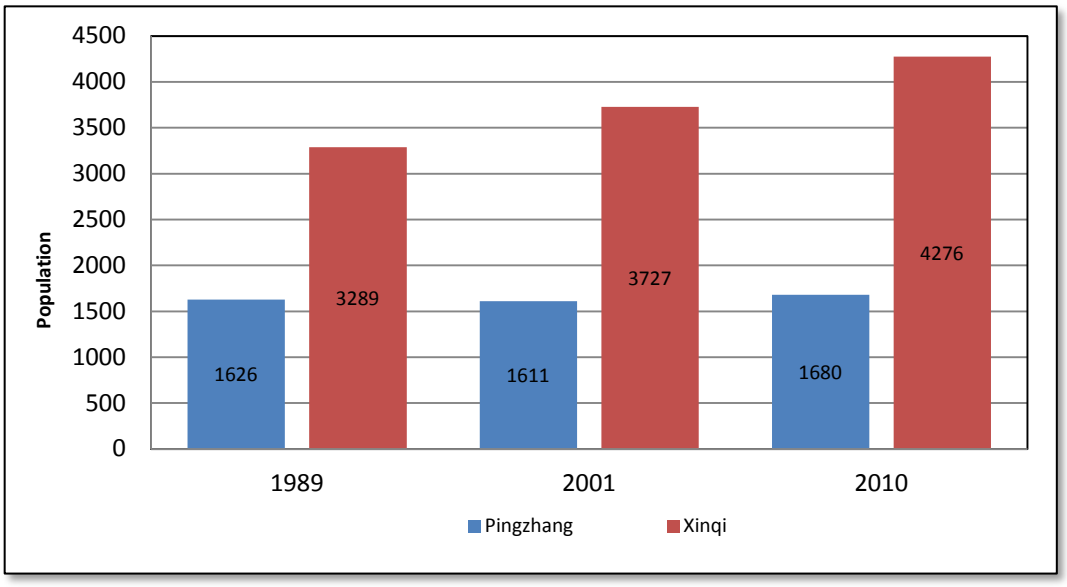
Source: Village records, fieldwork 2011.
Note: National Poverty Line was 350 CNY in 1989, 625 CNY in2001 and 1274 CNY in 2010

This economic growth also diversifies local energy use, making it possible to use biogas, electricity and new stoves in the uplands. This has significantly reduced local dependence on fuel wood, which is now mostly used for heating in winter. As the village survey shows, in comparison to the 5.32 m^3 used in Pingzhang and 6.73 m^3 in Xinqi in the past, annual fuel wood consumption per capita has reduced to 0.574 m^3 and 0.592 m^3. That is a considerable contribution to forest conservation. Cutting forest for fuel wood rarely happens now as wood from pruning and de-branching is sufficient to satisfy demand.

The population of Pingzhang has become stable in the last two decades in contrast to significant growth in Xinqi, where it has increased from 3289 in 1989 to 4276 in 2010 (see Table 4.2). Although there is a one-child policy, ethnic groups and upland rural families are eligible to have more than one child, and enforcement of the policy is weak in upland areas anyway. However, the growth rate in Pingzhang is much lower than in Xinqi as Pingzhang youth tend to migrate to escape poverty. In contrast, a

remarkable immigration took place in Xinqi due to increasing opportunities for investment in mining and timber processing, as shown in the village records.

Figure 4.3 Demographic dynamics in Pingzhang and Xinqi



Source: Village records, fieldwork 2011

4.6. Discussion and conclusion

4.6.1 Forest transition

This chapter has examined environmental and socioeconomic change in two villages. It has described the overall forest transition and remarkable afforestation of China during the last three decades. The turning point occurred around the mid- and late-1980s, and thereafter significant forest recovery started in the later 1990s. In the early stages of this transition, as shown in the case study, forest recovery significantly benefited from agricultural intensification by the application of fertilizer and high-yield varieties and improved enforcement of forest policy and law. As a result, farmers stopped opening up new forestland for agriculture and abandoned agricultural land for forest rehabilitation or tea plantation with the support of the Forestry Department. Although the overall population growth at both research sites is higher than the world average, the application of new agricultural technology has resolved the problem of food insecurity and reduced the threat to forest.

Apart from the development of new agricultural technology, the application of new

technology for afforestation has contributed to rapid forestation. Techniques such as using seedling pots for plantation have significantly improved the survival rate of young plantations (He et al. 2012). Together with the strict quality checks undertaken since 1998, nationwide survival rates one year after planting have improved from 55% before 1985 to 87% in the mid-1990s and over 90% in 2003 (Chokkalingam et al. 2007).

Another key contribution to the forest transition is extensive state investment in afforestation through various programs. China's forest plantation area increased by 2.6 million ha annually from 1990 to 2000 (SFA 2004), and doubled from 2000 to 2005 (FAO, 2007); and the implementation of a logging ban in 1999 has enabled forest regeneration and conservation.

China's overall economic growth has not only ensured enormous state investment in afforestation but also provided opportunities for diversifying livelihood strategies. Agricultural intensification and SLCP have created a rural labor surplus, and the economic growth provides good opportunities for off-farm activities. Increasing off-farm activities and migration labor, as well as expanding urbanization, have reduced local use of forestland, and the economic growth has significantly changed local energy use. All this has made a strong contribution to forest recovery and the recent new forest tenure land titling reform has substantially improved forest tenure security for local households' access for forest that made they have interests in a long term investment.

4.6.2 Institutional dynamics

Both villages have undergone dramatic transformation under the broad umbrella of macro-institutional change, but they have responded differently. Pingzhang has been through a process of land reallocation, as the resettlement program brought a new group to their territory. This added complexity to local institutional forest management arrangements. The SLCP‘s recent introduction of local un-preferred tree species and the poor performance of species in the state program, shown by slow forest growth

and less closed canopy forest from LUCC analysis. Xinqi, which has historically used the forest as a key livelihood resource, has self-organized and built local institutions for forest conservation and management. Its collective forest farms are successfully managing local forest and continuously expanding, with increasing local benefit. The state afforestation program provided an opportunity for local forestry development. Although a large amount of logging has taken place, Xinqi is keeping the forest cover at a significant level and is continuously increasing the forest area, both at faster rates than Pingzhang. The spatial data collected have clearly evidenced this comparative difference in forest cover, quality and density.

Farmers are actively involved in afforestation activities at present, due in particular to: 1) the increasing value of timber and non-timber forest products; 2) state investment and subsidies for afforestation (including under the SLCP); and 3) forest tenure reform to allocate collective forestland to individual households as an incentive (He et al. 2012). However, the local dynamics are complex in their involvement in tree planting and forest conservation. This research has found that the two villages went through different processes of land use change in the forest transition, although overall, forest cover has increased. While Pingzhang undergoing an exogenous reforestation process, Xinqi has experienced endogenous reforestation. Exogenous reforestation refers to a process of local passive participation in the externally-driven tree-planting program; endogenous reforestation refers to local-driven forest development alongside the state program. Thus while both villages have moved from deforestation to net reforestation, the quality of this forest transition in each is largely different, as shown in the LUCC analysis. The local historic and socio-economic contexts and social relationships have shaped the outcome of the LUCC. The local actors have responded to the state program and have transformed the local landscape; the land change is a result of interacting driving forces and actors, as discussed in sequence chapters.

To sum up, the Chinese government's massive investment in reforestation has contributed to an extensive forest transition and LUCC. However, its focus largely

remains on increasing forest cover without serious consideration of forest ecosystem services and regional diversity, and it is paying little attention to local dynamics and livelihoods. Local dynamics and processes have played a key role in this forest transition, with different local institutional arrangements and historical conciseness of forest management bringing about different environmental outcomes. In the context of this local background, the sequence chapters examine key forest governance fields for an analysis of forest decentralization.

Chapter 5

Simplification of timber harvest governance and its consequences in upland communities

5.1 Introduction

Among the developing countries across the world, China is particularly concerned about its forest cover and forest area and has made various efforts to protect, rehabilitate, and improve its sustainable use of the forest ecosystem. These efforts include a vast afforestation program, promoting security in the forest tenure system and improving the enforcement of forest law. Among these, the simplest and most timely measure for protecting existing forest is the legislation of logging restrictions and timber harvest quota. Although forest harvest quotas are commonly applied in other countries around the world to control timber overexploitation, China's quota scheme is unique as it is exclusively initiated by government and covers all types of forest ownership including state-owned, collective-owned and private forest (Liu 2008, Bull and Schwab 2002, Miao and White 2004).

The simplification of quantity control through a strictly implemented harvest quota system, however, has not achieved the government's original goal, and in fact has led to a number of socioeconomic problems that affect the sustainable development of forestry. The literature notes the ineffectiveness of control over logging (Zhang et al. 2006), insecurity of forest property rights (Liu 2001) and diminishing incentives for the management of collective forests (Miao and While 2004). However, as the lack of empirical data shows, little attention has been paid to the impact of the quota system on local communities. In particular, documentation of the effects of the logging quota and its local distribution on benefit sharing and forest management practices in upland communities is rare.

This chapter discusses quota governance and management in two communities of upland Yunnan and the extent of the impact of the logging quota on their populations. It questions equity issues in benefit distribution by exploring the mechanisms and institutions of quota distribution among the actors in the timber harvest and trade that affect this benefit sharing. To achieve this, I apply the conceptual framework presented in Chapter 3 to analyze power relations from perspective of three-dimensional power and accountability mechanisms in local politics. Structured in eight sections, the flow of the chapter is as follows: the next section provides an overview of the rationale for initiating a quota system and explains how the quota is formulated and distributed. Drawing on empirical data, the third section describes the quota distribution in the local communities, outlining the various legal and extra-legal mechanisms guiding this distribution. The fourth section describes timber harvesting and trade under the quota management system, and the fifth section discusses how benefit-sharing patterns are shaped by the quota distribution. Then I depict the local response to the quota system and its allocation. The following section provides a more analytical discussion based on the empirical findings and the final section concludes the chapter.

5.2 Halting deforestation: quota as a simplified solution

5.2.1 The emergence of timber harvest quota system

Timber harvest management is not new in China, which introduced a mandatory harvesting permission system in the early 1950s. As timber was a key resource for economic development and industrialization in the newly founded Chinese nation-state, the major focus in timber harvest management was on promoting a timber-oriented economy in the forest sector (Menzies 1994, Shapiro 2001, Wang and Delang 2011). The early harvest permission for timber was therefore largely remain in aims of tax collection and management (Zhang et al. 2004). It also aimed to avoid individuals' unregulated cutting down of forest for agriculture, which was regarded as a major threat to overall industrialization and economic

development (Zhang et al. 2006). Through collectivization, the government attempted to control the timber harvest by setting up a permission system and limiting all harvest activities in commune systems and cooperatives, making state monitoring and control easier (Zhang et al. 2004).

Practically, however, there was no clear scientific base to guidance behind using this system for sustainable forest management. Weak administrative structure and capacity led to poor enforcement of this regulation. The deforestation continued across the country, and over-logging in state-owned forest occurred throughout the 1950s and ’60s (Zhang et al. 2004). As a result, this attempt at legislating logging had little effect on over-logging and deforestation. Later, the Cultural Revolution further damaged not only the forest ecosystem but also the political and social systems of forest management. The processes of forest legislation and harvest management were discarded and the deforestation continued and even got worse, with forest cover shrinking from 12.7% to 12% during the Cultural Revolution (see Chapter 4 and Zhang et al. 1999).

Starting from the 1978 market reform, the forestry sector attempted to halt the serious deforestation caused by the Great Leap Forward and the Cultural Revolution. Together with the introduction of the first Forest Law, a forest harvest quota was proposed in late 1979, although it was not implemented until the 1980s. During 1979-1983, the forest decentralization reform started to redistribute forestland from collectives (villages) to individual households. Every household received a freehold (private) piece of forestland for fuel wood collection and tree plantation, and the collective forest was also reallocated as Responsibility Forestland to individual households on a contract base, entitling individuals to use and management rights. However, unsure of the duration of the new policy, the inhabitants of many villages rapidly cleared the newly-allocated forest (see Xu J.C. and Wilkes 2004). The uncertainty also came from the economic transition, market liberalization (which increased the price of timber) and forest privatization, causing farmers to harvest their forests early

(Zhang et al. 1999). On the other hand, the market liberalization allowed state-owned forest farms greater operational flexibility. A number of state-owned forest farms increased their timber production to meet the growing market demand. The expansion of timber production in state and collective forest resulted in a significant loss of forest during this period, with particularly serious deforestation and a rapid decline in forest volume in the major collective forest regions of South China (Hyde et al. 2003, Zhang 2003, Zheng et al. 2001).

As a quick solution to this shock, the timber harvest quota was reintroduced in 1985 in line with the first Forest Law, passed by National Congress, and the quota system has been fully implemented to control timber harvesting since 1987. The quota policy adopts the principle that annual wood consumption must be less than annual forest growth, and this strict quantity control of harvested volume is expected to halt the rapid deforestation. The Forest Law stipulates that except for cutting sparse trees on freehold forestland or around farmers' houses, anyone wanting to harvest timber with DBH (Diameter Breast Height) ≧5cm should apply for a harvest permit under the quota system; cutting without a permit is illegal and subject to severe punishment ranging from a fine to jail (Forest Law, article 29). To enforce the quota policy and ensure that quotas are not exceeded, investigative teams are dispatched by upper-level government agencies to local governments to check the implementation process. In addition, officials are specially sent to check the details of the implementation, concentrating on control of total consumption of forest growing stock from cuttings, total sales and total transportation of timber (Zhang et al. 2006). To monitor the entire process from harvest to production, transportation and sale, separate permits are required for the cutting, transportation and sale of timber.

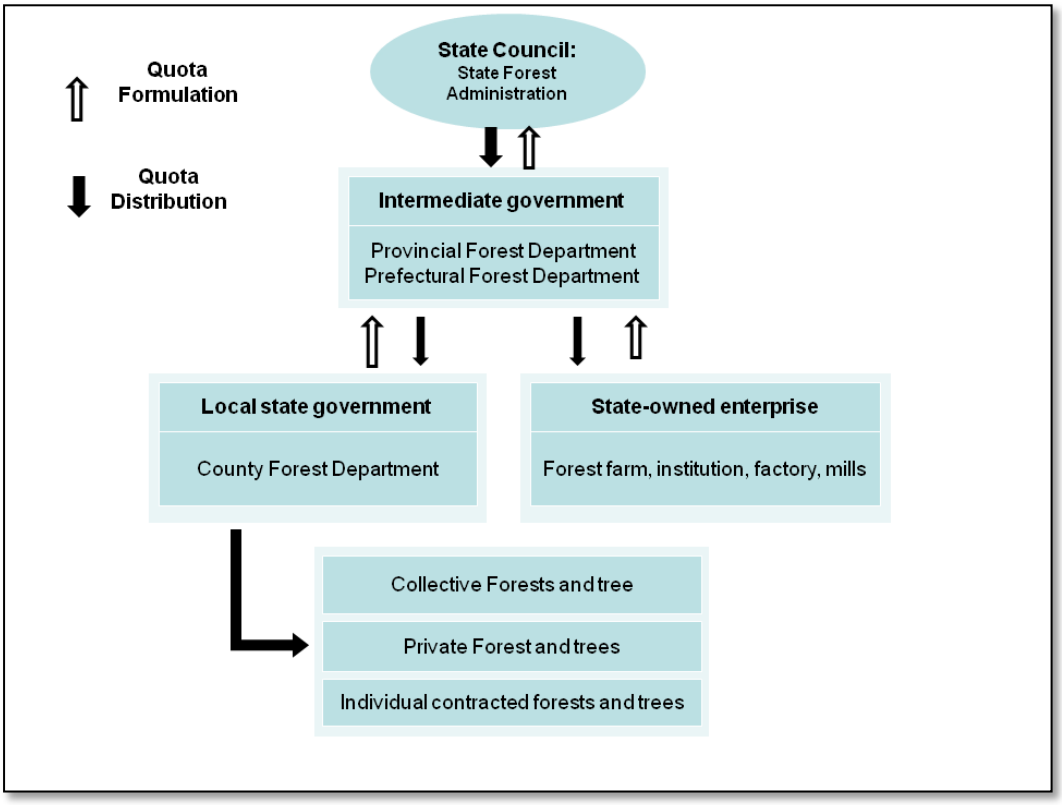
5.2.2 The quota: formulation and distribution

According to the Forest Harvest Quota Management and Timber Transportation Regulation, an quota is set once every five years, while administrative procedures from the bottom to the top of the forest sector was adopted to

determine the national quota for the whole country. The regulation identify a county as the lowest administrative body in the forest sector that can designate the quota for collective and private forests and trees, and state-owned forest farms, institutions, factories and mines are calculated as units for state-owned forest trees. Based on the national technical guidance in the Regulation, the county forest bureau, on behalf of county government, uses the latest forest resource inventory at county level to calculate annual growth and allowable cutting volume. As the regulation state, the prefectural forest department complies with the counties' initial quota proposal and then render to provincial forestry department, where the proposed quota amounts for the various prefectures in the province are pooled and adjusted according to the provincial forest resource inventory. The adjustment by the provincial forest department considers the provincial development plan for the next five years, which might include logging activities involving infrastructure development (dams, roads, etc.), improving low-productivity forest, and timber production. The adjusted proposed quotas are forwarded to the State Forestry Administration (SFA) at the national level, where further adjustments are made based on the national forestry inventory.

At the national level, the usual adjustment by SFA reduces the provincial forestry departments' proposed quotas and presents it to the State Council for final approval, as stated in the Regulation. The state council holds a meeting to discuss the rationality of the SFA's total proposed quota and then, provided there is no opposition from participants at the meeting, approves it and it is distributed from the top downwards to provinces and then to counties and other state-owned enterprises, based on their respective proposed and adjusted quotas. It is common practice for provincial forest departments to keep a certain proportion of the cutting quota for their development plans across the province. The distributed quota is a statutory figure that each county and state enterprise must not exceed for next the five years.

Figure 5.1 Quota formulation and distribution flows



Source: Adapted from Zhang 2004.

In summary, this clear measure for the timber harvest using quota control is strictly implemented and in the beginning it effectively reduced timber production by 10.05 million m^3 from 1988 to 1990 (MoF 1996). But administration for implementation and monitoring is costly and it is difficult to ensure that the quotas are not exceeded in both state and collective forest. In addition, the quota system contradicts forest law on individual property rights, causing a number of conflicts and resulting in forest degradation. As a result, logging exceeding the quota is common not only in collective forest but also on state forest farms (SFA 2002). The formulation and distribution of quotas is an extremely centralized administrative procedure with the state council -the highest decision-making body- involved in the final decision. There is no space for local communities' voices, and this causes a number of socioeconomic problems including rent-seeking and unequal benefit distribution, as discussed in the case study later in this chapter.

5.3 Local quota distribution

Once the quota is declared to the county forest bureau, its distribution to individuals in the local community is complicated and various. This section describes how the quota is distributed in two upland communities. It is common for the county to attempt to allocate a certain proportion of the quota to the township forest station, which makes the final decision as to whether local cutting applications can be approved and the quota granted. However, in many cases the county holds back a certain amount for balancing and adjustment among different townships and for large-scale logging applications. Both the townships to which Xinqi and Pingzhang belong were allocated a significant amount to logging which gives them considerable decision-making power when the community and individuals make applications.

As for the management of harvest quota, it is practical to divide timber consumption into two categories: 1) timber for domestic use, and 2) timber for trade. The quota of timber for domestic use is intended for households who want to build or repair a house. The quota for domestic use is limited to 10 m^3 for a three-room house and 2 m^3 for a kitchen and livestock housing. Most of the householders I interviewed explained that it is not difficult to obtain their quota of domestic timber as long as they provide their application with a copy of the forest title certificate stating which trees are to be cut. The township forest station grants a cutting permit when the village committee has approved the application. In both Pingzhang and Xinqi, the village committees assist applicants in obtaining cutting permits.

Obtaining the quota of timber for commercial use is different, however. The application is subjected to strict inspection and complicated procedures. The application must be for at least 30 m^3, as stated in the Harvest Quota Management and Timber Transportation Regulation. Ordinary farmers managing small-scale forest find it difficult to reach this minimum and in Pingzhang and Xinqi villages they therefore go about it differently.

In Pingzhang, it is rare for an ordinary farmer to get a quota and cutting permit to harvesting their own forest for trade. It is common for farms to sell trees directly to traders, who may come from their village or outside it. The traders have a quota for cutting, as they generally have good links and a special relationship with township forest station; some large-scale traders even have special relationship with officials in the county forest bureau. Mr. Lu is a villager who has been involved in many forest harvesting activities in Pingzhang and is the most knowledgeable person regarding the timber trade. He explained:

> *I have been involved in forest cutting and local transportation for more than 15-16 years, as I have five mules for timber transportation. But, there is almost no sample case in which we [ordinary farmers] obtain harvest quota for commercial timber directly. In general, most farmers only have a small plot that does not meet the government's basic criteria. And to obtain the quota you need to have a special relationship with township officials and sometimes you need to pay a tribute … Our small farmers cannot afford this. So farmers normally just sell their trees to the traders. Sometimes we have to contact the traders ourselves or via friends, but in most cases they come to enquire about our willingness to sell our trees. In past 15-16 years, my job has been helping with the cutting and using the mules to transport timber to the roadside. I am mostly hired by outside traders, and sometimes by Lao Huang [the ex-village head].*

Based on the household survey results, I use logistic regression analysis to compare different factors that influence families' involvement in harvesting and trading timber. These variables include the political position of family member, numbers of labor, years of education, month in off-job, income level and forest area. The results (see Table 5.1) show that family members who have a political position are more likely to be involved in timber harvesting and trade as the correlation is significant at $p<0.05$. People with a larger forest area are also likely to be involved, with a significant level of correlation at $p<0.1$, possibly because they have more timber to sell. But, forest area has comparably less influence than political position for people who may be involved in harvest and trade.

Traders build special relationships with officials in many ways. This relationship is

known as *Guanxi,*[1] and all my informants used it (see Fan 2002 for a detailed discussion of *Guanxi*). First of all, it does not have to be based on money. As a number of traders may be village officials, as shown in Table 6.1, or forest officials from another township, they start their relationship with forest officials in Yangliu Township through political links as friends. Frequent contact with forest officials fosters understanding and emotional bonds, and the Chinese often feel obliged to do business and behave favorably with friends. It is common to bring gifts such as liqueur, cigarettes, etc. and have meal together. Second, they act dependably and reliably, which strengthens the relationship. In the case of implementation of various government afforestation projects, for instance, the township forest station relied heavily on village officials to help them to accomplish their target by facilitating the implementation of the project at village level. Thus to obtain the quota, the ex-township leader said,

> *There is rare officials want to gain money, meal or gift from this [quota distribution]. But to obtain the quota you do need Guanxi (special relationship). Individual farmers only have a small area and volume of forest. That makes it difficult to obtain a quota and costly to monitor the harvesting. Somebody with good relations with an official who is able to pool forest resources in the village finds it easier to obtain the quota. Sometimes we keep back some of the quota for private enterprises with large-scale plantations.*

Distribution of the quota depends on people's ability to pool resources and their relations with officials. Having somebody in the family in a political position gives the family privileged links to forest officials and helps to build *Guanxi*. While establishment of *Guanxi* is *not* necessarily based on money, it is hard for ordinary farmers to make frequent contact with forest officials, give them gifts and have meals with them to build up an independent relationship. This access to authority enables the quota-holder to become involved in timber harvesting and trade on their own account. While the village head has the power to ask the township for the quota, they cannot offer downward accountability, which may break their

[1] Guanxi, a Chinese term referring to interpersonal connections and a cultural factor important in conducting business and pursuing a political career in China (see Fan 2002, Guthrie2009).

business. Instead, the village heads invest in building up *Guanxi* to maintain their access to authority as this patron-client relationship can ensure that they benefit from the timber trade.

The Xinqi community is well-organized in forest management (see Chapter 4), with the village committee working closely with collective forest farms. The collective farms take on the responsibility for managing not only collective but also private forest, except for the pruning as it is costly. They also build good relationships with township officials as they are achieving better forest management and afforestation in the region. Their success in forest management pays for a strong contribution to their local infrastructure development, reducing the burden on the township. This ensures good contacts and a reputation for sound forest management in the township.

Table 5.1 Logistic regression results: Factors affecting involvement in timber harvest and trade

	Pingzhang (n=43)		**Xinqi (n=60)**	
Variable	Parameter estimate (Standard error)	Pr>x^2	Parameter estimate (Standard error)	Pr>x^2
Labor	1.818(1.207)	0.132	-0.051(0.363)	0.888
Education	-0.522(0.308)	0.090	0.009(0.160)	0.955
Political position	5.622(2.729)	0.039	-0.120(0.913)	0.895
Off-farm job	1.601(1.816)	0.378	-1.235(0.737)	0.094
Income	-0.249(0.529)	0.638	0.949(0.453)	0.036
Forest area	0.98(0.054)	0.066	0.006(0.006)	0.328
Chi-square (x^2)	19.385		11.443	
Degree of freedom	6		6	
Prob. (x^2)	0.004		0.076	

Source: Village survey, 2011.

Note: The significance levels of the model are defined as 1%, 5% and 10%.

Xinqi villagers annually cut down a significant number of trees from their collective forest for their local development, and it is also common for village leaders to facilitate individual farmers' access to the quota with their application to log in collective forest. The village leaders ask individual farmers to report their

personal logging plan, then pool this with their collective logging plan and make an application at the beginning of the year that ensures that they are given priority in obtaining the quota from the township. As they have a good reputation, forest officials are likely to grant the quota and cutting permit to Xinqi, and thereafter the village committee passes some of the quota to individual farmers, as the farmers proposed. Thus, as shown in Table 5.1, political position is not an influential factor here in determining people's involvement in forest harvest and trade, as it is in Pingzhang. However, household income has a high correlation (significance level at $p<0.05$) because a number of wealthy households are deeply involved in timber processing in the village, which has five timber-processing factories. A number of farmers opt to sell their timber to their village factory rather than to outsiders.

The village head explained quota management in Xinqi:

> *Obtaining the harvest quota for individual farmers and collective forest farms isn't a big problem here in Xinqi. We normally have a good plan for forest harvesting and management, and each year we log a significant amount for sale from both collective forest and individual plots. To manage this well, we ask the individual farmers to send their plans to us and then we integrated them into our village plan. So everybody has a chance to getting some of the quota. But, of course the collective forest farm staffs do a field check to ensure that individual households' proposals for timber harvesting are eligible from the legal and environmental perspectives. Then, we normally send our plan to the township forest station a year ahead to ensure that the township can allocate the proposed quota to us […] generally we receive the proposed quota, as the township wants to support our forest development. They understand that we have a strong incentive to plant trees and trust that us regarding how much we log and how much we will plant.*

To compared with Pingzhang, the quota distribution in xinqi is performed more transparently and ordinary farmers apply for their quota first to the village committee, then the committee helps to obtain it. Good links with forest officials enable the village leader from Xinqi to propose their cutting amount early, securing the amount they propose. Their downward accountability to local

farmers ensures that the farmers continue to vote for them and are involved in the management of not only the village affairs but also, and more importantly, the collective forest farms. The historical setting of the institutional arrangement between collective forest farms and village committee enables power checks and balances. Pingzhang's quota distribution is controlled more centrally by township and county government. People's political position and personal relations with officials determine their access to the quota. Ordinary farmers are hardly able to access the quota at all because there is a lack of downward accountability from both the township and the village committee regarding meeting local harvest quota needs.

5.4 Timber harvesting and trade under the quota system

The quota allocation has shaped people's access to forest. Villagers engage in timber harvesting and trade differently in the two villages in terms of the different actors involved. This section focuses on commercial timber harvesting and trade; timber for domestic use is controlled by a simple monitoring and management procedure that prohibits trade under the quota system.

5.4.1 Timber harvest management and practice

To obtain harvest quota, people must send their application for it, with the village committee's approval and forest title certificate, to the township forest station. As the volume requested in logging applications normally exceeds 10 m^3, this requires forest officials to go to the proposed logging area to make a detailed plan and mark which trees are to be cut to ensure that the logging does not exceed the quota; they aim to control the environmental impact through selective cutting to maintain at least 50% canopy after the logging, as required by the Harvest Quota Management and Timber Transportation Regulation. Once the plan is made, a cutting permit is issued. The forest official is required to make a post-harvest inspection to ensure that the logging has followed the plan, and thereafter issues an inspection certificate for use in checks during transportation.

In Xinqi, after the forest officials have made the plan, timber harvest management and monitoring is undertaken by the village committee and collective forest farm leadership. As they are already knowledgeable and have a high reputation in the township, the village committee asks the logger to follow the plan strictly. This retains their good track record with the township forest station, ultimately ensuring further collaboration in obtaining quotas and other support. It is practically that the tree owner to seek for a buyer, as mentioned above, mostly, the buyer is locally from village to arrange the overall cutting practice. Buyers hire somebody, who may also be from the village, to fell the tree and use their own tractor for transportation to the village processing enterprise. As the village committee checks the process overall it is easier for the sellers to obtain the post-harvest inspection certificate. As the deputy village head explained:

> *We have to follow the plan strictly; that's how we build trust with forest officials and ensure further support from them in future. The village committee together with the collective forest farms play a key role in monitoring the farmers' harvesting activities to avoid exceeding quota logging. … A well-implemented harvest plan is the only way we can obtain the quota for next year.*

In Pingzhang the practice is different. As discussed above, ordinary farmers are normally unable to access the quota, and thus it is common practice for timber buyers, many of them are local village leaders, to look for trees that are mature and ready to cut. They then contact the farmer asking to buy the trees, and negotiate a price based individual trees rather than their actual volume or timber. The buyers have long experience in estimating of the volume of timber in a standing tree. Quoting for a low volume reduces the price they pay the farmer and the taxation on their quota application. A local trader explained:

> *[Y]ou really have to know how to estimate the volume of a standing tree and how much timber you can produce from it to know how much you can gain from farmers.*

When the forest officials come to make the plan of harvest, the traders treat them

well, giving them liquor, cigarettes, and sometimes even money. This ensures not only that the plan will be made more quickly, but also that the buyers are allowed to exceed the approved quota. An envelope of money containing 400-500 CNY pays for 10 m^2 of over-logging, when the market is good. As corruption is a sensitive issue in China, building a special relationship (*Guanxi*) is a crucial first step to bribing an official. As a relatively small amount of money is involved, it is locally accepted as a "tribute" to the "patron", and the official will still take a close look at how much had been over-logged to ensure that the over-quota logging can kept under control to some extent. Post-harvest inspection is also easy to pass on application of this special treatment to gain permission for a timber harvesting plan and eventually receive the certificate of inspection.

In Pingzhang, once traders are granted a cutting permit, they hire somebody in the region to cut down the tree and do the debarking and debranching in the forest. As there is limited road access, the buyers also hire mules to transport the timber to the major road and a mini-truck to take the timber to the final processing plant in Baoshan City. The overall process involves the forest owners very little, as the traders aim to keep them ignorant about 1) timber harvesting and trade; 2) their estimations of volume and production; 3) the over-logging, ensuring a low price for the timber.

Xinqi's harvest management is more locally controlled, with forest officials performing like facilitators for the village's own forest management. Previous successful management practice has created mutual trust between villagers and village leaders and between village leaders and forest officials; the latter give them more opportunities to obtain the quota and balance the quota allocation within the township to favor the people in Xinqi. As the forest official stated, "We try to allocate more quota to Xinqi so that people can gain more from their forest, as we do not want to discourage their successful forest management practices". As a result, logging there rarely exceeds the quota.

In Pingzhang the timber harvest is only engaged by a few elites. By setting up

special relations *(Guanxi)* , the local elites are entitled to the quota and authorities, and their knowledge of harvest and estimation timber volume ensure their eventually great benefit from timber harvest. Instead of mutual trust, a tribute is paid in various forms ranging from liquor and cigarettes to money in order to maintain access to the quota and its benefits. In addition, the tribute brings significant benefits to the client including not only the quota but, more importantly, the ability to over-log and no tax to pay on timber cut beyond the quota.

5.4.2 Timber trade management

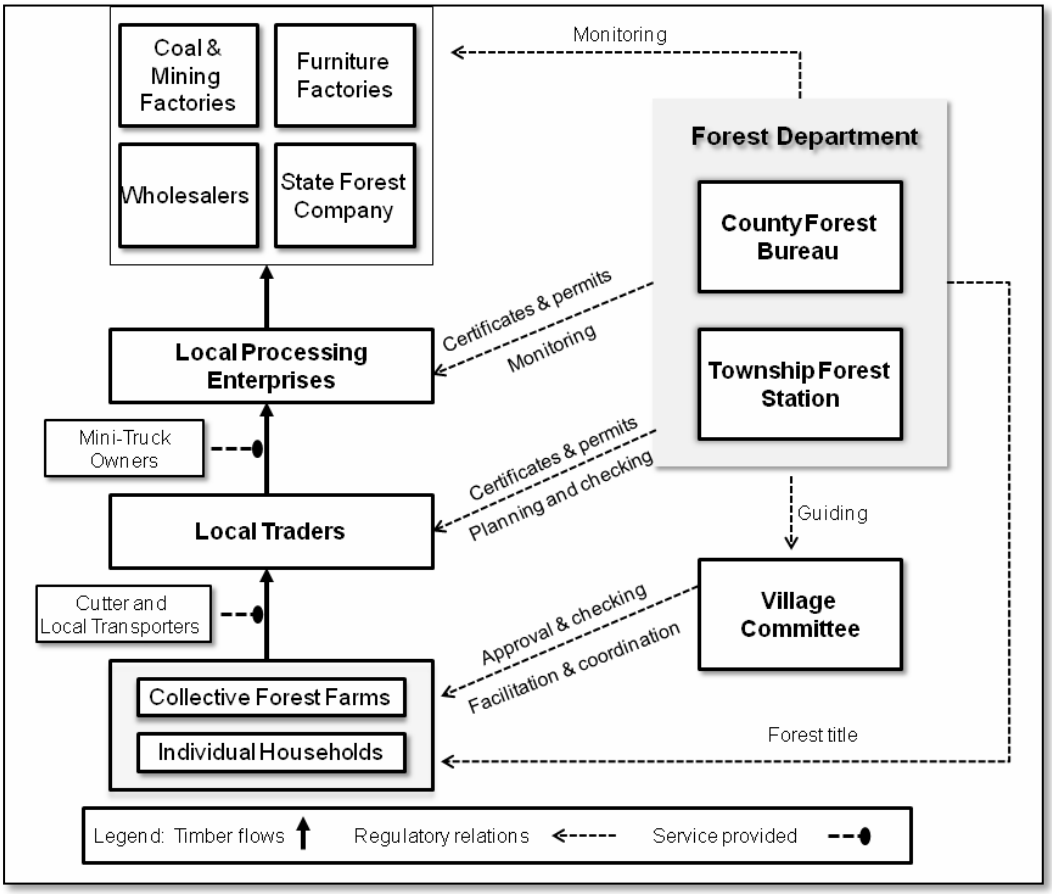
There is strict control of timber trading after the harvest, and several certificates required; a transportation certificate, certificate of post-harvest inspection, cutting permit and certificate allowing timber sales, as stated in the Forest Harvest Quota Management and Timber Transportation Regulation. Traders also need to present a tax receipt when the truck passes through checkpoints. Figure 5.2 shows the overall flow of timber and the relationships among the actors involved, focusing on Pingzhang, to outline my key interest in governance by the different actors involved.

As discussed above, a quota application requires a letter of approval and another stating the applicant's forest ownership, issued by the village committees. In Pingzhang, the village committee's facilitation, coordination and paperwork are done for traders who will apply for quota on behalf of forest owners. After they obtain the quota, the traders organize the timber-harvesting activity.

For management of trade, a transportation certification issued by the township forest station or county forest bureau and associated with the quota document is critical. The certificate clearly states from which village to which processor the timber is to be moved and the timber species and volume. After the logs are locally transported to the main road, it is usual for a mini-truck to be hired to carry them to the local processing enterprises. Along the road are several checkpoints

set up by the county forest bureau to ensure that the timber is being transported legally, and the volume, species and origin of the timber are matched to the relevant certificates. The trader and truck owner have to arrange the transportation within one day of felling as the certificate is only valid for a day, regardless of whether all the timber is transported. If it is not, the trader has to apply for another transportation certificate and go through all the paperwork again.

Figure 5.2 Relations among the actors in timber trade



Source: Fieldwork 2011.

At the local processing enterprise the timber is processed as wooden boards or poles and sold to four types of major factories before reaching the end consumer: 1) wholesalers, which sell timber to customers from other counties and prefectures; 2) state forest companies, which further process the timber to make wooden floors; 3) coal and mining factories, which use the timber to build the

mine frames; and 4) furniture factories, which use it to make furniture. The processing enterprises are monitored by the county forestry bureau, which issues them with certificates to authorize their processing and sales. That however cannot monitor if the timber is over-logged from quota control system.

In summary, the timber trade used to be a state monopoly with an early quota system to halt illegal logging and over-logging, but was liberalized in 1992 to allow private sector involvement in developing the market. The quota system strictly controls harvesting and transportation to avoid over-logging through a range of mechanisms including the harvest plan, cutting permit, post-harvest inspection, transportation certificate etc. However, this centralized system has caused a number of problems. The next section discusses benefit sharing in timber harvesting and trade.

5.5 Benefit sharing pattern

I concentrate here on local trade in Pingzhang to highlight the differentiated benefit sharing resulting from quota distribution, following the commodity chain analysis in section 5.4. I limit my analysis to logs (raw materials) and node of local processor in the timber chain, since the distribution of benefits after timber is processed would be difficult to analyze and is beyond the scope of this research.

Table 5.3 shows the local price structure for the two major tree species pine (*Pinus armandi*) and alde (*Alnus nepalesnsis*), which are common and widely used for furniture and construction. Traders pay tree owners for their timber. As mentioned, they buy the whole tree rather than paying by volume. Normally a mature tree ready for cutting will produce around 1-1.2 m^3 at a cost of 167 CNY per cubic meter for pine (about 200 CNY per tree) and 83 CNY for alder (about 100 CNY per tree). The local trader pays about 70 CNY per m^3 for pine and 40 CNY per m^3 for alder to the cutters, who take responsibility for cutting, debarking and de-branching and then use mules to transport the timber to the main road. At

the main road, the local trader hires a mini-truck capable of transporting 10-15 m^3 timber at 50 CNY per m^3. In addition to these costs they pay tax and a fee to the Forest Conservation Fund of 50 CNY per m^3 for pine and 40 CNY for alder. Notably, it costs local traders 30 CNY per m^3 to obtain the quota from forest officials in the first place as part of building and maintaining their *Guanxi*.

Table 5.2 Price structure for local timber in Pingzhang (2010)

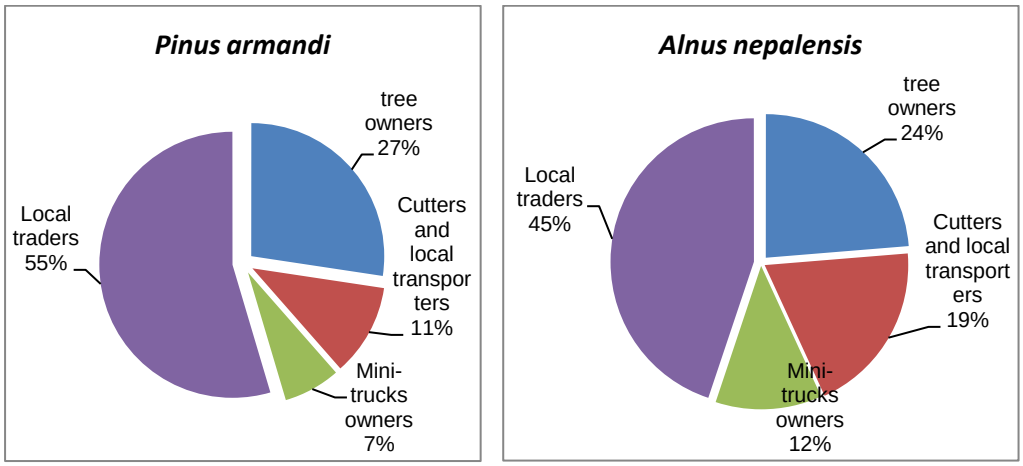
Price structure/tree species	*Pinus armandi* (CNY/m^3)	*Alnus nepalensis* (CNY/m^3)
Price		
Local trader price to tree owners	167	83
Local trader price received from local processor	700	400
Expenses		
Cost paid by local traders		
--Cutting and local transportation by mules	70	40
--Local transportation by mini-trucks	50	50
--Tax and fee	50	40
--"tribute and gift"	30	30
Cost paid by cutters and local transporters		
--cost of mule	2	2
Cost paid by mini-trucks owners		
--cost of truck operation	8	8
profits		
Tree owners	140	83
Cutters and local transporters	68	68
Mini-trucks owners	42	42
Local traders	333	157

Source: Fieldwork 2011.

Figure 5.3 presents the profit differentiation and distribution among the actors in the local timber trade. Local traders reap an extremely high proportion of the profit at range of 45%- 55%. By contrast, the tree owners only gain about 24% to 27% of the timber's value but have invested in planting, managing and conserving their trees for 30-40 years until they are ready for harvesting. With their access to the authorities, local traders are able to obtain quota and cutting permits that entitle them to extract a high percentage of the benefit, excluding ordinary farmers from trading locally. Their manipulation of the tree valuation

allows them to exploit the farmers. Moreover, they can organize about 200-300 m^3 of log to reach the demand from the local processor, that enable their access to higher level links of the timber market. Their knowledge of trade and tree valuation, access to the authorities and *Guanxi* with officials, and their capacity for organization enables them to invest the least and gain the most in the local timber trade.

Figure 5.3 Benefit shares received by the actors in *P. armandi* and *A. nepalensis* value chains in Pingzhang



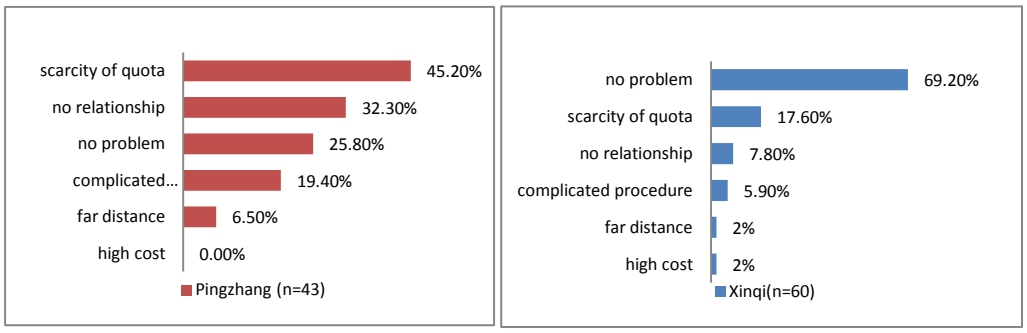
Source: Household survey, Fieldwork 2011

5.6 Villages' response to quota system

The imposition of strict harvest quota management shapes not only people's behavior in the timber trade and benefit but also their motivation and management practice in forest. People in Pingzhang reported that the restricted quota allocated to them affected their harvesting plans. The sampled interviewees in both villages listed the major problems in obtaining quota, although some found it less difficult than others. As Figure 5.4 shows, in Pingzhang the scarcity of quota is ranked as the first constraint to obtaining quota, and not knowing officials is next. "Complicated application procedure", "distance" and "cost" became the minor factor among the first two. A higher proportion of farmers in Xinqi than in Pingzhang reported "no problems", as the downwardly accountable village committee in Xinqi has higher

representativeness, which help for quota application on behalf of famers for timber for both domestic use and trade. Farmers in Pingzhang stressed the importance of *Guanxi* in obtaining the quota.

Figure 5.4 Problems related to obtaining quota



Source: Household survey, 2011

The strict implementation of quota control in harvest management causes local farmers to resist the system. The village survey revealed that 13.3% households in Pingzhang and 3.40% in Xinqi felled trees for house construction without a quota and cutting permit. The farmers interviewed simply insisted on their ownership and right to their trees and considered that there was no need for a quota, cutting permit or additional fee to use their own trees, which they had planted themselves. The difficulty of obtaining the quota through official legal channels and local understanding of corruption were further reasons for felling trees without a permit. This was less the case in Xinqi, where the village committee is more active in collaborating with township government officials to secure villagers' cutting permits.

Another significant impact of the strict quota system was farmers' disincentive for forest management particular plantation. Although the Forest Law clearly states that "Whoever plants the tree owns the tree", it is unclear whether the owner of a tree can harvest it. My household survey asked 43Pingzhang farmers to rank their two priority tree species for afforestation; they responded with walnut (98%) and chestnut (75%) against other timber species with higher economic value and local ecological suitability, such as *Pinus armandi (23%)* and *Alnus Nepalensis*

(53%). Farmers' preference for economic trees largely depends on their ability to benefit from tree plantation. Although the management of economic trees requires considerable and continuous investment in fertilizer, grafting, pruning and so forth, there is the benefit of harvesting the nuts and fruits as the trees mature. In contrast, even through the plantation of timber species requires much less investment and skill, the benefit from timber is still uncertain, as there is uncertainty for obtaining the harvest quota. However, walnut plantation is questioned in Pingzhang from the scientific point of view as high investment and technical knowledge are requires to ensure its productivity. In addition, current large-scale walnut plantation in Yunnan could affect walnut prices in the future.

In Xinqi, the household survey (n=60) showed that farmers preferred timber species with high market value for afforestation, including Fir (*Taiwania flousiana, Tsuga dumosa*) (95%) and Pine (*Pinus armandii*) (70%), are ranked as top two. In addition to lower investment and management costs for seedlings, fertilizers, planting and pruning, these species leave farmers with more free time to seek economic opportunities in off-farm jobs. As the village head stated, the quota is not a problem for them, but land availability is a constraint to forest development. The rapid increase in the market value and demand for timber has provided further incentive for farmers to plant timber species.

Why do some farmers choose not to prioritize timber trees when they are cheap and easy to establish and rapidly appreciate in value? It is clear that the quota has significantly shaped farmers' forest management behavior. As farmers from different villages have different concerns about the quota, their preferences regarding future forest development are also different. Although the quota is centralized and strictly implemented, a sound local institution with high accountability and representativeness helps to mitigate its negative impact.

5.7 Discussion

Based on multi-level governance perspectives of the timber harvesting quota, this research explores the formulation and distribution of the quota and its environmental and socioeconomic consequences in local communities. Drawing upon findings from the empirical case study, this section discusses theoretical and empirical implications of the quota system by examining local politics and power relations.

5.7.1 Actors and local politics in quota management

Discussion of local politics in managing the harvest quota focused on different scales and relations: 1) between local state and village leaders and 2) between village leaders and farmers. Village leaders in the two villages created different types of special relations (*Guanxi*) with the local state to obtain their timber harvest quota. In Pingzhang, village leaders built up special relations with township forest officials, and the special relations formed a basis of patron-client relations (Guthrie, 2009), while the patron (official) get special treatment (including liquor, cigarette, gifts and even money) to ensure the client (villager leaders) to gain scarce resource of quota. In rural Chinese politics, this patron-client relationship plays a crucial role in social and economic activities, as Oi also (1989) argues, with village leaders dependent on officials who control access to socioeconomic benefits key to the development of this relationship. This patron-client relation is interest-oriented and purely utilitarian with the aim of finding a business solution through personal/individual connections that inevitably lead to a corrupt “money + power deal”. As the quota is a particularly scarce resource, patron-client relations not only shape quota allocation but also make the influence to final unequal benefit distribution in local timber trade.

In Xinqi, *Guanxi* between village leaders and forest officials manifests as a type of “helper *Guanxi*”, as Fan (2002) defines it. While the officials allocate a reasonable amount of quota to the village leaders as required for their further distribution to the village, the village leaders in turn ensure the maintenance of

high forest cover and successfully complete large-scale afforestation tasks which help to reinforce the higher officials' command and political achievement. This *Guanxi* is also built on personal/individual connections at the beginning, but develops into strong institutional links between village committee and local government based on a long-term relationship and mutual trust. This *Guanxi* relationship is a process of exchanging favors and is utility-driven to "get things done" (Fan 2002), and both sides are more equal partners, ultimately leading to good benefit distribution in the timber trade.

Like the power of the quota system in local politics, allocating the quota is a redistribution of power over the forest and to benefit from forest. As the quota formulation and distribution is centralized and government-oriented, there is little space for village participation and transparency. However, after the county forest bureau allocates the quota to the township, there is scope to improve the local quota distribution, and downward accountability and high representativeness village committee is required. In Xinqi, the sound institution of the village committee has been built up from the historical context when the election of collective forest farm started earlier, and they control a lot of resources. This has balanced the power between village committee and collective forest farm and helped in the negotiation of power with township officials, strengthening social control over the resource, as highlighted in Midgal's (1994, 2001) state-in-society model; Pingzhang's upward accountability and low representativeness of the village committee may result in the extension of state power to locally-owned forest.

5.7.2 Power exercises in the harvest quota system

More broadly, drawing on Lukes' three dimensions of power (1978, 2005), the power relations existing at higher levels and exercised by state and state agency let to inaction at local level. Within the quota system, the farmers' power to make decisions about the utilization of trees is largely constrained by the structural quota application procedure, including requirements regarding tree diameter and

volume, a tree harvesting plan, the transportation certificate, volume allowable for housing, kitchen and livestock products, etc. However, a series of “institutional procedures systematically organize bias”, skew the process and benefit the interests of powerful groups (the state and its agency) over farmers (Lukes, 1978). It is also an exercise of power over farmers when the state and its agency affects farmers in a manner contrary to their interests. Unable to make their own decisions, this nondecision-making power as institutional set-up constrains is an exclusive process to deny farmers their rights over and benefit from forest. This particular institutional procedure as a process of state formation has further caused insecurity of forest tenure, preventing local people from benefiting from forest that they own.

Lukes (1978, 2005) notion of the three dimensions of power also existed, when questing what will be effective way for halting deforestation. It is a simplification of understanding from state for forest protection is to put the forest as a “no touch forest” for protection. And, it is expected that less deforestation can be automatically achieved via quantitative measures that ensure harvest rate lower than the growth rate. This is the basis on which the quota was set up and implemented and is similar to the national park approach of keeping people out of nonhuman zones to protect nature, (see Adams and Hutton 2007). This simplification has limited various possible actions that could better improve forest quality and quantities, including agroforestry, selective cutting, self-regeneration. On the other side, this simplification has however created an increasing area of density stands with immature and young forest, as mature forest has been over-logged. The SFA (2005) reports that immature and young forest account for 71% of total forest area in China. This extremely high proportion and density of immature and young forest poses an increasing risk for forest fire control and decreasing volume per ha. Thus, the quota system has affected forest degradation and the continuous deterioration of forest quality.

5.8 Conclusion

China has applied a simplified solution for halting rapid deforestation by implementing a quota system to control the quantity of timber harvested annually, but this has lead to complicated and massive social, economic and environmental problems. The quota system involves centralized control and its implementation diminishes household forest property rights and management incentives and creates the potential for corruption at the local level. It is thus not consistent with the objectives of decentralization. But, it is a process of state resistance of decentralization, who is exercised state power in contesting local control over forest. Local dynamics in managing and distributing the quota shape the benefit-sharing patterns and further impact on people's preferences in future forestry development. A reform of the harvest quota system is required that will allow more decentralized management and local participation in quota formulation and allocation. However, to be successful the reform requires improved rural governance and political structure in which village committees are well represented with, downward accountability and transparency in quota formulation and allocation.

Chapter 6

Regulating land use for environmental services

6.1 Introduction

China's transformation from an agricultural to an industrialized society has been marked by its rapid economic growth. This growth, however, has been at the expense of the massive overexploitation of natural resources with catastrophic environmental results (e.g. Shapiro 2000, Ho and Vermeer, 2006), and uneven development among the regions (e.g. Wang and Hu 1999, Fan 1997). The Chinese government has now launched a series of ecological restoration programs to improve degraded ecosystem functions and service and improve the livelihoods of environmental-service providers most of whom live in remote areas far from the benefits of China's rapid growth. Among these programs, the Sloping Land Conversion Program (SLCP) is the largest and highest-funded afforestation program using public payments to convert marginal cropland into forest with the engagement of millions of mountain-dwelling households as core agents of the project's implementation (Zhang et al. 2000, Xu Z. et al. 2004, Bennett, 2008, Wang et al. 2008). From when the program began in 1999 to 2008, the SLCP has spread across 25 provinces and the state has accumulatively invested 151.36 billion CNY (about 23.23 billion USD) in converting over 8 million ha of cropland into forestland, and 26,840,778 households have participated (SFA 2009).

As a preliminary experience of state-led payment for environmental service, SLCP is attracting international interest and research. Apart from studies of the program's policy formulation and institutional arrangements (see Bennett 2008, Xu Z. et al. 2004, Yi and Yi 2010, Yeh, 2009, Liu et al. 2008), the literature concentrates on the socioeconomic impacts of the program, particularly farmers' economic strategies and options after the program (Ma et al. 2009, Chen et al. 2009) and its implications for rural incomes and inequality (Li et al. 2011, Uchida 2007). While other studies explore

its local impact from a more comprehensive perspective (e.g. Weyerhaeuser et al. 2005, Xu J.T. et al. 2006, Bennett et al. 2011) whether the SLCP has been effectively implemented, the extent of its ecological and socioeconomic impact and how its performance can be improved are still unclear. In particular, in-depth assessment of how the multilevel governance of the policy implementation leads to the various observed ecological and socioeconomic outcomes is urgently needed.

This chapter examines the governance and implementation of SLCP in the two case-study villages to understand how the program has regulated land use locally and its environmental and socioeconomic implications. Based on the conceptual framework discussed in Chapter 3, the chapter particularly examines the accountability mechanism and polycentric system of decision-making in land use governance. It also explores power relations and their contestation from the perspectives of Lukes' (1974, 2005) three dimensions of power in relation to land management. The chapter has nine sections. Immediately following this introduction, I provide an overview of SLCP policy, discussing its origins, actors and program implementation at the national level. Then I present actual practice in the implementation of the program in the case study villages over time. In the fourth section, I describe participation in and understanding of the SLCP from the local perspective. Two key sections follow that empirically discuss the targeting of land and selection of tree species for the program. In the seventh section, I present the environmental and socioeconomic outcomes of the program in the case study villages. Afterwards I discuss the findings, and the final section concludes the chapter.

6.2 Sloping land conversion program: an overview

6.2.1 Origins of SLCP

Farming on steep slopes is typical in the west of China, since the topography constrains and population growth and less developed and industrialized. As reported by Liu et al. (2008), three-quarters of cropland in western China is on a slope of more than 25 degrees, and 60% of the population is below the poverty line. Also, western

China contains the head of the major watershed of national and international rivers including the Yellow River, the Yangtze, the Mekong, Pear River, Red River, the Salween and the Irrawaddy, which provide critical environmental services to those living downstream. Devastating floods that swept through the Yangtze Basin in 1998 attracted national attention to environmental degradation in these upper watersheds. Apart from deforestation, it is commonly believed that the cultivation of the mountainous land coupled with uneven rainfall caused major soil erosion and the ecosystem's function of regulating water and holding soil failed, ultimately leading to human-induced natural disasters (Xu Z. et al. 2004, Xu J.T. et al. 2006, Wang 2008, Liu et al. 2008). Poverty was identified as a factor associated with the extension of cultivation to steeper slopes, the clearance of forest for agricultural purposes and the subsequently overgrazed pastures that led to the unsustainable land conditions upstream (SFA 2002).

Immediately after the flooding, in 1999, the Chinese government initiated the SLCP for ecological restoration, with pilot studies in three provinces, Sichuan, Shangxi, and Gansu; this was expanded it to 17 provinces in 2000 and is now being implemented in 25 provinces. The initial goal of the SLCP is to increase forest cover and prevent soil erosion on sloping cropland by converting marginal agricultural land into forest. As it is implemented in remote and poor mountainous regions, the program also seeks to restructure the rural economy and improve the livelihoods of poor communities by providing subsidies and off-farm opportunities so that participating farmers can gradually shift into more environmentally and economically sustainable activities (SFA 2002).

Under the program, the State Forestry Administration planned to convert around 14.67 million hectares of fragile cropland to forest by 2010 (SFA 2002). The SLCP targeted marginal cropland on ≧15° slopes in northwestern China and ≧25° slopes elsewhere as the criteria for inclusion in the program. Apart from its integration of environmental goals with those of agricultural resource and poverty reduction, the program directly involves millions of rural households as core agents of the project's

implementation for a recognition of local priorities and to fulfill the need for greater local input into local discretionary forest management. It is also a landmark in promoting the volunteerism principle for decentralized, voluntary grassroots participation in project implementation in forested sectors of China (Bennett 2008, Weyerhaeuser et al. 2005).

The SLCP is also known as Grain for Green, as its innovative payment approach subsidizes farmers with grain in exchange for ecological restoration to cover their agricultural losses. Under the program, the government compensated farmers with 2250 and 1500 kg of grain per ha of converted cropland per year in the upper reaches of the Yangtze River Basin and the upper and middle reaches of the Yellow River Basin respectively, accounting for differences in regional average yields. In addition, annual cash subsidies of 300 CNY/ha/year for miscellaneous expenses and a one-off subsidy of 750 CNY/ha for seeds or seedlings are also provided. The duration of the grain and cash subsidies depends on the conversion: it continues for eight years if ecological forest is planted and for five or two years if economic forest or grasses are planted, respectively.[1]

In 2004, the grain subsidies were replaced with the equivalent value in cash, at CNY 1.4 per kg grain, in response to the rapid decline in stored domestic grain, the international food security crisis and the increasing operational cost of transporting grain. In 2007 the government launched a policy called “Improvement of SLCP”, or “Reinforcement/consolidation of SLCP”, as a recognition of long-term investment for forest restoration. This follow-up policy extends the compensation payment period to avoid land reconversion and ensure a positive environmental outcome from the SLCP. Under this follow-up policy, after the first round of compensation farmers receive CNY1875 per ha in the Yangtze River Basin and 1350 per ha in the Yellow River Basin for another 8 or 5 years respectively, depending on what tree species they have

[1] According to the State Forestry Administration’s definition, ecological tree species refer to trees used to establish forest stands (mostly timber species) for the purpose of maintaining and improving ecological functions and services such as biodiversity conservation, soil erosion control etc. Economic trees include tree species planted for non-wood products such as fruits, edible oils, nuts, fodder and industrial materials such as rubber for cash income.

planted (State Council article 25, 2007). The new payment is half the full compensation of the first round.

The SLCP policy is an innovative approach to regulating the land use for public goods of environmental service through a public payment scheme. It is a complex program involving multi-stakeholders at different levels and sectors to achieve the integrated goals of ecosystem conservation and poverty alleviation, and involves farmers' voluntary participation in contrast to previous command-and-control policies. The next part of this section describes the actors' involvement and the implementation of the program in general before I examine empirical cases.

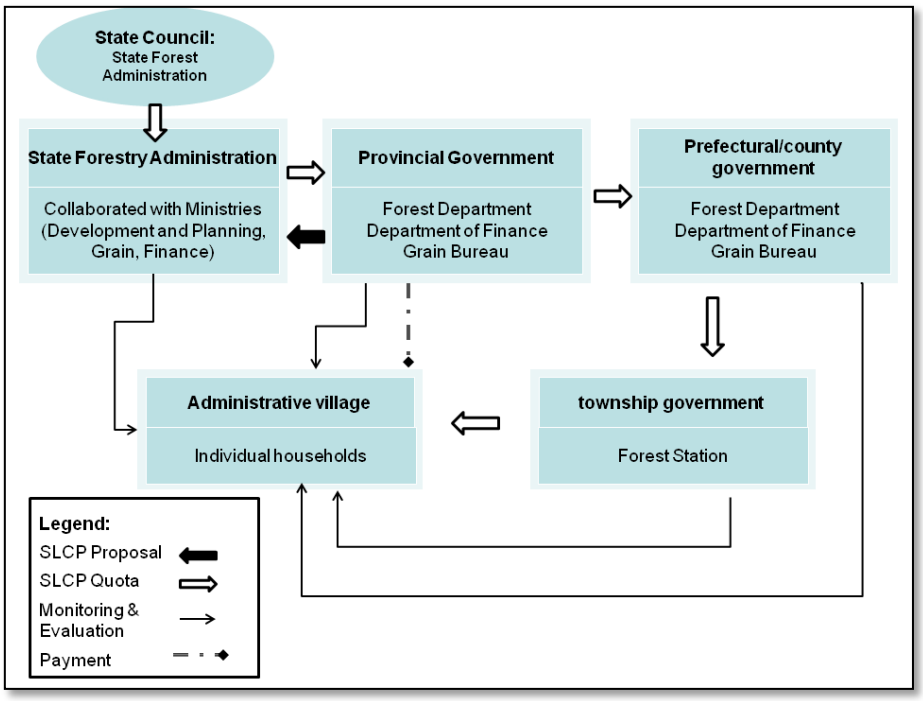
6.2.2 Actors and implementation

A wide range of actors is involved in the SLCP at different levels (see Figure 6.1). At the national level, under overall coordination by the State Council, the SFA takes the lead in collaboration with the Development and Planning Commission, National Grain Bureau[2] and Ministry of Finance to coordinate the overall program, including formulating the annual national plan, distributing the quota and finance, and monitoring and evaluation, as stated in Article 6 of the SLCP Regulations. The government at each administrative level is responsible for assigning the forest department to lead the program's implementation (Article 7). Thus, at the provincial level, the forest department takes responsibility for formulating the plan for the province and proposing it to SFA for approval. The plan is subject to revision and adjustment at the national level. Once the adjusted plan has been approved, the state transfers the approved budget directly to the province's finance department. Then the provincial forest department selects the potential region (at county level) for allocation of the SLCP quota. When prefectural and county government (the county forest department) have been allocated the SLCP task, they further select a township and village for the implementation of SLCP. The township government and county forest department are responsible for creating a specific implementation plan that includes

[2] Since 2004 the subsidy for grain has been replaced by cash, and the grain bureau is no longer involved.

the selection of the species and the area, while the administrative village committee is responsible for practically facilitating the implementation of the township plan at household level.

Figure 6.1 Actors and SLCP implementation



The SFA provides a list of species which can be included in ecological or economic forest. Local government should ensure a balance, with ecological tree plantation no less than 70% of the total program to guarantee the desired ecological outcome, as stated in SLCP Implementation Guidance in 2000. The provincial government shortens the list according to local ecological conditions and may propose additional species to be included in the list for the approval of the SFA. Then the county and township government select the specific species for plantation in the field. Seedlings are directly provided by the county forest department, although the central government earlier proposed to ask the farmers to buy the seeds and seedlings themselves. After the trees are planted, the township government monitors the survival rate and tree performance at the end of the year and reports to county government, which evaluates the implementation (particularly the tree survival rate and maintenance rates) annually on the basis of random selection across the SLCP

region to approve local accomplishment, and then reports to the provincial level. The provincial government then conducts its own annual evaluation and monitoring on a random selection basis, and having approved, makes the payments to households via its department of finance and grain bureau. The payment is made as a direct cash transfer to individual households' bank accounts. SFA also carries out annual evaluation and monitoring, the results of which directly affect the SLCP quota allocation and approval of provincial plans for the following year.

In Yunnan, the SLCP pilot study began in 2000/2001, with 9 demonstration counties and 20,100 ha land for retirement. It was scaled up to include the entire province in 2002, involving 126 counties across 16 prefectures. Until 2009, approximately 9.15 billion CNY had been invested, supporting 1.3 million households in their conversion of 355,400 ha farmland to forestland over the past 10 years and creating a 2.3% increase in forest cover in the province (Yunnan Provincial Forest Department 2010).

As stated in article 4-5 of the SLCP regulations, ecological matters are the first priority, emphasizing the importance of prioritizing fragile ecological regions for the program's implementation, with poverty alleviation secondary. In practice, land next to roads, mountainsides facing cities and major river basins are promoted as priority targets in the SLCP's Implementation Guidance for Yunnan Province (2000). An "implement the easiest part first" method was encouraged in order to accomplish the mission faster without affecting the national allocation to the province in the following year. All this provincial guidance allows lower government flexibility in implementation, on top of the national criteria for targeting the program area. That flexibility however directly affects the outcome of the program, as discussed in following section.

6.3 The SLCP in the case-study villages

This section examines the SLCP program in the two case-study villages for insights into the interpretation and implementation of the policy from central down to local government, and explores the differences in how the policy has been implemented in different places over time.

6.3.1 Xinqi: the SLCP as a collective action

The SLCP program started in Xinqi in 2002 and has been implemented there three times. Table 6.1 presents the program in Xinqi with duration of implementation, size of area and number of households involved. The farmers had different attitudes towards the program in different years, and the implementation of the program has changed over time.

Table 6.1 SLCP in Xinqi

Year	Area (ha)	No. households involved	Forest species
2002	65.59	239	All mixed forest with
2003	116.49	376	*Alnus nepalensis, Betula*
2005	42.93	230	*alnoides, Taiwania*
			flousiana, Tsuga dumosa

Source: Fieldwork 2011

In 2002, the first year that the program was scaled up across the entire province, it was introduced in Xinqi by the township government and county forest department; however, farmers were not willing to participate in it. They had various concerns. Mr. Yan, in Production Team 1 of village, for example, is a typical farmer who did not want to be part of SLCP. At the beginning of 2002, he was informed by the village head that 0.29 ha of his cropland was to be included in the SLCP. The village head asked him to prepare to retire the land after harvesting the buckwheat that he had been growing for 18 months. Although Mr. Yan had heard of the program, this was the first time the village leader had explained it to him in detail. He was told to plant mixed forest combining three species: alder (*Alnus spp.) and fir (Taiwania florusiana* and *Tsuga dumosa)*. He was not happy:

> *I am afraid the government will not give us the compensation as they have promised. I don't think the government is going to provide the compensation for eight years. If anything happens, they'll draw back and stop paying. This has happened before, when they asked for the afforestation of barren land … [also] the Alnus is not a very good species in terms of economic value in comparison with Taiwania florusiana. Mixed forest is not a very good idea … Although planting buckwheat does not make much money, we should do farming; we're farmers [and] I'm not sure if I will be able to harvest timber from [SLCP] forest.*

It was typical for farmers to lack confidence in the government and to be concerned about the selection of tree species. However, the SLCP was mandatory in the village. The township government and county forest department designated the cropland for retirement and species for plantation before consulting the individual farmers. In Xinqi, to encourage local farmers to participate the village committee formulated a plan for collective SLCP action which was approved by all villagers. Under the agreement, the village committee took on the responsibility and labor costs for tree plantation, replanting, pruning, fire and pest control and all the management tasks, while all the compensation was still paid to the farmers. When the forest is ready to harvest, farmers will take 70% of the profits and 30% will go to the village committee for use for the public good, particularly infrastructure development. This strategy was welcomed by both non-participating and participating households in the village. As most interviewed farmers stated, it allows participating households to just sit and wait for the money, while non-participating households also benefit from the program.

The township government and county forest department allocated areas for planting far from the village. As the village head said, the closest place was about 4 km away, and it is costly to cultivate agriculture crop there. All those give a great reason for village head to convince the farmers to participate the program. With the facilitation of the village head and village committee, the SLCP task had been accomplished with the involvement of 239 households and the retirement of 65.59 ha of cropland.

In 2003, as the program had been implemented smoothly in the previous year, the township government and county forest department doubled the quota for Xinqi. After a year’s implementation, the farmers had started to understand the program and had a degree of confidence in the government, as those participating had received their compensation on time. Farmers participating in the program had more free time for off-farm work, which gave them an incentive to participate in 2003. They also started to realize the benefits of mixed forest plantation. The previous dislike for *Alnus* spp. changed when they found that they have a greater survival rate and grow faster than firs. More importantly, the farmers realized that these fasting-growing broadleaved

species provide important shade for fir seedlings, helping to improve the growth and survival rates of the economically-valuable firs. As one interviewed villager stated:

> *Mixed forest is good.* Alnus *grows faster and protects our firs. In several years, we can cut the* Alnus *to let the fir grow. So we can sell the* Alnus *for cash; and we don't even need to do the cutting. The village committee will do it for us.*

The villagers started to be willing to participate, but requested the retirement of low fertility and remote croplands, which, however, were on slopes of less than 25°. The village committee reported their plan for retiring a large area of over 100 ha to the township government and county forest department for approval. Although the slope of the proposed cropland was less than 25°, they presented the officials with three key reasons for their approval, as recalled by the village head:

> *I basically used the policy to explain why that cropland qualified. First, the land is [geographically] concentrated, not fragments. That matches the "easier-to-implement" and "land concentration" principles. Second, the land is close to the road. We built lot of roads for transporting timber many years ago. Although this is not the major road, this fits the "roadside" principle. Third, farmers were actively requesting the retirement of this cropland. This is the national principle of "respecting farmers' wishes". Our plan was easily approved.*

After the township government and county forest department gave the village committee the right to select land, the SLCP was implemented more smoothly than in the year before. Active farmer participation and the large area of cropland for retirement raised the village's reputation at the township and county levels in comparison to other villages which had had difficulty persuading their farmers to convert their cropland.

Over the years, the benefits from the SLCP have become more obvious in terms of ecological functions, the security of the compensation and opportunities for off-farm jobs. Farmers started to approach the township government through the village committee asking for the quota. In 2005, they began competing to get involved in the SLCP. However, national adjustment of the quota significantly reduced the allocation to Yunnan and across China overall. In response, the village committee strategically

delineated several potential areas for SLCP and asked the township government to come and approve them. In this case, the township official checked that all the aspects met national and provincial criteria and finally allocated 42.93 ha to the village, but this area cover a great involvement of the villagers. Although non-participating households complained at being excluded from the opportunity to take part in the program, the village head used the collective agreement to explain how the SLCP could eventually benefit them all:

> *[W]e only have about 230 households included in the SLCP [in 2005], but we use the collective organization to support planting, management and harvest. The village committee will eventually get 30% of the benefit from harvesting these forests, and this will be used for the whole village, which means that everybody can directly or indirectly benefit from the program. The SLCP has become a collective affair and the program is benefiting all of us.*

As the village head stated, the agreement to share the benefit from the SLCP resolved the competition among the villagers. The "self-planning first" also showed the great activity and willingness to be involved to the program that made the township government happy to prioritize Xinqi's request. From planning, implementation and post-planting management to benefit sharing, the implementation of the SLCP reflects a typical character of collective action in which a local institution facilitates the policy implementation for public goods.

6.3.2 Pingzhang: multiple actors improving the SLCP

Pingzhang started its implementation of the SLCP between 2002 and 2003, and it has been implemented twice (see Table 6.2), although differently on each occasion.

Table 6.2 SLCP in Pingzhang

Year	Area (ha)	Households involved	Forest species
2002/2003	48.73	229	Pear *(Pyrus pyrifolia)*
2005	38.12	106	Walnut *(Juglans sigillata)*

Source: fieldwork 2011.

Pingzhang is located on a very steep slope in the gorge of the Yangliu watershed and is on the major road to the township. The village and the entire Yangliu Township have

been delineated as a poor area in Longyang county, Baoshan prefecture. These ecological and socioeconomic features provided a range of reasons for implementing the SLCP there. In 2002, the county forest department and township government allocated about 50 ha of SLCP to Pingzhang. The farmers did not understand the program, although it had been spreading across the nation for some time. Mr. Bei, from Beishuihe natural village, for example, was informed that his 0.4 ha of cropland, where he cultivated corn, would be included in the program. Mr Bei said:

> *I had heard of the SLCP on television, but I had no idea what it was about. Probably, it would attempt to ask us to plant more trees. I think it is a good program, because the government provides seedlings and grain for us for tree plantation. We can still do what we want.*

Later, Mr. Bei, like other villagers, started to realize the complexity of the program. First, the program had delineated land belonging to Mr. Bei that was close to his house and had good soil fertility. It had even been terraced in the 1950s. Second, the township government had already selected the tree species for them to plant – pear. Mr. Bei had no knowledge about planting, grafting and managing this species. Third, the program strictly prohibited intercropping with annual crops. In May 2003, Mr. Bei continued to grow corn, as only 300 pear trees had been planted per ha, leaving plenty of space for intercropping. Mr Bei considered that intercropping would benefit both the trees' growth and the annual crop's yield. When the township government saw the intercropping, a village task team was formed of village committee members who took responsibility for removing any crops on land under SLCP in the village. This created conflict, as Mr. Bei recalled:

> *The village task team came to my house to ask me to remove the intercropped corn. They explained that this was a state policy requirement. Otherwise, we, even the whole village, would not get any subsidies from the program. Although I complained that the intercropping is good for the tree and efficient use of the land, it was impossible to get them to understand. So I removed the corn, in which I had invested about 500 CNY for the seedlings and fertilizers myself. For other villagers who did not do it themselves, the task team went to their fields to take out all the corn.*

The implementation thus involved force, and few people welcomed the program at

that time, as stated by most of the interviewed farmers. People continued to complain about not being allowed to intercrop and the poor quality of the grain that the government provided. Many farmers complained that they had lost highly productive land with good soil fertility. The forest officials at the prefecture level recognized this problem throughout the prefecture. In 2003, at the invitation of the Baoshan Forestry Bureau, the World Agroforestry Centre (ICRAF) undertook measures to improve the implementation of SLCP in order to achieve conservation with development. A participatory approach was agreed upon jointly by farmers, foresters, and ICRAF facilitators and the team started to investigate the potential for intercropping with the medicinal plants that farmers traditionally collected. Using a participatory approach, farmers' knowledge was taken into consideration throughout the whole process of species selection, domestication and demonstration, and the intercropping served as a means of sustaining and raising incomes while the farmers wait for the pear trees to bear fruit. In addition to the benefits within the SLCP, this contributes to the sustainable use of wild medicinal plants through their domestication.

In 2003, 5 voluntary households and 0.8ha were initially involved in a round of on-farm demonstrations with more than ten different wild medicinal plants (He et al. 2009). As one species, *Dipsacus daliensis*, proved to be of high value and particularly suited to cultivation in the region, it was selected for subsequent plantation: in the second round, the project was scaled up to 40 households, and later the project covers four natural villages and more than 5.3 ha of land intercropped with medicinal plants and trees. Today, expanding the acreage to more than 20 ha led to the establishment of a medicinal plant producers' association. Local farmers have learned about medicinal plant domestication, cultivation, processing, and marketing. The economic benefits of growing *Dipsacus daliensis* have provided a significant incentive to farmers to expand their cultivation of medicinal plants into other SLCP areas. In 2005 the average production per ha was 1710 kg at 3169.5 CNY net income per ha. In the second round of on-farm demonstrations, the average production per ha increased to 2595 kg and the net income to 9955.5 CNY. In some instances, if they managed the medicinal

plant well, individual farmers' financial returns reached approximately 4,000 USD/ha (He et al. 2009) In a poor mountain community with an average income of 100 USD per capita, this motivated the farmers to engage in this practice and join farmers' associations.

While the economic benefits were significant, the ecological consequences of incorporating medicinal plants in SLCP forest restoration were also monitored in terms of improving tree growth and performance. The comparison shows that tree growth is much better with the intercropping system, and an average tree height of 3.8 m with 1.7 m crown width and fruit production of 3.73 kg can be reached compared to a height of 3.1 m, 1.26 m crown width and 2.3 kg of fruit without intercropping (He et al 2009). The intercropping system provides for the intensive management of land and trees with good fruit production and tree growth. This, in turn, leads to improved income generation. With a participatory approach, ICRAF worked with local farmers and forest official to develop a sustainable management strategy which is not only technically feasible for farmers but also acceptable to the government from the ecological and policy perspectives, and has made a considerable contribution to farmers' income generation (He et al. 2009). It was therefore welcomed by all stakeholders.

ICRAF's involvement has significantly helped the local farmers and officials to exchange knowledge, improved their mutual understanding and empowered local farmers in negotiations. In 2005, the county forest department allocated another round of SLCP for Yangliu Township, with walnut selected for the program. The village head and committee immediately went to the township asking for the quota allocation to Pingzhang. As the village head recalled:

> *We clearly told the township leader that we had suffered with the previous pear plantation. Pear is an exotic species and is not ecologically suitable for us. Also, as we are remote from the market, it adds a lot in transportation costs and loss of quality and value. We asked them to give us this opportunity to improve our local situation. Moreover, we also used your [ICRAF's] name to let the township leader understand that you [ICRAF] will give us support with the SLCP.*

The township leader accepted the leaders' approach and agreed to give them 20 ha for the SLCP. The village leaders went back and held a meeting for all villagers to introduce this possibility. Three natural villages, Lujiadi, Dazai and Xiapinghzhang village, started to be very active; their land met the SLCP criteria as it was close to the road, geographically concentrated and on a steep slope. The village leader asked the village to prepare the land and dig 50x50 cm holes as required, ready for final approval from the township. In October 2005, township officials visited to check and found that the Pingzhang villagers had prepared over 33 ha of land for the SLCP, exceeding what the county forest bureau had allocated. This highly active participation by the farmers led the township to ask the county forest department for an additional quota allocation. Finally, Pingzhang had approval for all the land prepared for SLCP, which totalled 38.12 ha. Multi-stakeholder involvement has improved SLCP implementation and management and created better benefit sharing for the local community. I return to these dynamics of power relations in the discussion section.

6.4 Targeted land for SLCP in study villages

Since targeting the area to be used for SLCP is a key aspect of assessing the program, it is important to understand the power structure behind the policy process. State policy set up the criteria for land selection, that it is on a slope of over 25°, and economic statues also need be considered. However, local practice changed this to ensure smooth implementation of the program. Empirically, there are several practical principles to follow including 1) "easier-to-implement"; for instance, selecting one side of the watershed instead of the critical catchment area; 2) selecting roadside areas, which suffer from heavy erosion and act as a showcase; 3) area that is geographically concentrated for easily implementation. Based on a topographical map analyzed using ArcGIS, Table 5.4 shows that less than 30% of the land under the program is on slopesof ≥25° in either Pingzhang or Xinqi. Most of the retired land is on slopes of between 15-25°, and the rest reaches 50.89% and 38.96% in Pingzhang and Xinqi respectively. In particular, over 32.69% of land conversion is on slopes of under 15° in

Xinqi and 19.64% in Pingzhang is under 15°(see Table 6.3).

Following spatial analysis of both villages, Figure 6.3 illustrates the slope distribution and targeted SLCP. It shows large areas over 25° in both villages that have not been targeted for the program. In Pingzhang, more of the targeted land is close to the main road connected to the township, making it a good showcase for SLCP and easier for monitoring by forest department. In Xinqi, the geographical concentration requirement has apparently been observed, as shown in Figure 6.3, making designing, implementation and monitoring easier for the forest department. Due to the quota limitations, neither villages has been able to incorporate all its heavy soil erosion areas into the program. However, the targeted land has rarely responded to the state's ecological consideration, and the rationale for land selection has been justified by province created practical guidelines to accomplish the program timely.

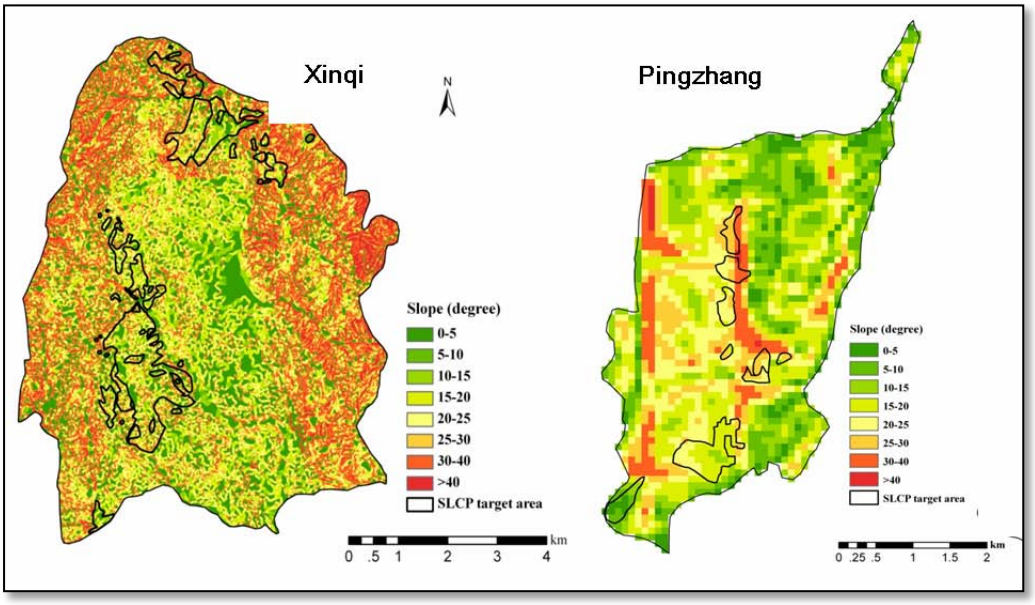
Table 6.3 Sloping land converted under the SLCP

Slope (°)	Pingzhang		Xinqi	
	Area(ha)	Percentage(%)	Area(ha)	Percentage(%)
≤15°	17.82	19.64	159.65	32.69
15-25°	46.17	50.89	190.25	38.96
≥25°	26.73	29.46	138.45	28.35
Total	90.72	100	488.35	100

Source: Based on analysis of a 1956 topographic map, fieldwork 2011

Based on the village survey, Table 6.4 shows the characteristics of the sampled households' plots under the program, indicating the problematic selection of land. To compare, in Pingzhang it is apparent that plots closer to home with a higher agricultural outcome were selected for the program, with the distance to home about 1398 m and about 4365 CNY/ha/year of agricultural output in average. Notably, the average production gain is slightly higher than the state's compensation, as 56.5% of plots are terraced, and the soil fertility on most plots ranges from medium (43.5%) to good (43.5% of all plots). Terraced land controls soil erosion better than many other types of forestland and young tree plantation. Moreover, terraces abandoned without annual maintenance would cause more soil erosion and loss of ecosystem function.

Figure 6.2 Slope distribution of land targeted for SLCP



Source: based on analysis of a 1956 topographic map, fieldwork 2011

Table 6.4 Plots characteristics of sampled households under SLCP

Plot characteristics		Pingzhang (n=46)	Xinqi (n=74)
Area (ha)	Mean	0.31	0.28
	S.E.	0.04	0.03
Distance to home (m)	Mean	1398	3912
	S.E.	165	159
Pre-program gains (CNY/ha/year)	Mean	4365	2625
	S.E.	412.5	135
Soil fertility (%)	Good	43.5	40.5
	Medium	43.5	55.4
	Poor	13	4.1
Slope (%)	≥25°	21.7	28.4
	15-25°	8.7	33.8
	≤15°	13.0	27.0
	Terraced land	56.5	10.8

Source: Fieldwork 2011

In Xinqi, on the other hand, the program has targeted more remote and marginal land with lower agricultural productivity, with an average distance to home of about 3912 m and agricultural output worth about 2625 CNY/ha/year. This lower agricultural output

gives farmers a strong incentive to participate in the program and supports their livelihood transition. Most of the targeted plots are on sloping land, with only 10.8% of the plots terraced. This data reflect a critical aspect discussed in the section above. Greater local involvement in policy implementation helps to fulfill the local need for targeted land in more remote, marginal areas of low productivity, and more closely meets the national goal and criteria for ecosystem conservation and the transformation of local livelihood structures and strategies.

6.5 Selecting tree species for SLCP in the study villages

The species selection reflects another key component of the SLCP, as the selection of ecological and economic trees is connected to different standards of subsidy and potential benefit after the compensation period ends. Furthermore, the proper selection of species directly affects the ecological outcomes of the program. As discussed above, national government has detailed a list of species for the countries that can be included in the SLCP. Local government can only select species from the list, and any amendment of the specified species list or plantation patterns require national approval. Practically, for preparing massive demands of seedling, it is the common for the county forest department to decide on the SLCP species to be grown by each township and village.

In Xinqi, ecological planting has been encouraged following the country forest department's promotion of ecological species across the whole of Tengchong County, where the county has a historical preference for and practice of growing species including *Alnus nepalensis, Betula alnoides, Taiwania flousiana and Tsuga dumosa.* As the county forest official responsible for SLCP in the county stated:

> *The selection of tree species and plantation patterns is absolutely decided by the county forest department. We promote ecological forest because: 1) ecological trees require less management skill from farmers and produce higher economic return; 2) ecological trees perform and grow better on converted land, where there is normally poor soil fertility; 3) ecological trees rarely require agricultural inputs such as chemical fertilizers to ensure economic returns; and 4) the economic benefit from ecological trees will have less influences from market change than that of fruit trees,*

as timber prices are always going up. So we promoted ecological tree species that meet the national need for better ecological benefits and livelihood considerations … we also promoted planting patterns of mixed stands of broadleaved and conifer forest to maximize ecological function and reduce additional inputs for pest and fire control … In particular, we promote the indigenous species which are more ecologically suitable locally.

The species selected for Xinqi were welcomed by farmers, although the planting of mixed stands was not understood at the beginning. A better performance of mixed stand plantations in the following year gained the farmers' acceptance. The farmers particularly liked the use of indigenous species, about which they have long traditions and knowledge. A mixed stand plantation can created in different combinations that include not only different species but also different quantities and proportions of each species in the combination, providing the potential for farmers to negotiate for a diverse combination in their plantation. As the village head said: "We prefer to have a larger proportion of *Taiwania flousiana* with fewer *Alnus nepalensis,* as the former has higher economic value"*.* Therefore*,* as Xinqi's SLCP documents show, *T. Flousiana* accounts for 60% to 70% of forest and *Alnus spp. for* only 10%.

In Pingzhang, one of the poorest villages in the Yangliu township, the township government have strongly promoted the economic development that economic tree species has been encouraged. In 2002, in light of the township's development strategy, the township leader selected pear trees for the SLCP program and asked the county forest department to support them by providing seedlings. The pear is an exotic species, however, and brought a range of both socioeconomic and ecological problems, as the successor of the township leader said:

Our ex-leader made a mistake in selecting this pear for the SLCP. Although his initial idea of promoting economic development was good, he is not a trained forester. Several problems occurred after the pear trees were planted: 1) farmers have little knowledge of the planting, management, and pruning of this pear, so the planted trees are not very healthy; 2) the pear species is not well selected; it does not taste very good and has little economic value on the market; 3) Yangliu is remote area with poor road access and the mature pears will lose value in transit and cannot stored, so must be transported and sold quickly.

The farmers did not like the pear either; many joked that it was not even good to feed to pigs because of its bad taste. As a result, few people cared for their trees. The majority of farmers interviewed expressed their intention to cut down the pear trees when the compensation payments ended. In 2004, a survey conducted by the village head and township forest station showed a survival rate of only about 50% of the trees, which is much lower than the national standard for continuously providing subsidy. The county forest bureau and township government had to provide another round of free seedlings to replace dead pear trees to ensure that the tree stands met the national requirement. “Luckily, this time it’s walnut”, the village head stated. In contrast to fruit, walnuts are easy to transport and store and there is a good market for them now and in the foreseeable future. Although farmers do not have much knowledge about the management of this soft-shell walnut, traditional management of hard-shell walnuts in the village provided basic knowledge. The above characteristics of walnut provided a strong incentive for farmers to plant the trees. In 2005, the village head approached the township for its SLCP quota as he already knew that walnut would be specified for the program.

Although walnut was planted as an economic tree for its nut harvest, farmers were paid compensation for a longer period commensurate with the standard for ecological trees. The walnut is classified nationally as a double-purpose tree species, with the plantation pattern determining its purpose in use. A plantation density of more than 2250 individual trees per ha is regarded as ecological use and eligible for 8 years’ subsidy, while trees planted less densely are considered economic trees and attract a subsidy for only 5 years. To motivate the farmers, local government designed walnut plantations for nut production with only about 525 individual superior seedlings planted per ha. To meet the national standard of over 2250 individual trees per ha to be eligible for 8 years’ subsidy, the county forest department also provide free hard-shell walnut for a direct sowing in field along with those superior seedlings. Also, local government implied to the farmers that they would be able to cut down the hard-shell walnut trees after the program ended to gain the economic benefit. This

practice has been widely applied in Baoshan prefecture to provide more incentive for local participation, and is expected to have better economic returns.

Species selection is mainly dominated by the township government and county forest bureau. Their knowledge, experience and expertise further determine both local incentives and the possibility of the program's success. Clearly, recognition of local knowledge about indigenous species would help to meet local needs in Xinqi and Pingzhang, not only for the better accomplishment of the program but also building downward accountability.

6.6 Local participation and villagers' perceptions of decision making in SLCP

The above section has examined the process of SLCP implementation and policy interpretation in different villages at different times. Table 6.5 has quantified local participation in Pingzhang and Xinqi with data from the village survey. It is clear that villagers had very little autonomy and participation in decision-making in the SLCP in both villages, even though the farmers are keen to be enrolled on the program. More than 70% of interviewees in both villages ticked "no autonomy" regarding decisions about on the location and area of land to be retired, and 60% ticked "no autonomy" regarding the selection of tree species to be planted. These three types of decision-making power are held by the higher government administrators, leaving little space for local participation.

Moreover, only about 45% of the households of in both villages had been consulted about their willingness to participate in the program, although the policy highlights the importance of local volunteerism. In practice, this consultation is commonly carried out through a village meeting. The survey found almost the same percentage of household participation at the planning meeting in Pingzhang (47%) and in Xinqi (45.8%). The so-called planning meeting actually served as an information distribution meeting where the village head announced the planned strategy and asked for the villagers' informed consent. He informed the villagers the information about where and how much area for SLCP and with what species. Following this, the villagers have

higher participation for land measurement (64.7% in Pingzhang, 87.5% in Xinqi), which would determine the actual area designated for SLCP and how much compensation they would be paid.

Table 6.5 Farmers volunteering for SLCP

Measure of volunteerism	Pingzhang (%)		Xinqi (%)	
	YES	NO	YES	NO
Question to SLCP Participants	**N=34**		**N=48**	
Did you like participating in the SLCP?	88.2	11.8	97.9	2.1
Could you withdraw if you did not want to participate?	38.2	61.8	89.6	10.4
Did you have autonomy to select tree species for planting?	38.2	61.8	39.6	60.4
Did you have autonomy to decide where to retire?	26.5	73.5	22.9	77.1
Did you have autonomy to decide how much area to retire?	23.5	76.5	16.7	83.3
Did you participate in the land measurement?	64.7	35.3	87.5	12.5
Did officials consult you about your willingness to participation in the SLCP?	44.1	55.9	45.8	54.2
Did you participate in any planning meetings before the program was implemented?	47	52.9	45.8	54.2
Question to Non-participants	**N=9**		**N=12**	
If you had wanted to participate, could you have done so?	11.1	88.9	0	12

Source: Fieldwork 2011

Apart from these similarities in the two villages, it is also obvious for the non-participants who would be hardly to be involved into SLCP if their land is not located in the targeted area. Participated or non-participated, how much to participated is highly depends on the geographical location of the land and the delineation of those land was however done by higher level administrative body. The volunteerism for involved in the program remains as informed consent. And, the process of gained the informed consent is more compulsory.

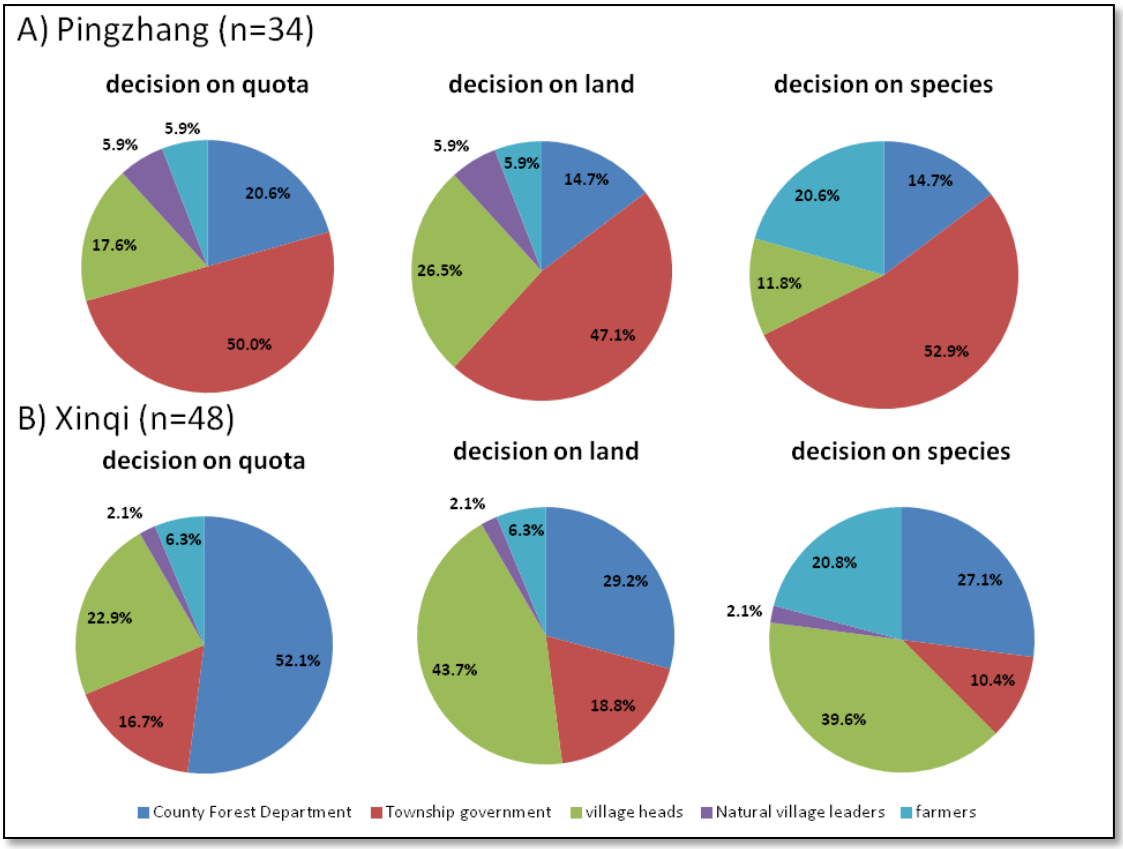
There was another difference between the two villages in the matter of withdrawal from the program; 61.8% of participating households in Pingzhang said that they could not withdraw if they did not want to participate compared to only 10.4% in Xinqi. This is because Xinqi village has a local practice of land exchange, where anyone who does not want to be part of the SLCP exchanges their land with that of someone who does, and the village is also able to use collectively-owned land for exchange in order to make the program implementation run smoothly. As the village head recalled:

> *We exchanged a lots of land for SLCP in 2002, as the farmers did not actively participate in the program. In particular, we used a number of collective cornfields for exchange with individual households. We had to do this, otherwise we could not accomplish the township's SLCP mission. However, people had more incentive to be involved in the program the year after, as the farmers had received the full amount of compensation from the state. Now many villagers who exchanged their land are beginning to regret what they did, and a number of them have started self-conversion, as timber prices and wages for off-farm work are continuously increasing.*

Quota allocation, land selection and species selection are three key elements in SLCP decision-making. Figure 6.3 outlines farmers' perceptions of SLCP decision-making. In Pingzhang, around 50% of the sampled households saw the township government as the dominating actor in decisions about quota, land selection and species selection, and the county forest department was ranked second that 14.7% of households perceive their key role in land and species decision and 20.6% household think their key role in quota decision). This reflects the county forest department's collaboration with the township government in the design of the program. The village heads were ranked after the county forest department, as they are the key actors consulted to determine whether the program can be implemented in the villages. Interestingly, they were ranked to have greater role in decision of land selection against decision of quota and species. In practice, the final decision about the area to be used for the program was made through negotiations between the village head and township government and between the village head and farmers. The village heads are therefore key facilitators who have the final influence on land selection. The farmers reported that they themselves had had a say in the species

selection (20.6% of farmers respond their decision on species). This is because the 2005 walnut plantation was suggested by the township and finally decided by the farmers themselves in Pingzhang.

Figure 6.3 Farmers' perceptions of influential actors in SLCP decision-making



Source: village survey in fieldwork 2011

In Xinqi, (see Figure 6.3) different actors play different roles in different sectors. Over 50% of interviewees perceived the county forest department to be the key actor in decisions about quota allocation. The county forest department also made the plan for the county overall and directly approached the higher-level forest department to request quotas. Then the village head collaborated with the township government for the quota allocation for the whole village was perceived as playing the second role. As for the decision on land selection, 43.7% of respondents saw the village heads as key influential actors who actually selected the land. As mentioned above, the village head assisted in the land exchange and negotiated with the township government to include remote and marginal land. This made them influential in the land selection.

Again, the village heads had a say in the species selection, with 39.6% of the sampled households ranking them the top actors in this. Xinqi had a more decentralized model for village decision-making.

Although SLCP policy calls for volunteers, in general the program has been implemented with a top-down approach for timely completion. In the policy process, the township government and county forest department played a dominant role in decision-making regarding the quota allocation, targeting the area to be converted and selecting the species. However, a well-organized local institution with a strong historical reputation such as Xinqi can facilitate the process of implementation to help local voices be heard and meet local needs. The local institutional arrangement in response to the policy implementation thus helped to increase farmers' benefits from the policy.

6.7 Post-program assessment

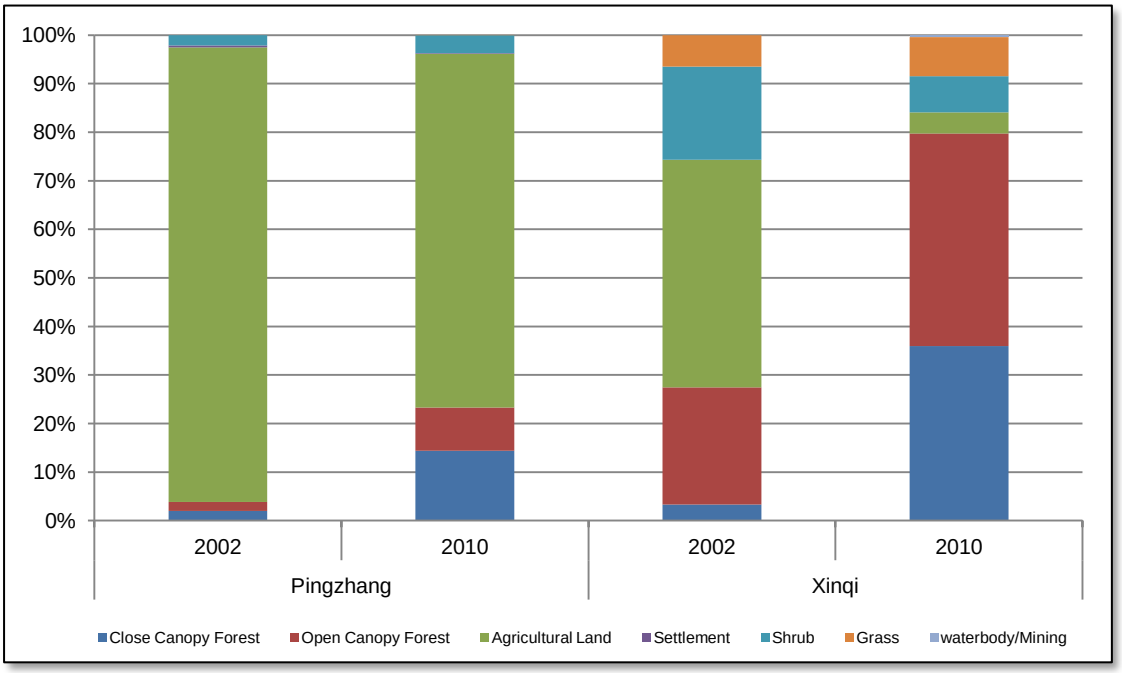
This section provides an assessment of the SLCP's ecological and socioeconomic impacts. It compares the outcomes of the policy process and implementation in the two villages. First, the spatial data were used for an analysis of forest quantity and quality after the program's implementation, in particular focusing on forest cover and land use change on the land targeted by the program. Second, the village survey data were analyzed to provide insight into the local socioeconomic outcomes and people's impressions of the program in each village.

6.7.1 Forest quantity and quality after the program

Land cover change in the plots of SLCP reflects the effectiveness of the program from the ecological perspective. Using remote sensing data and analysis, Figure 6.4 shows local land cover before and after the SLCP in a time series from 2002 and 2010. Paying particular attention to forest cover, it illustrates a significant difference in forest quantity and quality on these plots. In Pingzhang, forest cover on SLCP plots has increased, although agricultural land is still the dominant land cover. From 2002 to 2010, forest cover increased from 4% to 23% at the expense of a decrease in

agricultural land area from 94% to 73%. Closed and open canopy forest cover reached 14% and 9% respectively in 2010. However, the SLCP has not made as big a contribution to forest cover increase as expected. This is particularly due to the tree species planted; the early pear plantation had a low survival rate and made little contribution to forest cover; and the young walnuts were planted in a sparse pattern as an economic crop also contributing little to increased forest cover, although it was designed and compensated as for ecological afforestation.

Figure 6.4 Land cover change on SLCP plots



In Xinqi, as shown in Figure 6.4, there has been a clear shift from agriculture-dominated to forest land cover. From 2002 to 2010 there was an increase in forest cover from 27% to 80% of the total area, while agricultural land cover decreased from 47% to 4%. In particular, there was a significant increase in closed canopy forest, from 3% to 36%, while open canopy forest cover increased from 24% to 44%. Clearly, the SLCP in Xinqi has led to a good environmental outcome and made a strong contribution to forest cover increase as expected. The selection of tree species has played a big role in contributing to the forest's rapid recovery as a result of the dense plantation pattern for ecological tree species.

Although decision-making in policy implementation is concentrated at higher levels of government, the local village's facilitation, reputation and higher levels' recognition of local knowledge have helped to improve the program's implementation from land targeting to species selection. With high local participation and support, the SLCP in Xinqi has achieved a better ecological outcome, in terms of forest quantity and quality, than in Pingzhang.

Table 6.6 Socioeconomic assessment of sampled households after SLCP

Questions to farmers		Pingzhang (%) (n=34)	Xinqi (%) (n=48)
Direct benefit from tree	Yes	0	2.1
	No	100	97.9
Indirect benefit (NTFP, intercropping)	Yes	52.9	6.3
	No	47.1	93.8
Do you have a forest title to the converted land?	Yes	76.5	97.9
	No	23.5	2.1
Subsidy amount	Too low	8.8	6.2
	Low	41.2	25.0
	Reasonable	50	68.8
	High	0	0
	Too high	0	0
Duration of subsidy	Too short	10.1	2.1
	Short	33.3	54.2
	Reasonable	57.6	39.6
	Long	0	4.1
	Too long	0	0
Satisfaction with land selected	Satisfied	85.3	97.9
	Unsatisfied	14.7	2.1
Satisfaction with tree species selected	Satisfied	70.6	97.9
	Unsatisfied	29.4	2.1
Success of the program	Successful	76.5	97.9
	Unsuccessful	23.5	2.1

Source: village survey in fieldwork, 2010

6.7.2 Socioeconomic assessment

As a poverty alleviation program, the socioeconomic consequences of the SLCP are interesting. Table 6.6 shows the result of a socioeconomic assessment based on the

village surveys. It is clear that neither village has directly benefited from the trees planted yet, although the pear trees have matured and are fruiting in Pingzhang. Interestingly, over 52.2% of sampled households in Pingzhang and only a few (6.3%) in Xinqi reported significant indirect benefits from NTFP or intercropping with the program. Moreover, more farmers in Pingzhang (57.6%) think the duration of the subsidy reasonable than in Xinqi (39.6%). Clearly, ICRAF's support provided a helpful buffer for Pingzhang farmers as they waited for their trees to fruit and ripen for harvesting. More farmers in Xinqi think the amount of compensation is reasonable than in Pinghzhang, at 68.9% and 50% respectively. This is because a number of plots converted in Pingzhang had been producing higher agricultural output than the compensation standard, whereas the plots in Xinqi were much less productive.

In Xinqi 93.8%, 97.9% and 97.9% of farmers received a forest title or were satisfied with the selection of land and tree species respectively, compared to 76.5%, 85.3% and 70.6% in Pingzhang. Thus in general, more Xinqi villagers are satisfied and consider the program a success than in Pingzhang. While Pingzhang has benefited from the SLCP more recently than Xinqi, the benefit is indirect. In the long term, Xinqi has more promising and further high benefit from the program.

6.8 Discussion

Drawing upon the findings of this research, this section presents a theoretical discussion in light of the debate on the decentralization of forest governance in China. It focuses on two key areas: local politics and accountability, and knowledge and power.

6.8.1 Local politics, accountability and polycentricity

Clearly, as decentralization, central government has empowered local states to exercise considerable power in forest programs. There are a great resource and power allocated to locality from central to local, but local governments mobilized these resources in their own interests, while they aimed to have their political achievement. In this study of the SLCP, apparent differences between written state policy and actual

implementation have come to light. At the provincial level, the government set its own criteria for targeting sloping land and justification of heavy soil erosion land in light of state standard. As a result, the roadside and easy-to-implement principles have been applied widely and a number of targeted lands did not meet the national standard, affecting the positive environmental outcome the state expected. At the township and county levels, in Pingzhang, for instance, government provided an incentive to farmers by revising the state's requirement for tree species and planting patterns that compensated economic tree plantation for the longer duration set for ecological species. Although this practice did not meet the national requirement for ecological restoration, it was welcomed by farmers.

From the view of the state-society model (Migdal 1994, 2001), local government in China is engaged in a continuous struggle for power from central government. In practice, local entities receive power from the centre but do not always act as passive rule followers and instead also create rules themselves, as argued by Oi (1995) and Andersson et al. (2004). Central-local relations are increasingly marked by bilateral bargaining and compromise rather than unilateral command and coercion (Baum and Shevchenko, 1999). The local state continues the practice of planning and monitoring, but new institutional incentives increasingly encourage local officials to carry out their regulatory functions to maximize local rather than national interests. Thus it is hard to find local state performance as purely upwardly or downwardly accountable. Local officials have to be upwardly accountable to higher-level government in order to gain resources and investment; however, they also need to provide a certain level of downward accountability as they are closer to their locality and know the needs of local people. This accountability dilemma, together with a significant transfer of power from central government enables local governments to set their own agendas and respond to both higher-level government and their local communities.

From a polycentric perspective, the implementation of the SLCP involves a multiple-level decision-making process. As discussed above, provincial, county and township government made significant decisions that shaped the policy process and

outcome. However, insufficient power was transferred to the community level, although the state's policy aims to promote local participation and autonomy. As a result, in Pingzhang elected community leaders were upwardly accountable to higher-level government, particularly in the first round of the SLCP. Following the failure of this first round, village leaders' responsiveness to villagers increased in the second round of the program. In Xinqi, the local community created its own innovative institution to create more equitable benefit distribution and sharing. With its strong capacity, the local institution can perform in the local interest.

The results have revealed the increasing role of the third sector in improving forest governance at grassroots level in Pingzhang. International NGOs collaborated with the local community to gain power from government and allow more space for self-governance in their forest management, contributing ecological and economic benefits to the local people. Their initiative made the policy acceptable and simultaneously met local needs. There was also a struggle against the state's prohibition of intercropping. This polycentric system allowed multiple governing authorities at differing scales to exercise a certain amount of independence to make rules or produce locally-situated knowledge within a specific domain, and tended to facilitate the achievement of more effective, equitable and sustainable forest management arrangements in response to the top-down forest program.

The empirical findings from the post-program assessment have critically support that a polycentric governance system and downward accountability have led to a good better environmental and social outcome. There is clear evidence that the increased percentage of forest cover and people's satisfaction and feeling of success in Xinqi is significantly greater than that in Pingzhang. The involvement of an international organization provided critical economic and environmental benefits that complemented the SLCP.

6.8.2 Knowledge and power

This research found Lukes' (2005) three dimensions of power particularly useful in the analysis of the policy process from formulation to implementation. Although international research has found little in terms of a relationship between widespread flood and deforestation (FAO and CIFOR 2005), it was taken for granted that the local flood disaster was directly linked to soil erosion in the upper watershed where upland agriculture, especially cultivation on sloping land, is seen as the main cause of deforestation and environmental degradation. This dominant and simplified understanding of the link between upland agriculture and deforestation is widespread and accepted by governments across the world, particularly in Asian countries, (see critiques by Dove 1993, Lambin et al. 2001, Blaikie and Muldavin 2004, Sturgeon 2005, Fox et al. 2009). The state's knowledge of upland agriculture and deforestation created a "dominated acquiescence" (Lukes 2005, Dowding, 2006) to seeking complete alternatives to agricultural land use in upper watersheds and defined how afforestation would lead to less erosion and better environmental services. This is the basis on which the SLCP was formulated; but this produced knowledge did not allow other types of knowledge generation that would have helped in understanding the complexity of the links between agricultural and ecosystem functions (Sturgeon 2007, 2009).

In addition, based on this dominated acquiescence, successful afforestation can only be achieved without any agricultural practices that may damage young plantations, and thus the intercropping of annual crops was prohibited. Again, this is due to the domination of forestry sector knowledge; their simplification of forest rehabilitation and ecosystem restoration largely ignored local knowledge and practice, which however offer a holistic understanding of ecosystem functions (Sturgeon 2007). Empirically, the intercropping system provided not only necessary shade for the seedlings and young trees planted but also nutritional support and exchange between crops and trees. More importantly, the intercropping system controlled soil erosion by increasing vegetation cover when the young trees were small. However, the dominated

knowledge of forest restoration limited the possibility of integrating local knowledge and practice, creating numerous conflicts based on a contestation of knowledge between local and scientific knowledge.

As this knowledge contestation, international organizations can play a critical role in calling attention to and recognizing local knowledge. As experienced in Pingzhang, ICRAF employed a participatory approach to maximize the use of local knowledge of intercropping. Although ICRAF may not have influence regarding area in policy, geographical location and species selection, it helped to develop an intercropping strategy that was acceptable to state government and welcomed by local farmers and which eventually led to positive social and environmental outcomes. Thus the role of international organizations in a polycentric system is not limited to acting as bridge and facilitator between government and farmers to promote local participation in decision-making; more importantly, they can help with knowledge generation and recognition.

The state's definitions of 'ecological forest' and 'economic forest' imply the single functionality of tree species. Thus, the state lists out a limited selection of species. Although central government was not directly involved in deciding on the species selected, its knowledge construction of ecological and economic forest eliminated the possibility of local decision-making and selection of multifunctional and multipurpose tree species and, further, eliminated the possibility of developing a mosaic landscape ecosystem. This dominated acquiescence only acknowledges the clear-cut distinction between economic and ecological benefit, affecting local potential for using the SLCP to restructure local livelihood structures and strategies. In Pingzhang, the ex-leader of the township believed that economic benefit from forest could be only achieved by planting economic trees, ignoring extensive local knowledge and the local context. This belief did not consider a trade-off between ecological and economic value, local knowledge and scientific knowledge, local practice and the broader market, restricting the potential for positive environmental and social outcomes from the SLCP.

In sum, power in decentralization is not only limited to decision-making and structural

non-decision-making matter to constraint possible decision-making, but is also situated in knowledge-based practice and the struggle for and contestation of power. The multi-dimensional powers contextualized in structural, social and political relations are the fundamental factors that have limited the positive ecological and economic outcomes of forest decentralization. Effective decentralization requires not only a sufficient transfer of power, eliminating constraints to meaningful decision-making, but, more importantly, it also requires recognition of local practice and knowledge from a holistic perspective.

6.9 Conclusion

To regulate land use for improving environmental services, the Chinese state has made a huge investment in improving its ecosystem functions through the SLCP program. Apart from providing financial incentives and free materials, the state also attempted to promote local autonomy and participation in the program. This promotion is a landmark in shifting forest decentralization from a focus on the rights-based approach to forest tenure reform to a more power-oriented approach, with local governance involved in decision-making. However, the effectiveness of forest decentralization requires extensive understanding of the local context and recognition of local knowledge far beyond a political slogan or mandatory policy promoting local volunteerism and autonomy. The meaningful transfer of power in decentralization reform requires not only allocating decision-making power to local administrative bodies on paper, but also setting up an enabling mechanism to ensure that decisions can be made at the local level to follow local requirements. This necessitates the fundamental reform of governance structure and improved social-political relations and structures.

Chapter 7

Forest tenure and local dynamics of forest property rights

7.1 Introduction

The ownership of forestland in China is officially classified into two types: collective-owned forest (*jitilin*, owned at the level of the township and administrative and natural villages) and state-owned forest (*guoyoulin*, owned by central and local government). The collective forest accounts for 58 percent of China's forest area (FAO 2009) and is concentrated in the twelve provinces of Southern China, where it makes up 70 to 90 percent of the province's forested area (Liu 2001, Miao and West 2004). The collective forests make a significant contribution not only to environmental services but also to the rural livelihoods of about 500 million farmers. The government has given tenure arrangements and the management of collective forest considerable great attention and has made several reform efforts to improve its effective management.

Following the success of decollectivization in agricultural land reform, since the 1980s the Chinese government has initiated two forest tenure reforms to strengthen individual households' use rights to collective forest. The first reform, in 1981, started to transfer collective-owned forestland to individual households. However, the result was mixed and less positive in terms of both environmental and local livelihood outcomes (Liu 2001, Miao and White 2004). The subsequent poor policy implementation and forest management led to the recent second forest tenure reform, which started with a pilot test in 2005 and was rolled out nationwide in 2007. To devolve land-use rights and forest ownership of collective forest areas to individual households, the second reform again aimed to provide incentives to households to use collective forestland and forest to generate income and improve their livelihoods

and forest management. Regional variability and local governance processes also shape the outcome of this reform. A new evidence of forestland allocation is needed to provide empirical and theoretical understanding of dynamics of forest governance in rural China.

Based on the conceptual framework presented in Chapter 3, this chapter explores the governance structure and process of policy implementation related to forest tenure arrangements with a particular focus on the second forest tenure reform. Through a comparison of the two case-study villages, it reveals the correlation between the policy process and the outcome in the context of the local dynamics. In particular, it examines the role of the local state and the multiple centers of decision involved in the decentralization, and the existing accountability mechanisms and power relations within the forest governance structure, using three-dimensional power analysis. The chapter contains seven sections; immediately following this introduction, I present the evolution of collective forest tenure to provide a historical context for tenure reform policy. The third section describes the local dynamics of forest tenure arrangements prior to the second forest tenure reform. In the forth section, I depict the implementation of the reform policy in the two villages, identifying the differences between documented policy and actual practice and paying particular attention to the different governance levels and actors' roles in the policy implementation process. Following this, I describe local participation in and understanding of the reform, using a quantitative approach, to further describe the local perspective of the forest policy and its implementation. The fifth section examines local perceptions of tenure security as the key outcome of the policy implementation. The discussion section following provides a more analytical discussion based on the empirical findings, and the next section summarizes and concludes the chapter.

7.2 Forest tenure policy for collective forest: A historical overview

7.2.1 The emerging collective forest

After the founding of the People's Republic of China in 1949, the Chinese Communist

Party launched the first of many dramatic changes to land and forest tenure, bringing all farmland and forestland under centralized control and eliminating all forms of private property rights. The government confiscated all forest owned by landlords and rich peasants and redistributed it equally to individuals, in particular the poor. This campaign covered the nation with the exception of Tibet and border areas in Yunnan, where minority ethnic groups resided and practiced their strong customary common property regimes (Liu 2001, Xu J.C. and Ribot 2004). Mao's land reform campaign to distribute land to the poor and landless was welcomed by the majority of peasants, and was the landmark of the establishment of the socialist system.

However, in the mid-1950s a collectivization process was initiated to withdraw individually-managed forestland for collective management under the commune system. The collectivization policy pooled farmland and forest resources for collective landholding and divided the returns to individual households according to the proportion of land and other resources contributed to the collective. Village cooperatives were set up as the entity of forestland holder, and farmers enrolled as cooperative members to secure their access to farmland and forestland (Grinspoon 2002). As the village elders in Pingzhang and Xinqi recalled, the collectivization was highly centralized, with all activities from tree planting to harvest and distribution controlled by the cooperative, which in turn was answerable to a higher level of government: the commune. Individual farmers had no say in decision-making regarding the management of the collective forest. The collectivization policy continued throughout the years of the Great Leap Forward and the Cultural Revolution from the mid-1950s to the end of the 1970s. The collectivization however created many environmental and economic problems (e.g. Menzies, 1994, Shapiro 2001, Grinspoon 2002).

7.2.2 The first round of tenure reform in collective forest

In 1978, the radical collectivization of production and administration was eliminated as market liberalization and decentralization reform were introduced. The reform began with decollectivization across the entire nation to redistribute the use rights to

collective farmland to individuals under the Household Responsibility System. The decentralization of property rights from the prior system of centrally-administrated collectives provided a strong incentive for farmers' self-governance and decision making in land management. As the agricultural land reform was successful, the forest redistribution took a similar approach and began in 1982 with the aim of promoting afforestation and effective forest management to alleviate poverty. This reform of forest tenure consisted of three components, directly translated as "Three Fixes"[1] (*Linyue Sanding*), which were: 1) the issue of certificates to confirm existing forest boundaries and property rights to stabilize forest tenure; 2) distribution of collective non-forestland to rural households (called "Freehold Mountain" or *Ziliushan*) with the aim of providing incentives to individuals to engage in afforestation; and 3) the introduction of the "Responsibility System" to set up "Responsibility Mountain" (*Zerenshan*) in collective forest with contract base to improve silvicultural operations and forest management.

In the Freehold Mountain reform, the collective entity, including the administrative and natural villages, is still the forestland holder and owner, with individual householders granted usufruct of forestland and further ownership of the trees they plant once they have established new forest (also see Liu and Edumnds 2003, Miao and White, 2004). If a household does not perform the afforestation required within three years of the being allocated forestland, the land is subject to withdrawal. In 1998, transfer rights to forest resources were also granted to individuals according to the revision of new forest law.

The Responsibility Mountain policy transferred some management and production responsibility, such as for forest cleaning and protection, to households for a contracted term of five, ten or fifteen years while the collective retained ownership of both land and trees (Liu 2001, Liu and Edmunds 2003). Households had no right to transfer these resources and had only limited control over the harvest and sale of the

[1] Based on confirming forest property rights, the Three Fix policy attempted to redistribute collective forestland based on "Freehold Mountain" and "Responsibility Mountain". Therefore, the policy was also known as "Two Mountain System" (see also Chapter 4).

trees. They shared the income with the village collective, according to terms agreed between them.

Table 7.1 Types of forest tenure and management in collective forest

Tenure categories	Use rights and ownership
Freehold Mountain (*ziliushan*)	· Collectively owned non-forested land · Individual households' use rights with free of charge · Individual households' ownership of tree stands after afforestation · Unclear duration of granted use rights
Responsibility Mountain (*zenrenshan*)	· Tenure not well defined · Collectively-owned land and existing trees · Individual households' operational and management rights · Contract-based benefit sharing between collective and individuals · Duration of forest use based on the contract
Collective Forest (*Jiti lin*)	· Collectively owned forestland and forest · Management obligation by the collective · Benefit and returns shared by the community or used for collective public goods
Joint shareholding system (*gonguanlin*)	· Jointly managed by groups of farmers · Groups have use rights to forestland · Benefit and returns shared among groups of individuals and village according to contract · Duration of forest use based on the contract
Contracted land (*sihuandi*)	· Collectively owned non-forested land · Individual from outside contracted use right · Individual ownership of tree stands after afforestation · Duration and rate of rents for forest use based on the contract

In practice, implementation of the forest tenure reforms led to diverse tenure arrangements according to local variability (see Table 7.1). In addition to Freehold and Responsibility Mountain, there is another tenure arrangement in which land is neither allocated, leased nor contracted to individual households. These areas remain the property of either natural or administrative villages and are managed by the village committee. This sort of shareholding system divides returns from the forest equally between the villagers (Liu 2001). The shareholding schemes also exist among groups of farmers who pool their resources, either on their own initiative or at the behest of

government, and divide the returns according to initial input (Miao and White 2004). Allocation of Freehold Mountain is expanding at the expense of Responsibility Mountain (Liu and Edumnds 2003). In 1992, degraded land was contracted from collectives to villagers and outsiders for afforestation under the Four Wastelands Auction Policy. Xinqi and Pingzhang have mixed tenure arrangements of all of these types, as discussed in the next section. Today it is difficult to define collective forest in China and polices continue to fluctuate, making the term ‘collective forest’ complex to define (Maio and White 2004).

The first tenure reform did not achieve the objective expected by government and its outcome was less positive. Rural people’s lack of confidence in the security of their tenure meant that allocation of Freehold Mountain did not generate much enthusiasm for tree plantation (Liu 2001, Grinspoon 2002). Studies report a decline in forest areas as market forces and badly-defined tenure arrangements led to many forests under Responsibility Mountain policy being felled for cash income (e.g. Xu J.C. et al 2005b, Zhang 2003, Zheng et al. 2001). This overexploitation of forests and shortsighted management of natural resources were encouraged by the policy’s short periods of tenure and ambiguities (Zheng et al. 2001, Ho 2001). In 1985, a harvest quota system was imposed to halt the rapid cutting down of collective forest, which, however, involved policy fluctuation and insecurity of tenure again. Central government stopped allocating forest in 1987 and the certification of forest remained pending. The problems of lack of institutional credibility and the uncertain benefits of forest management called for improvement of the reform policy in the forest sector.

7.2.3 The second round of tenure reform of collective forest

Learning from the previous reform, the second round of forest tenure reform paid great attention to forest privatization as part of a broader social and political trend, aiming for decollectivization of the rural landscape and the establishment of a free market (Xu J.T. et al. 2010). This reform was originally initiated in Fujian province, the main forest production region in China whose collective forest accounts for 85% of the province’s total forested area. In 2003, a large-scale pilot study was conducted by

Fujian's provincial government to allocate collective forest to individual households with clarification of individual households' rights to use and benefit from their forest. Thereafter, similar studies were carried out in Jaingxi, Liaoning and Hebei provinces. The privatization of forest use rights significantly improved forest management and economic returns in the pilot study, and central government called for nationwide reform in 2005. A new national policy was officially publicized by the Central Committee of the Communist Party of China and the State Council in July 2008. Up to the end of 2010, the forest tenure reform has been carried out in 28 provinces involving about 500 million rural forest dependants.

To ensure the stability and constancy of this reform, central government made a huge investment in it, even though forestry is not a key economic source of income for either the government or the majority of rural households (Wang 2008). The financial resources provided by central government covered the high cost of the reform. The government had invested approximately USD 370 million in the boundary delineation, surveying, titling and registration of the new plots in 2008 (Xu J.T. et al. 2010), and aims to accomplish its key mission to clarify property rights and contract forest to individual households in about 5 years. A series of policy reforms was also released to support the clarification of property rights, including reform of the harvest quota system, acceleration of the transfer of forest and forestland, support for the financial sector to enable the mortgaging of forest and the establishment of forest-dependants' associations.

The second reform emphasized a rights-based approach to decentralization, differing from the previous reform in its purpose: to ensure meaningful rights over forest. To ensure the privatization of forest, the key task identified by the government was to clarify and secure farmers' "Four Rights" of forest management: 1) clarification of property rights, securing farmers' ownership of forest and their right to use forestland, with a 70-year contract and the forestland still owned by the collectives; 2) decentralization of management rights: based on forest classification, farmers have the full right to make decisions about how they manage their non-ecological forest for

timber production and sale and the use of NTFPs; 3) the right of forest deposal, giving farmers the right to decide on the transfer, leasing and mortgaging of their forest; 3) the right to benefits, ensuring that farmers benefit financially from their forest. Central government expected this bundle of property rights, including land transfer, inheritance and mortgaging, to provide a strong incentive to manage forest to meet their demands and conservation. This right-based approach is a significant decentralizing step away from the top-down management planning of the past, providing individuals with significant forest management decision-making power.

Another key feature of the decentralization in the second reform was enabling local autonomy and self-governance in forest redistribution. This reform policy gives village assemblies full decision-making power regarding how much collective forest should be turned over to individual households and how much should remain collective. The portion not devolved to households remains collective forest, with rights vested in the democratically-elected village committee. The policy highlights “Three Rights” that should be assured in the reform process: 1) farmers’ right to information related to the national reform policy, the village plan for forest redistribution, dispute resolution etc; 2) the right to participate in any decision regarding forest reallocation, which should be taken by at least two-thirds of the total village population; 3) The right to make decisions, which should be approved with at least two-thirds vote majority of village representatives. To make sure this policy is followed, the implementors at village level are required to keep records for checking by a monitoring and evaluation team from a higher level of government. With this, central government aims to create a democratic decentralization, ensure local benefits and meet regional variability, creating a system requiring a combination of upward and downward accountability from intermediate government (local state).

However, the implementation of the policy has been mixed. Besides the goal of promoting local participation and securing local rights to forest, central government also encourages the privatization of collective forest that include using the percentage of privatization of total collective forest area as key indicator to evaluate the

achievement for each province. For instance, Yunnan's provincial government is aiming for 80% privatization of collective forest, although a majority of ethnic minority groups engage in a common property collective management practice in this province. In addition, while central government proposed a period of five years for the task of clarifying of property rights, provincial and local governments are pushing for a shorter period in order to demonstrate local capability so they can request further investment from central government. The clash between the state's goal and local practices is an interesting area for research into forest tenure reform and local dynamics.

7.3 Local property practice prior to the second reform

The local forest property regime is remaining dynamics and a mosaic of tenure arrangements, despite the several land reforms that have taken place. In particular, the first forest tenure reform redistributing collective forest in the 1980s had a profound impact on local tenure arrangements. Below, I briefly examine local property practice to provide a background and basis for understanding the second reform.

In Xinqi, as mentioned in Chapter 4, the forest was collectively owned during the collectivization period and thereafter fragmented as forestland was redistributed to individuals, as initiated by the village in the 1980s. As village elders recalled, two of Xinqi's natural villages started to allocate small pieces of non-forest land to individual farmers on a contract basis to encourage afforestation, with the collective forest remaining under the management of the collective forest farm. This local initiative was welcomed by many farmers as it allowed them to access forestland after a long period of collectivization. In 1982, the formal forest redistribution program – the Three Fix Policy – was implemented to delineate Freehold Mountain and Responsibility Mountain from collective forest. For this reform, Xinqi followed the policy of allocating most non-forested land to individual households as Freehold Mountain was based on family size, with people obtaining an average of 0.13 ha per capita. Collective forest not part of the collective forest farms was also redistributed to individual households under the Responsibility Mountain system. However, the allocation of Responsibility Mountain land led to serious deforestation, and conflict resulted from mining and

timber overharvesting after the forest redistribution. The village ex-head stated:

> *The forest reform is a good policy, but allocation of Responsibility Mountain did not clarify [our rights] or how long we can use the forest for. So people were afraid they would lose their rights and benefits from the forest, and they just cut as much as they could when it was redistributed.*

The village head and collective forest farm leaders called a village assembly in 1985 to solve the problem of this rapid forest loss. The meeting concluded with a common agreement to improve forest management by returning the contracted Responsibility Forest to the ownership and management of the collective forest farm, with future returns from the forest equally distributed in cash after deduction of the collective forest farm's management costs. Also in 1985, a logging quota system was applied nationwide, significantly reducing logging for timber in Xinqi village. As the village ex-head recalled, a great improvement in Xinqi's forest cover and quality can be attributed to this self-initiated recollectivization.

In 1997, the Xinqi administrative village began to redistribute a large amount of collective forest by itself as the forest quality and management improved. The collective forest was allocated to private individuals in the form of shareholdings, with each villager entitled to 0.1533ha. The allocated forest was assigned to different collective forest farms which took responsibility for their management and harvesting, with distribution of the benefits to be discussed among the villagers after the harvest. The benefits were either distributed to individuals in cash or invested in public goods. Over the years, the village used the benefit from forest for infrastructure and social development including building schools, a clinic, an elders' centre and a roads, and paying social insurance for all villagers. In sum, there were three types of property rights arrangement in Xinqi: 1) Freehold Mountain managed by individual households; 2) collective forest at the natural and administrative village level, managed by collective forest farms with a joint shareholding system; and 3) small areas contracted to outsiders in the mining area.[2]

[2] For outsider contracting of forest for mining see also Chapter 4.

In Pingzhang, the forest ownership was held by Yangliu commune (now Yangliu township) but managed by Pingzhang village during the collectivization period. As mentioned in Chapter 4, Pingzhang's forest resources were exploited by the government to supply wood for industrialization during the Great Leap Forwards. There was little decision-making at the village level. Since the 1982 forest reform, the Three Fix Policy attempted to establish Freehold and Responsibility Mountain with the aim of encouraging farmers to plant and protect trees. Farmers have been allocated the marginal degraded forestland as Freehold Mountain for afforestation, but some of it is extremely degraded and unclear tenure arrangements in terms of ownership and period of use rights offered farmers little motivation to plant trees. Much of this land has been abandoned for grazing, and farmers call Freehold Mountain as "Old Female Pig's Mountain", because there are very few resources on the forestland apart from weeds, which are only useful for feeding pigs. Moreover, farmers allocated Freehold Mountain land in good locations farmed it for their subsistence. Although few trees have been planted on Freehold Mountain three years after the distribution, the village has not taken it back from individuals. As most interviewed farmers stated, this is because each household only received a very small area and the village does not want create conflict over this small area.

Pingzhang only redistributed one third of the forest as Responsibility Mountain, as most people wanted to keep the collective forest for communal use. For instance, the collective forest at Dazhai natural village remained under collective management to protect the watershed and the Yi minority's sacred forest. Other natural villages' forests remained collective for the gathering of firewood, grazing and so forth. However, a significant area of allocated forest was subject to overexploitation due to unclear property rights, and the village concerned had had to take back the land, which was later contracted to outsiders for afforestation under the Four Wasteland Auction Policy. Before the second forest tenure reform, the property rights arrangement in Pingzhang was as Freehold Mountain managed by individuals, collective forest at the natural village and administrative village level managed by the

natural villages and village committees respectively, and significantly degraded collective forest contracted to outsiders.

In summary, the first reform was applied in both villages as a top-down approach to forest allocation led by county government and the forest bureau, which ignored the local context and dynamics of forest management. For instance, the ethnic sacred forest in Pingzhang and existing institutions of collective forest farms in Xinqi were not considered in the allocation of Responsibility Forest. Later, with the launching of the restricted quota system, government efforts at forest redistribution ceased, leaving the first forest tenure reform incomplete. The second reform was implemented in 2006 to secure and clarify individual households' forest property rights, as discussed in the following sections.

7.4 From central to local: Policy implementation and interpretation

The second round of forest tenure reform in Yunnan was implemented in two key stages. The first stage, in 2006, involved a pilot study in nine counties including Tengchong, where Xinqi village is located. The second stage, introduced in 2007, included the entire province. In the section below I compare policy implementation and interpretation in the two case-study villages to show how the same policy was implemented and interpreted differently in different places over time.

7.4.1 Xinqi as the pilot site

As mentioned, Xinqi has a large proportion of collective forest which makes a significant contribution to the village development. The collective forest is of two types; forest collectively owned by the administrative village and forest collectively owned the by natural villages. As Tengchong county was selected as the pilot site in Yunnan, the reform in Xinqi was carried out in 2006. The provincial government invested considerable financial and human resources in this pilot site. A number of foresters were seconded from other counties to support the study in Tengchong throughout the process from the boundary delineation, surveying and titling to the registration of the new plots. Also, since it was the pilot site, the national guidelines were strictly followed

to clarify the Four Rights of forest tenure and secure the Three Rights in the reform process. To ensure the village autonomy and variability, the provincial government followed the principle: “One administrative village, One strategy; One natural village, One plan”, as proposed by central government. This allowed local decision-making to address the village’s specific context. The provincial government also launched a principle called “Mountain Equilibration”, which sought to distribute existing collective forest to individuals based on the population of the village so that everybody was allocated the same amount of forestland.[3]

The reform started in Xinqi in May 2006, when a forest tenure reform task team was formed in consisted of forest officials from county and township government, the village head and village representatives. The team started with the policy publicizing to detail explain the state policy and provincial guidelines. Through village representative meeting village assemblies as well as posters, the policy publicizing is aimed to provide farmers with information and a feedback mechanism also set up to help the reform team to understand local needs. Thereafter the village head and village representatives drafted the plan, which had been further discussed and approved at a village representative meeting, before announcing it to all villagers on a poster that invited villagers to make their comments known within seven days. The village committee then submitted the plan for approval on 26 July, 2006.

The Xinqi farmers had agreed that the more than 2670 ha of collective forest owned by the administrative village would not be reallocated and would continue under the control of the collective forest farms. This forest was divided into 17 plots, based on geographical location, for title certification, with the village committee members and other village representatives as the certificate holders. The tenure arrangement for the natural village’s collective forest continued the agreement that the village had initiated in their self-initiated redistribution of 1997 with a joint shareholding system. The certification thus adopted the same approach as that taken at the administrative

[3] Mountain Equilibration is the principle of distributing the existing collective forest to individuals equally based on the existing population of the village, with the aim of ensuring that everybody has the same amount of forestland.

village level. Regarding private forest, the second reform was more or less simply a certification process for areas of Freehold Mountain that had been delineated to individual households in 1982 and for mountain areas contracted out to mining enterprises.

The forest tenure reform in Xinqi did not make much difference to the previous tenure arrangement or portions of forest held by individuals. As a result, the village kept a considerable amount of collective forest, and this conflicted with the national goal of privatization. This village plan was discussed in the Tengchong County Forest Department with officials advocating for the individualization of collective forest, and the deputy director of the department even came to discuss this with the village head. As the village head recalled:

> *I used three arguments to persuade the director to approve our case. First, I said: "According to the policy, once two-thirds of the villagers approve the plan we have to follow this collective decision, based on Village Autonomy Law [Village Organic Law]. Second, collective management of the forest has greatly benefited the local economy and the village so that we do not require external money for road construction, school building and so forth. We should keep this collective forest. Third, we have had bad experiences in the past with allocated forest rapidly cleared. For its ecological function and economic reason, we need to keep the collective forest."*

The county forest department finally approved Xinqi's plan to keep a significant area of collective forest under the joint shareholding system. There was a similar case in other pilot counties where villagers wanted to keep a large area of collectively-owned forest. As a result, only 50% of total collective forest area was privatized in the pilot study by the end of 2006, as opposed to the provincial government's commitment to as the state to privatize over 80%. This directly affected the province's image at the national level, as the provincial government was ambitious about implementing the policy exactly as required, given the large amount of collective forest. So, the vice-governor of the provincial government organized a number of foresters to conduct a series of studies of the individualization of collective forest in Fujian province, and committed to accomplishing property rights clarification within three

years under the Forest Tenure Reform Act, two years less than the national timeframe of about five years. Thus, the detailed provincial guidelines were amended when the reform was rolled out across the entire province apart from the Tibetan region.

7.4.2 Forest tenure reform in Pingzhang

In 2007, the forest tenure reform was extended to the whole province apart from the Tibetan region. Pingzhang was included in this second stage of reform. As before, the "One administrative village, one strategy; one natural village, one plan" and Mountain Equilibration principles were adopted. Learning from the pilot study, the provincial government explained in its forest reform guidance that different types of Mountain Equilibration could be regarded as privatized collective forest: 1) collective forest redistributed to individual households with individually-titled certificates; 2) joint shareholding, with groups of people holding equal shares; 3) collective forest delineated as ecological forest and kept as such and not distributed. This amendment aimed to increase the rate of privatization and to reduce the government workload as it extended the reform to the whole province.

In Baoshan there were not enough foresters in the forest department for the overall process of surveying, titling and registration, etc. when the reform was expanded across the whole prefecture. However, the prefectural government still announced that it would complete the property rights clarification within two to three years, and would attempt to reach a privatization rate of over 90% of total collective forest area. As Mr. Zhou from the forest department stated:

> *During the pilot study in Tengchong almost one-thirds of foresters from four other counties were seconded to support the reform. Now the reform has been extended to the whole of the Baoshan prefecture … I really cannot imagine how we can complete it in this short period of time.*

In the Prefectural Forest Reform File of 2007, the prefectural government clearly states that the joint shareholding system is the best practical approach to the individualization of collective forest. So apart from the forest title certification for individual households, the government also prepared a Shareholding Certificate to

prove that the benefits of the collective forest were shared equally among several households even though the forestland itself had not been distributed. Mr. Huan from prefecture forest department has explained:

> "*…….the shareholding certificate is really a tricky innovation that the forest department did not actually need to work at the household level so that they complete the tenure reform timely. In most cases, people only need certify the previously collective owned forest by the production team as a shareholding forest of this production team. Then, they can claim the reform is completed with 100% privatization at this production team, but individual households do not really received any pieces of forest……That, however, might cause a lots of problem and probably conflict in future……"*

The forest tenure reform started in Pingzhang on 16 July, 2007, when the township government and county forest department convened a meeting for the village committees of all administrative villages to introduce the policy and the task ahead. At the meeting, the deputy township director clearly stated the basic principles and priorities of the reform, including: 1) clarification of the boundaries between villages; 2) allocation of Freehold Mountain titles to individual households; and 3) in principle, no distribution of collective forest in order to complete the forest reform quickly; in the case of major disputes the distribution of collective forest could be carried out at the natural village level. The government officials required all villages to follow these principles. A reform task team of township forest officials and Pingzhang village committee members was formed. The policy was presented first to the natural village head and village representatives, who were expected to distribute the information to local villagers. Again, the village head stressed that this reform aimed to provide farmers with certification and rights, but he did not highlight the privatization and distribution of collective forest to individual households. Thereafter, a plan for each natural village and an overall strategy for the administrative village were created by the task team and announced at a village meeting, before submitting them for township government approval. There was, however, little local involvement in decisions about how and how much of the collective forest would be distributed. One natural village head complained:

Our forest was distributed by the village committee. They just closed their office door and wrote up the plan. Then they filled out the forest certificates and stamped them. We only knew what we had when we got the certificates, and many of us still do not have our certificates.

In general, the forest tenure reform in Pingzhang strictly followed the county and township's intentions for forest distribution. After the reform, the collective forest at administrative village level remained collectively managed and jointly held by village representatives with a single forest title certificate. However, there is neither a shareholding agreement system nor a Certificate of shareholding, because no shareholding system was actually established in the village. As for natural village collective forest, only one of the five natural villages, Xingzhaizi village, redistributed its collective forest to individual households, following a dispute when its villagers complained of deforestation and illegal logging in their collective forest, and of the significant commission of their collective forest being contracted outside without any redistribution of its benefits. The other four villages followed the administrative village system of shareholding without an agreement. Title certificates had been issued for Freehold Mountain and forest contracted out before the reform based on previous agreements. Thus the tenure reform in Pingzhang also did not practically change the property rights arrangement much, although the majority of farmers had expected collective forest to be redistributed to individuals. It was more or less just a matter of certification.

However, this practice was not accepted by central government when it realized that many provinces were not actually distributing their collective forest despite the goal of privatization, as stated in the National Monitoring and Evaluation Team report. With pressure from central government, in early 2008 the provincial government re-stressed the allocation of collective forest to individual households and Mountain Equilibration. The government requested villages where collective forest only had one or two title certificates jointly held by large numbers of villagers to readdress their tenure reform and actually distribute their forest. Pingzhang, of course, was included in this request. According to comments from the prefectural government's monitoring

and evaluation team, the village should redistribute its collective forest to smaller joint holding groups and set up a shareholding system. The village committee and township forest officials, however, did not start to actually reallocate the collective forest, as time limitation. They broke down the collective forest into seven plots based on geographical location and filled out seven certificates to replace the previous single certificate covering the whole collective forest. On each of the seven certificates they put a short list of villagers, therefore meeting the province's regulation requiring that they avoid "one village with one certificate for all the people". They also amended the certification of collective forest belonging to the natural village. This became common practice throughout the province to increase the rate of privatization of collective forest.

7.5 Local participation and understanding of forest tenure reform

The above section has examined the process of tenure reform implementation and policy interpretation in different villages at different times. Table 7.2 quantifies local participation in Pingzhang and Xinqi according to the village survey. It is clear that there was more local participation in Xinqi than in Pingzhang throughout the process: 81.7% of interviewees in Xinqi were involved the policy-publicizing meeting and 68.3% in planning at the natural village level, compared to 55.8% and 41.9%, respectively, in Pingzhang. Pingzhang did not meet the policy requirement that two-thirds of the total farmer population participate. As for the planning process at administrative village level, neither village met this policy requirement, although Xinqi was closer at 35% than Pingzhang's 20.9%.

Local perceptions of who actually did the planning at natural village and administrative village levels also differ. In Xinqi, with its higher participation, more people saw the administrative village committee, natural village head and farmers as the three key actors in making the reform plan (see Table 7.2). Interestingly, the frequency of response regarding the farmers doing the planning is higher than for any level of government. This reflects strong local autonomy in policy implementation in Xinqi. In contrast, Table 7.2 indicates that in Pingzhang the township government was the

dominant actor in making the plan, with farmers playing a minor role in decision making. Apart from these differences, the administrative village committee was commonly seen as the key decision-making actor in the reform. As it coordinates relations between the local government (the state) and farmers (society), its accountability is largely affected the local participation in the reform. Although the administrative village committee is an elected body following Organic Law on village autonomy, its accountability is varied from local context.

Table 7.2 Local participation in forest tenure reform

Questions to villagers	Pingzhang (n=39) Frequency %	Xinqi (n= 60) Frequency%
Did you participate in the policy publicizing meeting?		
Yes	55.8	81.7
No	34.9	18.3
Did you participate in the natural village planning?		
Yes	41.9	68.3
No	48.8	31.7
Did you participate in the administrative village planning?		
Yes	20.9	35.0
No	69.8	65.0
Who made the plan for the natural village?		
County government	15.4	6.7
Township government	30.8	6.7
Administrative village committee	28.2	26.7
Natural village head	5.1	21.7
Farmers	7.7	33.3
Don't know	12.8	5.0
Who made the plan for the administrative village?		
County government	12.8	8.3
Township government	38.5	11.7
Administrative village committee	28.2	48.3
Natural village head	0	3.3
Farmers	7.7	20.0
Don't know	12.8	8.3

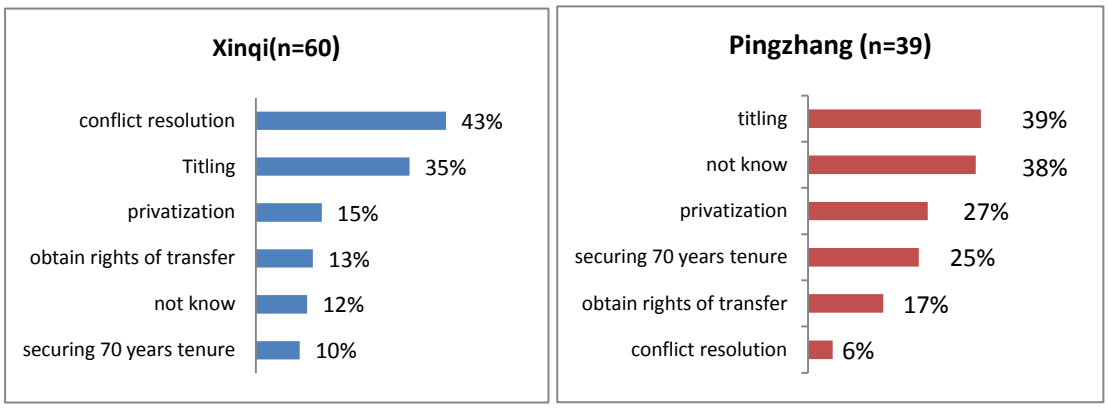
Source: Village survey, 2010

All of the 60 interviewees in Xinqi stated that they had forest title certification compared to only 59.5% of the 39 sampled interviewees in Pingzhang. All of those who had not received certification had not received a certificate of shareholding either,

the two top-ranking reasons for this being “Not known” and “Village head kept the certificate”. In Beishuihe natural village (a Bai village) of Pingzhang, for example, the tenure reform team did not even consult with the farmers, only visiting to delineate the boundaries between natural villages. As this is the Bai village that settled later and did not receive Freehold Mountain, their forest was collectively held before the reform. The natural village head was given five certificates for five collective forest plots stating that they were jointly held by small groups of farmers without a sharing system. As the natural village head said:

> *I cannot ever pass these forest titles to any individual, although everybody would like to have a plot of forest of their own from the collective, because none of the farmers has actually been legally allocated forest. The forest is still collective-owned. If I distributed these certificates to individuals it would cause a big conflict and disputes.*

Figure 7.1 Local understanding of forest tenure reform



Source: village survey in fieldwork 2011.

Like the differences in the implementation of the policy in the two villages, local understanding of forest tenure reform also differs in the two villages. As shown in Figure 7.3, it is clear that the majority of the farmers in Xinqi perceived conflict resolution and forest titling to be the most important objectives of the reform. The reform policy was welcomed as it clarified boundaries, and the titling provided farmers’ with secure rights to manage the forest from which they can benefit in the future. In contrast, the majority of farmers in Pingzhang did not know the objectives of the reform and saw the titling as a key element of it. The implementation of the “Three

Rights" in planning and decision-making of reform directly affected the national goal of for clarifying and securing right to farmers. The reform was largely shaped by local accountability and power structures; I return to this in the discussion section of this chapter.

7.6 Local perceptions of the bundle of rights to forest after the reform

The national goal of providing forest tenure security to farmers through forest titling guaranteeing 70-year use rights was shaped by the implementation of the policy. The security of forest tenure, however, practically derived from local practice and perceptions of bundles of rights to forest which guide everyday local property practice. A property rights index of nine key rights related to forest management was developed based on the surveyed farmers' perceptions of their forest rights, and overall property rights scores computed by simply adding the scores for each right, as presented in Table 7.3. A higher score implies a greater sense of security about a particular property right. A statistical comparison of the two villages was performed to obtain an understanding of local perceptions of tenure security via a quantified approach.

Table 7.3 Property rights index in Pingzhang and Xinqi

Types of rights to forest	Pingzhang (n=39)	Xinqi (n=60)	T	p
	Mean ±(S.E.)	Mean ±(S.E.)		
Right to convert to cropland	0.141(0.051)	0.325(0.049)	-2.590	0.011
Right to convert to orchard	0.481(0.074)	0.617(0.543)	-1.499	0.137
Right to decide tree species	0.763(0.067)	0.933(0.030)	-2.343	0.023
Right to harvest timber	0.308(0.028)	0.375(0.023)	-1.862	0.066
Right to practice agroforestry	0.769(0.066)	0.988(0.009)	-3.252	0.002
Right to harvest NTFPs	0.846(0.059)	1.000(0.000)	-2.629	0.012
Right to transfer to villagers	0.654(0.073)	0.775(0.039)	-1.461	0.149
Right to transfer to outsider	0.609 (0.073)	0.604(0.049)	0.055	0.956
Right to mortgage for load	0.359(0.075)	0.746(0.052)	-4.259	0.000
Overall property right scores	4.930(0.388)	6.363 (0.153)	-3.440	0.001

Notes: 1) for property score index: right =1 if yes, right= 0.75 if yes but required village approval, right=0.5 if yes but required township approval, right=0.25 if yes but required approval from both village and township, rights = 0 if no. 2) T- testing performed for comparing the mean, significant level at 1%, 5% and significant level at 10%.

As shown in Table 7.3, the sampled farmers in Xinqi had stronger sense of tenure security than those in Pingzhan, with a significant difference ($p \leqslant 0.001$) in the overall property rights score. Of the nine different rights to forest use and management, Xinqi had a significantly higher score than Pinghzhang in all but three: the right to convert to orchard; the right to transfer to villagers; and the right to transfer to outsiders. The new forest tenure reform is commonly seen to be promoting the right of transfer, while farmers see the right to convert to orchard as part of the government's policy to promote walnut plantation. Another extreme is the significant differences regarding the right to mortgage in exchange for a loan ($p<0.0001$). Although the government encourages farmers to use their forest to obtain bank loans, more farmers in Xinqi than Pingzhang had understood or experienced this. When the government started the pilot in 2007, a Forest Service Centre was established to help farmers to access credit from banks based on their forest property. Apart from these differences, Xinqi and Pingzhang both scored very low on the right to harvest timber. The timber harvesting quota is still a main constraint to forest tenure security.

Based on this comparison, it is clear that a well-implemented policy of forest tenure reform leads to better local perceptions of tenure security. However, a well-implemented policy requires not only a downwardly-accountable local institution but also better governance structure to ensure that local voices can be heard and local needs met. Top-down policy implementation has resulted in relative insecurity about property rights. Without the opportunity to participate in the overall policy reform and implementation process, farmers lack a sense of ownership of the change overall. Moreover, the low participation has not created sufficient understanding, confidence or trust in the forest redistribution policy and many farmers expressed concerns about the changes.

7.7 Discussion: Power, accountability and the local state

This chapter has examined the local dynamics of forest property rights across two villages, focusing on the policy process and the implementation of the second round of forest tenure reform. It has presented the immediate outcomes by examining local

understandings and perceptions of the security of the new forest property rights. Drawing on the findings from the empirical case study, this section discusses the theoretical and empirical implications in three key areas.

7.7.1 Local states and accountability

As the research findings show, well-implemented policy leads to a better and more positive outcome and accountability mechanisms shaping the policy process in which the local state at township and county level plays a critical role. Since the decentralization, the empowered local states have exercised considerable power in response to the various forest decentralization programs. They are able to mobilize central government resources locally; however, they do so in their own interests, aiming for political achievement. In this sense, because local governments are embedded in an ever-changing legal and institutional environment, their effectiveness depends in part on a polycentric governance system in which their links with external actors, especially central government organizations, are critical (Andersson 2004).

In Xinqi, a pilot site from which government at each level intended to learn by experience in the field, there were better feedback and communication channels between villagers and government. This accountability mechanism was built through transparency and openness to the policy information (Ribot 2004). Farmers' request to retain the collective forest was easy to send to the township and county levels and received a positive response, and the local state at township and county level abided by the principle of village autonomy. A good historical reputation for the collective management of forest created trust between villagers and government so that the reform was implemented in participatory ways to meet local needs. This also contributed to the accountability mechanism (Ribot 2004). This communication and feedback system enabled the village head to be downwardly accountable to farmers, who eventually had a major say in planning their tenure arrangements. The involvement of villagers in decision making improved the good governance for polycentric system, which in turn improved the accountability mechanism and helped the local state to act as facilitator between government (state) and farmers (society).

In contrast, in Pingzhang, included with the extension of the reform, there is a mandatory quantified standard for privatization rate set up by higher government before the implementation. Feedback and communication channels no longer existed, as higher-level government did not seek to learn from the field and was more interested in seeing that the policy was implemented as planned and the mandatory standard can be met. This largely limited the potential for decision-making at the township and county levels to meet local needs. The local state therefore adopted selective policy implementation to accomplish the reform within the timeframe set by higher-level government. The reform plan at village was carried out by the village leader together with township officials to meet the requirements of the township and county, denying village autonomy. As a result, elected leaders at the community level were more upwardly accountable to government at the township level and responded little to farmers' concerns.

This has been particularly true at the township and county levels, where government receives considerable power and resources but there is little power transfer to the community level. Downward accountability at village level largely depends on higher-level accountability systems and the overall governance structure. Because few local governments are likely to be effective on their own, one of their key tasks is to facilitate cooperation between the governance actors at different levels (Andersson 2004). Transparency, communication, local reputation and a polycentric system are key accountability mechanisms that help to explain why some local governments are more effective than others in terms of both forest user satisfaction and forest tenure security.

7.7.2 Top-down or bottom-up: where the power lies in decentralization

The central government reform was intended to promote greater local autonomy in particular village and household level decision-making, but the implementation of the reform programs was conducted in a typically government-dominated way, particularly in when rolling the policy out, because most of those who designed the programs were in higher-level government. However, there was good local participation in the

pilot study. It is therefore interesting to consider how the power exercised at different levels lead to this difference.

At the local level, the research findings discussed in this chapter reveal the underlying reasons why elected local bodies in the community had little say in the forest reform program, even though central government had specified that there should be decision-making power at the village and household levels. Taking Lukes' (2005) three-dimensional view of power, local decision-making power was extremely restricted by non-decision-making power in the context of local structures and bureaucratic relations. Township- and county-level government has the power to allocate resources, set up local monitors and interpret policy, limiting the exercise of real decision-making power by elected community leaders. In Pingzhang the policy implementors interpreted joint shareholding as privatization, which was economical, could be completed within the time limit for the reform, and avoided redistribution of the collective forest. Although a large number of farmers wanted to privatize collective forest, their decision-making power regarding the tenure reform planned was limited. The tenure reform team used so-called pre-selected "farmer representatives" to get the village plan approved. Clearly, the power of the community is structured in a broader context of administrative governance of hieratical government body. Thus it is incorrect to say that Chinese forest policy is top-down; it is rather that the implementation of the policy is top-down as a result of structural matters and social-political relations.

At the prefectural and provincial levels, a shortened timeframe for achievement of the reform was set that limited the local state's potential to actively allow local participation at the same time as following the central regulation strictly. The bureaucratic governance structure thus ignored and denied local feedback, leading to policy compromises and risking unforeseen environmental outcomes (Guan et al. 2010). This bureaucracy also created an institutional structure in which power was exercised to ensure inaction on privatization, as the notion of Lukes (2005). Bias on the part of those in power excluded issues from the agenda. As shown, in Pingzhang

there was no allocation of collective forest, with only titling stressed in the local plan. Selective policy implementation by the local state aimed to prevent village decisions on forest distribution being made about areas with an observable conflict of interests, seen as embodied in express policy preferences.

Many evaluations of the effectiveness of the implementation of the policy in the pilot study relied entirely on short-term assessments by scientists and central and local government managers with a vested interest in reporting positive results rather than relying on carefully controlled, long-term field-based monitoring (Shi and Rao 2010). Thus the assessment may contain a serious bias toward short-term, non-holistic solutions that often favor forest managers and local officials who want to start and accomplish the tenure reform quickly to demonstrate their capability and political achievement. The application of the policy in the pilot was very different to its full-scale implementation. This difference also resulted from the bureaucratic governance structure.

7.7.3 Power and knowledge

Lukes' third dimension of power helps to us understand how power was exercised in the forest tenure reform. Although a post-socialist country, Hardin's (1968) "tragedy of the commons" theory dominated the belief that privatization would lead to effective natural resource management. This thinking became more dominant with the economic success of the privatization of the industrial sector, agricultural land reform and market liberalization and the Chinese government adopted decollectivization for the first privatization of forest following the successful agricultural land reform of the 1980s. However, the reform was not completed and created ambiguity about forest ownership (see also Ho 2001, Liu 2001). A second round of forest privatization followed to ensure individual households' tenure of forest plots, with the central state requiring a high rate of individual households' tenure in the reform to ensure that forest privatization is achieved. This thinking, however, ignores other complicated forms of property rights practiced in ethnic regions, and particularly in Yunnan province, where the common property regime plays a critical role in forest

management. In Xinqin, traditional practice entitles individual farmers to benefit from timber and non-timber forest products but the forest is managed and held collectively. In Pingzhang, collectively-held sacred forest serves local cultural needs and common interests. It is clear that state knowledge of forest management believes that the common property regime will lead to a “tragedy of the commons” and has ignored local customary rights and institutions. While the state also believes that giving individual farmers rights via privatization will automatically lead to sustainable forest management, in practice it has exercised its power to avoid local community decision-making about the design and planning of forest reform.

Forest is considered only from the scientific point of view as an economic and ecological resource, with the goal of forest tenure to promote local development and afforestation through the individualization of forest property rights. Forestry scientists do not include the cultural dimension in their considerations. In Pingzhang, the sacred forest is communally managed to meet local cultural needs that however had been asked to distribute to reflect as individual forest. Although it has not been actually distributed, this ignorance of local knowledge and culture creates a risk of conflict. More importantly, it constricts the possibility of local practice and culture being recognized. Other examples also can be found in the Tibetan region of Yunnan, where the Tibetan people’s sacred landscape has been ignored, and local access for cultural activities denied, while the development of tourism and environmental conservation is promoted (Litzinger 2004). Clearly, scientific forestry exercises power to only allow forest to be managed for economic and ecological return, denying customary rights and the cultural dimension.

7.8 Conclusion

This chapter has examined the forest tenure reform policy process, implementation and outcomes. The Chinese government is increasing its investment in decentralization of the forestry sector to improve the efficiency of forest use and conservation. In particular, forest tenure reform has provided an incentive to individual households by according them land use titles that aim to break down the previous

commune system of collectivization. At the same time, the policy document clearly states that there must be village autonomy in the reform to encourage local participation, volunteerism and decision-making. However, the policy implementation manifested multi-faceted relations between various centers of decision-making in a sophisticated manner involving decision-making on many levels. This chapter has shown that the effectiveness of forest decentralization largely depends on local politics and the overall governance structure exercising the power. Better use of pilot study data is recommended, to ensure that reform extension is properly informed in future.

Chapter 8

Conclusion

This thesis has examined a range of forest management governance issues in the context of China's decentralization process. The materials and analysis are based on fieldwork in Yunnan Province. Using a conceptual framework, presented in Chapter 3, the research has generated a range of empirical and theoretical findings that critically reveal the dynamic process of decentralization and state-society relations in forest management. This conclusion does not repeat the findings from the three fields of forest governance investigated – harvest quota, the SLCP and forest tenure reform – but instead discusses a synthesis of the key findings from a theoretical point of view. And, it also attempt to answer the research questions formulated in Chapter 3 in order to improve the understandings of interactive processes between policies and local institutional dynamics in shaping forest decentralization in China. The chapter has five sections. Immediately following this introduction, I present a summary of the major empirical findings. This is followed by a section presenting a synthesis of the theoretical discussion of research findings that links the empirical data to the theoretical review in Chapter 2. For an empirical matter, section 4 discusses policy implications and recommendations based on the research findings, and the chapter concludes with a discussion of the challenges experienced while carrying out the research and offers suggestions for further research.

8.1 Major empirical findings

The research has generated a wide range of empirical findings from the extensive fieldwork and analysis. This section presents a concise summary of the major empirical results before the theoretical discussion of these findings in the following section.

It is clear that forest decentralization in China has been established in law but not in practice. While the central government generally promoting decentralization, the implementation has lead to an ambivalent reality. Over time, central government has moved from a distribution of rights, to local decision making and planning with the aim of transferring power over forest management to the local level. Different forest policies such as the SLCP in 2000 and Forest Tenure Reform in 2008, local rights and involvement have all been highlighted and stressed in policy documents to encourage individual farmers to act as the key agency of policy implementation. More currently, the policy has come to emphasize local decision making and autonomy, even using a quantitative approach to ensure that local participation in decision making in forest tenure reform reaches a certain level. Village Organic Law was implemented in 2000 to ensure democratic decentralization allowing village committees, elected by villagers, to take responsibility for their affairs and represent their voices. The decentralization implementation and practice has a strong legal foundation.

Although the central state has continuously invested in decentralization, the role of the village committee – an elected administrative body – in decision making is limited by a wide range of governance constraints as well as knowledge-based discourse, which I discuss in the next section. Those constraints and barriers allow elected village committees little meaningful decision-making power with which to utilize their representation of and responsiveness to local needs. Thus, the power that has been transferred to the lowest level of administrative body is insufficient. On the other hand, when the village committee is a well-organized local institution with a long-term relationship of trust and good reputation with officials and villagers, it has helped to build up local representativeness and responsibility for acting with higher-level government bodies to meet local needs.

The local state, as a strong local player in the decentralization, received a great deal of power and resources from central government as well as certain autonomy to make local decisions according to the local context. As found in this research, the local state is not just a policy implementer; it also creates local policy that shapes the goals and

strategies of the overall national policy agenda. However, its contribution to effective decentralization is arguable, as the accountability relations they are holding. The local state can selectively implement central policies to meet its own interests and they mostly however perform an upward accountability. They do sometimes perform with some degree of downward accountability to local farmers, as I discuss in next later section.

Third parties such as NGOs, academia and civil society organizations have an important role in the decentralization process as they provide an alternative way of improving local participation and involvement in forest policy implementation and management. The third sector can act as facilitator and coordinator to improve communication and dialogue between officials and farmers, helping local voices and needs to reach officials. Moreover, they can help to strengthen the application of local knowledge and practices and incorporate these in policy practice. Thus, they play a critical role as bridge and facilitator and provide power checks and balances.

There is a lack of recognition of local knowledge, indigenous practice and customary rights in the decentralization reform and process. Different ethnic groups have resided among the rich biocultural diversity of Yunnnan Province for many centuries and have developed a deep traditional knowledge of the environment and local institutions for resource management. Their knowledge is contextualized and adapted to their local situation. However, they have been largely ignored in the process from policy design and implementation to evaluation. Ignorance of local knowledge is part of the contestation between local and scientific knowledge, as I discuss in next section.

8.2 Theoretical discussions and implications

Drawing on the empirical findings of this study, this section provides a theoretical discussion based on the literature reviews in Chapter 2. As discussed in Chapter 1, theories on the decentralization of natural resource management are underdeveloped. To fill the gap, this research, therefore, seeks to 1) contribute to theories and understanding of democratic decentralization in natural resource management,

focusing particularly on various barriers and governance constraints that undermine the decentralization process; 2) improve the understanding of different accountability mechanisms that shape the outcomes of decentralization reform; 3) develop theoretical understanding of the dynamics of state-society relations in the decentralization process; and 4) explore dimensions of power beyond decision-making power that may limit decentralization. The rest of this section presents a theoretical discussion of each respect in correspondence to those theoretical expectations.

8.2.1 Limits of democratic decentralization

'Democratic decentralization' refers to a process in which powers and resources are transferred to authorities representative of and downwardly accountable to local populations (Crook and Manor 1998, Agrawal and Ribot 1999). Democratic decentralization is considered stronger than deconcentration (another primary form of decentralization), and the theory indicates that it offers the greatest benefits (Ribot, 2004). However, existing theory also suggests that the democratic decentralization of natural resource management is unlikely to take place (e.g. Ribot, et al. 2006, Tacconi, 2007).

China's government has put considerable investment into the decentralization of the forest sector, increasingly highlighting local participation and decision making from the first round of forest tenure reform, which provided local rights over forest, to the SLCP, highlighting local volunteerism, and the more recent second round of forest tenure reforms highlighting bundles of local rights and village autonomy in local planning and decision making. This research supports the theories that democratic decentralization is unlikely to be implemented, given the governance constraints.

This study has also found that central government has continued to implement recentralization in the decentralization process, which Ribot et al. (2006) see as state resistance to decentralization. For example, the harvest quota system undermined the outcome of the first forest tenure reform in the name of halting deforestation, causing

tenure uncertainty. The NFPP and SLCP, with the aim of protecting downstream watersheds and preventing flooding, have usurped village autonomy regarding forest management and land use rights, and central government has used the discourse of environmental protection and concern for public goods for the recentralization of control of local resources. As for the forest, a particular resource involved public concerns and benefit at different level from local, watershed, to global, there is likely that the recentralization take places to enhance state control (e.g. Tacconi 2007, Larson and Soto 2008).

At the village level, the limits of democratic decentralization are clear; insufficient power has been transferred to the local level, although village committees are constituted by local direct election based on Organic Law. Therefore, while there is a democratic decentralization in law, there is a big difference in practice. Elected village committees are empowered to handle local affairs as villagers' representatives in law, but in practice the decision-making power regarding the disposal of forest resources is held at higher levels of government. For example, the harvest quota is managed by the county and issued by the township government, with the village committee only facilitating the village's quota application (Chapter 5). SLCP land zoning and tree species selection was also decided at the county and township levels, while village committees could only facilitate implementation of the forest program (Chapter 6). The forest tenure reform decided in advance on the rate of individualization of forest plots and village committees were asked to meet the standards set at the prefectural level. The decision-making power of the village committee is extremely limited that restrict to improve their repetitiveness and responsiveness.

The research has also revealed the underlying reason why the elected local body at community level has little say in various forest programs, despite central government having clearly stipulated that local villages and households should have decision-making power. Viewed from Luke's three dimensions of power, local decision-making power has been extremely restricted by non-decision-making power contextualized in local structure and social-political relations. Higher-level township

and county government have the power to allocate resources and have set up local monitor indicators and policy interpretation that have limited the exercise of real decision-making power by elected community leaders (see, for instance, Chapter 6 policy interpretation of land and species selection and Chapter 7 pre-set up individualization rate for forest distribution). Clearly, the power of the community is structured within the broader context of administrative governance by a hierarchy of government bodies. It is not that Chinese forest policy is top-down; it is the implementation of the policy that is top-down as a result of more structural governance matters.

While this thesis supports the overall theories that various governance constraints are key factors obstructing effective decentralization, it also highlights knowledge for resource management and environmental discourse are another contesting ideological matter that limit effective decentralization. In rest of this section I discuss three key findings regarding limitations to the decentralization: 1) accountability mechanisms preventing effective decentralization; 2) the local state's role and state-society relations, which shape the decentralization process; and 3) the hegemony of scientific knowledge application as a constraint to decentralization.

8.2.2 Accountability and decision-making power

Accountability plays a key role in successful decentralization (Crook and Manor 1998, Agrawal and Ribot 1999, Ribot 2004, Ribot and Larson 2005). In particular, local government should be downwardly accountable to the local population, with local elections serving as the best form of democratic decentralization, as informed by theories. Local governments are empowered by their constituents, and in turn they will have best representation and more performed to be downwardly accountable to local populations.

This research has found that local elections made a limited contribution to successful decentralization. As discussed above, the elected village committees had little say in various forest programs as insufficient power has been transferred to the village level,

and the key resources of the forest program are still handled by higher-level township and county government. As a result, the elected village committee is apt to make itself upwardly accountable to the township government in order to put itself in a good position to gain further investment and resources. On the other hand, it does offer some degree of representativeness to villagers, but in line with higher-level officials' interests (see Chapter 6, for instance, the elected village head requiring quota from the SLCP to meet the demands of villagers). Moreover, as township officials and higher authorities are also in an appointing system for promoting, it is difficult to enhance their downward accountability. As Ribot (2004) argues, for decentralization to be successful not only must local institutions be downwardly accountable, but also other levels of government must be accountable to local government. The decentralization process cannot be achieved only through various policies such as forest tenure reform, local volunteerism in the SLCP and village autonomy; administrative reform of the governance structure is required at each level for policy success.

The research has identified several other mechanisms that may provide more downward accountability. First is reputation and trust, as shown in the case of Xinqi. The village has a good reputation for forest management which has been instrumental in building trust between the local population and government, and has enabled the village to ask for more SLCP quota and to exercise more autonomy in the forest tenure reform (Chapter 7), the SLCP (Chapter 6) and its application for harvest quota (Chapter 5). Again, with this trust with local community members, the Xinqi village committee has been able to formulate its own mechanism for distribution of the benefits of the SLCP to maximize the number of beneficiaries in the communities by including non-SLCP participants (Chapter 6). Furthermore, based on its good reputation and trust, the village committee was successful with its request to keep the forest collective rather than reallocate it to individual households in the forest tenure reform, securing farmers' needs. The village's good reputation and the relationship of trust holds the people and people want to maintain that their behaviors (Bourdieu

1977, cited in Ribot 2004), improving the accountability of both the village committee and local government.

Second, polycentric governance also plays a role in the balance of power that formed a structural aspect of accountability. Again in Xinqi, local village decision making incorporated into government decisions has become a significant form of polycentric decision-making mechanism that has improved accountability. For example, setting up a local harvest quota management scheme (Chapter 5), formulating SLCP benefit distribution mechanisms (Chapter 6) and the local forest tenure reform plan (Chapter 7) are all local decisions in line with the government's agenda. As highlighted by Andersson and Ostrom (2008), such highly polycentric systems are themselves complex, adaptive systems without one central authority dominating all the others in all policy arenas, and thus all the governance systems are operating at less-than-optimal levels given the immense difficulty of fine-tuning any complex, multi-tiered system.

In Pingzhang, as shown in Chapter 5, the involvement of a third party (ICRAF, an international NGO) not only provided critical independent monitoring but, more importantly, opened up space for the application and recognition of local knowledge. In this case, polycentric governance not only helped to balance the power but also helped in gaining power and recognition from government. As Ribot (2004: 109) argues, accountability can be increased by increasing the number of actors with a voice in policy and the ability of non-central actors to scrutinize central institutions, forming a balance of power which includes powers counter to central government.

Clearly, downward accountability can be set up through various mechanisms, of which elections are only one. Within the centralized and appointing system for promoting higher-level officials, the contribution of grassroots-level elections to downward accountability can be limited; I discuss the role of the local state in more detail in the following section. Multiple accountability mechanisms should be sought and encouraged to contribute to the success of decentralization.

8.2.3 The role of the local state and state-society relations

The empowered local state has been shown to be a key player that has exercised a great deal of power in response to various forest decentralization programs. The central state invested massively in the SLCP (Chapter 6) and forest tenure (Chapter 7) as programs that local states can handle. Local states are able to mobilize central government resources locally, although they do so in their own interests and with the aim of political success. As shown in the research, the local states acted against the central government policy aim of promoting farmers' voluntary participation and village autonomy in forest management. Their actions included selecting non-preferred local tree species in the name of economic development in Pingzhang (Chapter 6), constraining the individualization of collective forest in Pingzhang (Chapter 7), targeting sloping land with less steepness where it was easy to implement the SLCP (Chapter 6), and building patron-client relations to benefit local elites when quota was distributed (Chapter 5).

Thus, as Baum and Shevchenk (1999) argue, local states continue the practice of planning and monitoring while new institutional incentives increasingly encourage local officials to carry out their regulatory functions to maximize local rather than national interests. This street-level power of discretion given to the local state has actually been created by the cadre responsibility system for promoting, evaluation and monitoring local cadre performance (O'Brien and Li 1999), which emphasises the rapid, visible and easily-quantified measurement of evaluation. As a result, local government implements policy selectively as some cadres conscientiously enforce unpopular policies while refusing to carry out other measures that villagers welcome (ibid, Chapter 2)

The local state can performs to meet village interests independently of state policy as a result of local village struggles and negotiation. For instance, the local state selected walnut as an ecological rather than an economic tree in response to the village

committee's application, which enabled it to receive a better subsidy (Chapter 6). In Xinqi, although central government requires the individualization of collective forest, the local state has allowed villagers to keep significant collective forest after the village committee sent its request to county government (Chapter 7). Thus it is hard to find local states acting with purely upward or downward accountability; they have to be upwardly accountable to higher-level government in order to gain more resources and investment on the one hand, and to retain a certain level of downward accountability as they are close to the local people and know the needs of famers, on the other. This dilemmatic accountability, together with a significant transfer of power, enables them to set their own agendas requiring them to be responsive to both high-level government and the local community.

This can be theoretically understood using Migdal's concept of "state embeddness" in his model of state-in-society (1994, 2001). The local state in this model lies between central government and society and plays an important role in struggling to wrest power from the central state in response to local (society) needs, although it needs to remain accountable to the central state. Thus, rather than viewing state expanding its power and control in the decentralization, states and other social forces may be mutually empowering and the view of state embedded in society (Migdal et al. 1994). Some interaction between society and the state can create more power for both, although of course some interactions favour one side over the other, particular to local state.

This is true particularly at the township and county levels, whose governments receive considerable power and resources but do not transfer a sufficient amount of power to the community. As a result, elected community leaders make themselves more upwardly accountable to higher-level government and pay little attention to farmers' requirements. While the intention of central government is to promote greater local autonomy to make decisions across a wide range of state forest programs, particularly at the village and household levels, the implementation of these programs has been typically conducted from the top down. This is because most of the

designers of the methods of implementation of the programs are seated in higher-level county and township government. So a lot of power is decentralized to township and county government, but very little to the community level.

8.2.4 Power exercises and knowledge

Efforts at decentralization and their outcomes are also shaped by the degree of recognition of different knowledge systems and culture. While the state has invested in decentralization, it also exercises power in a knowledge-based pattern to obstruct democratic decentralization. Drawing on Lukes' (2005) notion of three dimensions of power, it is clear that in practice a great deal of power will never be transferred to the local level but exists as knowledge-based power struggles and contestation. As a result, state resistance to decentralization restricts the potential for local forest management and undermines the ability of locally elected bodies to make meaningful decisions.

As the research has shown, the scientific approach to forest protection is to keep it as "no touch forest" (Chapter 5), avoiding any kind of human interference. The understanding that if forest growth is greater than forest cutting there will be no deforestation is a narrow one that has largely prevented selective cutting, pruning, agrforestry and other forms of local sustainable forest management practices. The state exercises its power from the scientific forestry perspective of forest management, which only focuses on the economic and ecological value of forest, ignoring the cultural dimension (Chapter 6). From the scientific point of view, the keeping of sacred forest is regarded as backward and superstitious, as also argued by Xu J C. et al. (2005a) and Sturgeon (2010). As a result, Pingzhang's sacred forest has been required for individualization (Chapter 7), which has communally hold to serve for the whole community. The state has applied scientific knowledge to exercise power in many ways, including selecting tree species that limit the planting of multipurpose species; prohibiting intercropping in SLCP; and by afforestation that hampers other forms of practice to control flooding (Chapter 6).

The power that the state exercises may also be based on an ideological perspective that avoids possible decision making and action. The ideology of the “tragedy of the commons” (Hardin 1968) prohibits a common property regime and complicated local methods of forest-holding and management (Chapter 7). The ideology of upstream and downstream dynamics increases the tension between upper watershed agriculture practices and lowland flooding disasters (Chapter 6) (see also critiques from Blaikie and Muldavin 2004). The ideological understanding of nature as object without the perspective of the human dimension produces so-called “hard” science or scientific knowledge that seeks to “conquer nature” (Hobart, 1993). This has led to a “dominated acquiescence”, as Lukes (2005) argues, which believes that science is the only solution to natural disasters and successful natural resource management. Science, hard science and environmental engineering, however, have failed to consider the social dimension of natural resource management. In particular, they rarely understand that environmental failure is also governance failure (WRI 2004).

Previous research has focused on transfer of decision-making power (e.g. Ribot and Larson 2005, Larson 2005, Ribot 2004, Anderson and Ostrom 2008) and accountability (e.g. Agrawal and Ribot 1999, Ribot 2006) that argues that the democratic decentralization of resource management is undermined by central government using strategies that limit the kinds of power that are transferred and use local institutions that serve and answer to central interests (Ribot et al. 2006). However, they fail to observe that the incomplete decentralization and insufficient power transfer is also the result of a knowledge and ideologically-based power exercise (a non-decision-making power exercise) to avoid the possibility of decisions being taken and power being transferred. The fundamental matter of this knowledge and ideological-based power exercise is that the state rarely recognizes local practice, knowledge and rights obstructing its own efforts to decentralize forest management.

8.3 Policy implications and recommendations

China’s forest decentralization is an interesting subject for long-term observation, and linking it to forest management is a great challenge for researchers and development

practitioners. It would be risky to provide concrete recommendations based on this research. In this section, therefore, I outline several recommendations based on my highlighted research findings.

First of all, meaningful and democratic decentralization should continue to be encouraged. Although the current research has revealed some critical aspects and problems in the decentralization and reform processes, central government should not doubt the positive effectiveness of decentralization and it is vital to continue supporting and investing in it to institutionalize popular participation in decision making. In particular, as the decentralization is now well established in law, central government should invest more in its implementation and monitoring. A wide range of measures to improve the decentralization process could be employed, including institutional innovation, process improvement, capacity building and so forth, as I outline in this section.

Second, promoting democratic decentralization requires moving township government from a leading and regulatory role to one that monitors village autonomy in forest management, such as at village meetings, elections and decision making. When implementing a policy, it is important to follow the policy and regulations as well as Village Organic Law. Educating local authorities about their rights and obligations will help to foster their accountably to local governance. Moreover, to enhance the downward accountability of the local state it is necessary to improve the recent monitoring and evaluation system of officials' achievement and promotion, making responsiveness and transparency the key indicators in handling local affairs.

Central government should change its current quantitative-based approach of monitoring system to a process-monitoring system to evaluate and monitor forest policy implementation, particularly if the policy is related to local participation and village autonomy. The evaluation and monitoring team should involve different stakeholders, including the third sector and villagers.

Third, and more practically, to improve local state accountability it is important to carry

out policy trials and institutional innovation experiments to explore local institutional development, and in particular, a policy experimentation of direct election at the township level to eliminate the current appointing system for township government. A direct election system for township government will significantly promote township autonomy and scale up grassroots democratization from village level to an upper level and eventually strength their downward accountability. Such a policy pilot study will generate a great variety of experiences, lessons learned and potential for further improving local governance and the administrative structure at the local level.

Fourth, central government should ensure that meaningful power can be transferred to the village level for forest management. Several governance barriers that restrict meaningful decision making at the village level should be eliminated: 1) central government should consider eliminating the harvest quota system by setting up a village-based sustainable forest management system that enables village planning for sustainable forest use; and 2) government line agencies should respect and facilitate village decision making in forest management planning, including afforestation, management and harvest, to ensure the direct role of elected village committees in policy implementation. For this, Village Organic Law should be highlighted, recognized and enforced.

To secure local participation in decision making, government should understand and enhance local customary rights and knowledge of forest management and conservation. In particular, local institutions and traditional forest management practices should be encouraged to guarantee local participation in decisions about forest management planning, harvest and management. An amendment to Organic Law and forest policy may be required to promote recognition of local knowledge and customary rights in natural resource management.

Fifth, government should encourage NGOs, civil society organizations and other third sector entities to become involved in the whole of the policy design, implementation, and monitoring and evaluation process. Multiple-stakeholder involvement would strengthen the polycentric system and set up accountability mechanisms. The third

sector can play a useful role in bridging, facilitating and coordinating communication and dialogue between government and farmers, building a channel and forums for a flow of information, communication and feedback to enable grassroots voices to be directly heard by central and provincial government. Involved civil society organizations can also develop multiple forms of local representation.

Sixth, as for policy formulation, it is impossible to take “one-size-fits-all” approach, but an good understanding of local context and complexity is required for an effective policy. Any broader generalization or “clearly cutting” policy would be very risky given the variability of China as a huge country where economic, social and political specifications differ from place to place.

8.4 Challenges and further research

Due to limited time, resources and finance, I experienced some challenges while carrying out this research. As mentioned in Chapter 1, the scope of the research was limited to forest governance analysis at the national level; global-level governance may also affect local arenas and decentralization processes. In particular, global donors and transnational organizations such as the World Bank may have a strong influence on decentralization by setting the agenda and providing techniques and financial support (e.g. Dupar and Badenoch 2002, Litvack et al. 1998). In the Chinese context, I focused on three fields of forest governance to explore the process of decentralization, which are all national initiatives. The only attention to international influences was my analysis of the role of ICRAF in understanding the polycentric system, but I limited this to at ICRAF’s impact at the local level. Adding the global dimension to the analysis of local and national processes would strengthen understanding of the multiple scales of institutional interplay.

I have focused on forest decentralization and governance in China. Although forest, or more broadly, natural resource management, provides a critical lens through which to understand decentralization and local politics, more holistic understanding requires a comprehensive examination of local affairs overall, including local election processes,

the handling of taxation and current economic development. Such insight into the complexity and dynamics of local politics would further enhance understanding of the decentralization process. This study is an early step in my academic career to apply and explore forest decentralization linking forest governance with local politics and institutions, particularly in the Chinese context.

Apart from analysis of the political economy, another powerful analysis to measure the effectiveness of forest decentralization would involve observing its environmental outcome. Using LUCC and remote-sensing data, this research has attempted to link environmental change with institutional dynamics and governance. To generate more accurate and stronger evidence to understand the environmental outcome of the decentralization process, however, requires long-term observation and robust data support.

As a researcher from the Kunming Institute of Botany, I have been involved in research into agroforestry development in both villages for about seven years. This gave me an advantage and allowed me easily to build up mutual understanding and trust between with the villagers as well as the government officials, as well as giving me access to official data. However, it also meant that I had to take a particular stance in my study which may have limited the possibility of exploring broader issues at local regards.

Further study at each level of the political-administrative hierarchy and scale of institutions in the wider context of global governance would promote theoretical understanding of decentralization. A combination of quantitative and qualitative methods for the long-term observation and data collection would provide support for strong evidential argument of environmental decentralization study.

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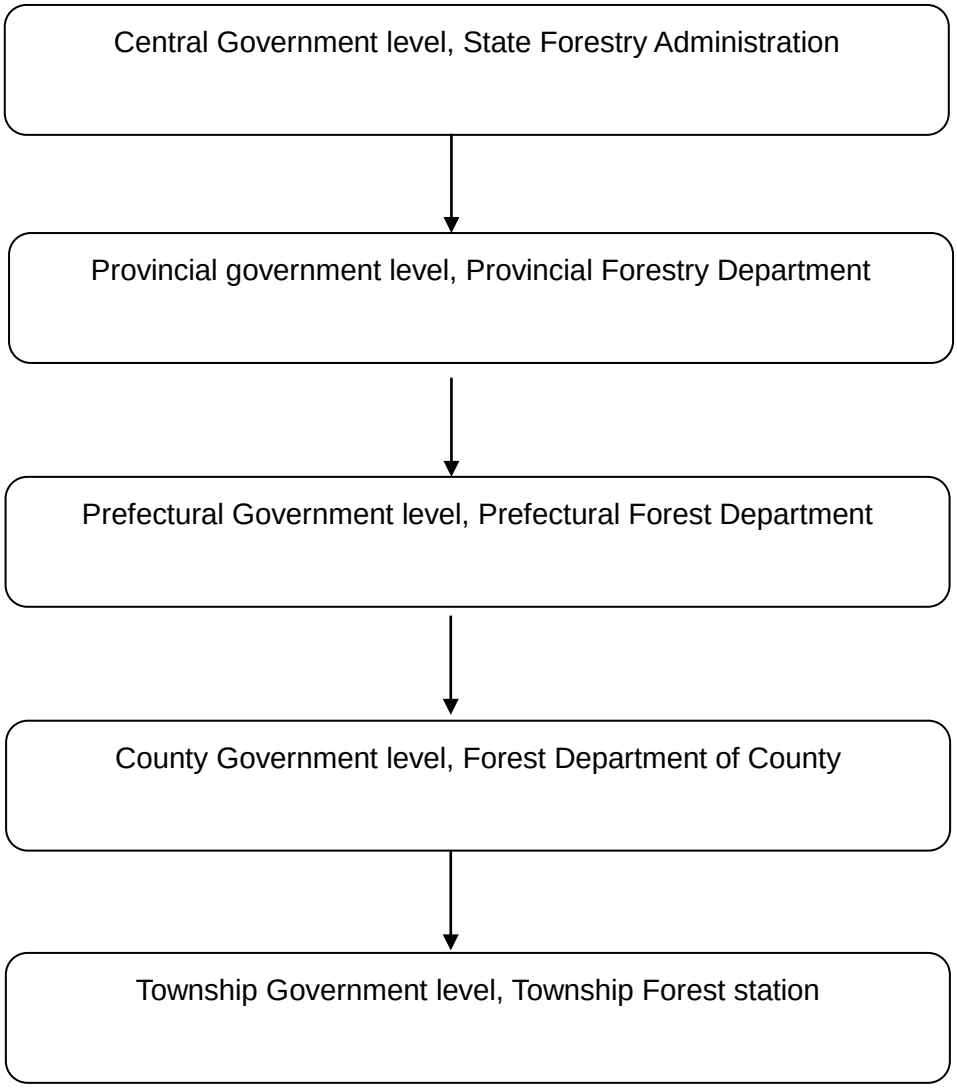
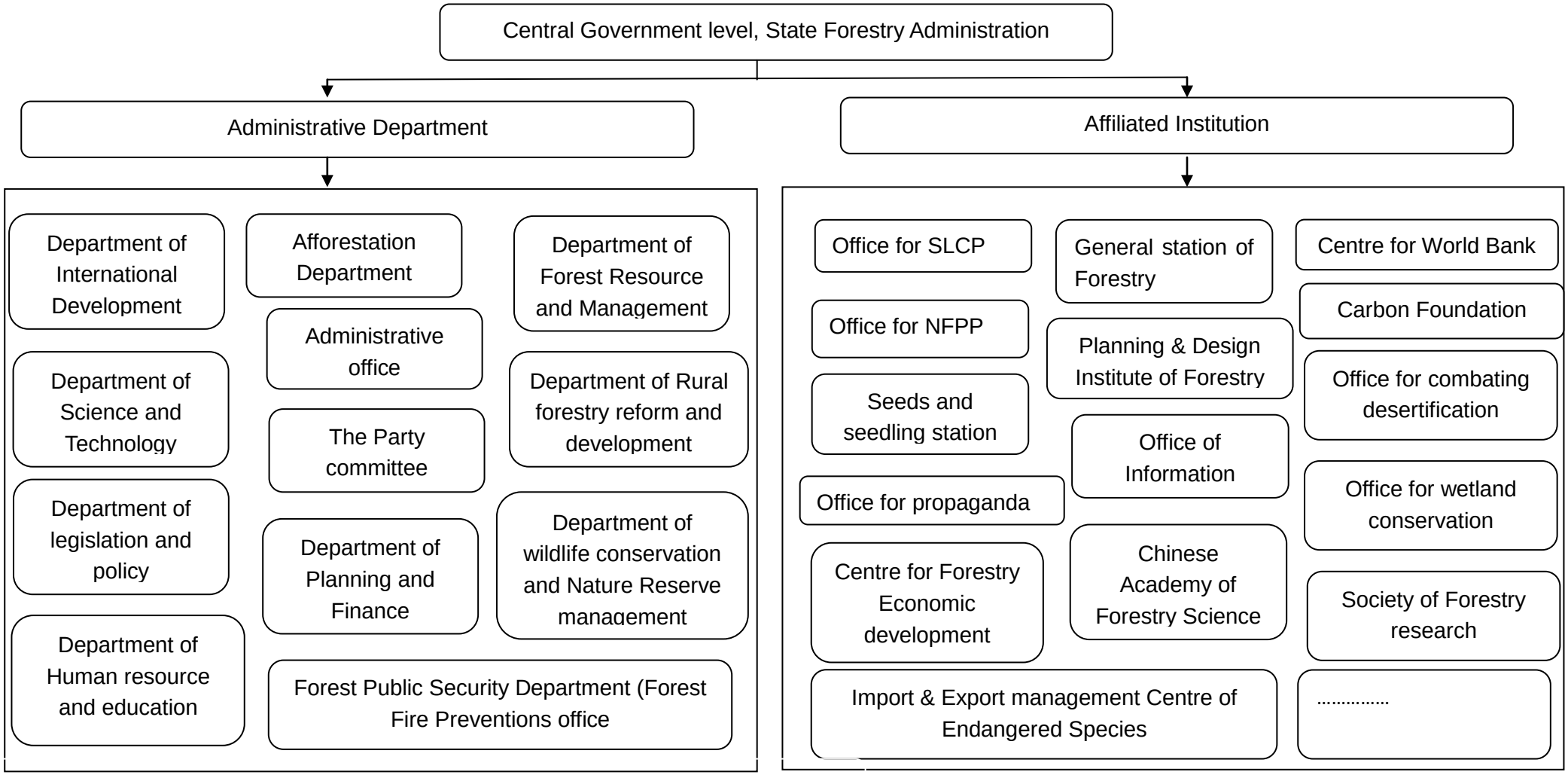
Appendix A:Forest administration system in China



Appendix B. Organizational chart of State Forestry Administration



Note: institutional setting corresponded at provincial, prefectural and county level

Appendix C. Forestry policy reform in China.

Adopted from Hyde, Xu and Belcher 2003.

Year	Title	Principal objective
1980	Introduction of vigorous Development of afforestation	Accelerates the greening of China, promotes national afforestation and greening.
1981	Decision on several issues related to forest protection and development (the Three Fix Policy)	Sets rules and policies for forest protection and development. For forestry reform: determines the ownership of mountains and forests, desingnates mountain slopes for household use, and defines a forestry responsibility system. Use rights certifications were issued for 97 million ha of mountain forests (of which 3 million ha were designated as privately managed mountains) for 57 million rural households.
1984	Decision on reform of the economic system	Shifts the priority of reforms from rural to urban and the emphasis to state-owned enterprises, market development, and price reform.
1985	The forest law of the P.R. China (China's first forest law)	Formally recognized the division of forest between the state and collectives, state general objectiv34s from forest management, established timber harvest quotas and requires shipping permits.
1985	Ten reforms to further stimulate the rural economy	Abolishes the state monopoly for timber purchase, sale and distribution in collective forest regions, and opens the markets for wood.
1987	Enhancement of forest resource management and interdiction of ruinous cutting in the southern collective forest region	Halts ruinous cutting, implements the responsibility system of government leadership at all levels in the protection and development of forest resources, resumes the state monopoly on timber purchased in southern collective forest region.
1988	The provisional regulations of state owned enterprise	Improves control over the consumption of forest resources and improves the financial operation of state-owned forests. These enterprises were requested to adhere to annual timber cutting quotas; promote

	management responsibility contracting system	reforestation; diversify management and the comprehensive sue of resources; and enhance production safety, forest protection, and fire prevention
1989	Notice of strengthening the management of logging with certificates.	Reinforces the logging quota system and the requirement that forest growth had to exceed timber harvest levels.
1995	Notice of implementing the system of using forest land with certificates	Requires certificates for all forestlands, differentiates forest land from other land use, effectively restricts conversion to other land use and ensures that this land will be regulated in accordance with forest law
1995	General outline of restructuring the forestry economic system	Pushes forest enterprises toward the market, mobilizes and enhances financial support to forestry through tax policy, strengthens infrastructure development, reduces the role of government, and reinforces administrative support for forestry
1996	Experiment on the reform of the development of classified management of forestry	Promotes the reform of classified management and operation. Classified forests according to economic (commercial), ecological (public interest of environmental goods), and mixed objectives.
1996	Decision on several issues related to deepening the reform in the state-owned forest farms.	Emphasizes tow points: 1) classified management reform must differentiate between economic and ecological forests and should be appropriate for local economic and social development conditions and 2) industry structure of forestry farm must be optimized.
1998	Amended “Forestry Law of the Peoples’ Republic of China”	Legalizes transfer rights for family plots and extends the period of user rights essentially stabilizing forest tenures in collective forests; emphasize the principal role of forestry is to provide environmental service.
1998	National Forest Protection Program	Bans logging in natural forest at the upper researches of Yangtze river and upper and middle reaches of Yellow river, reduces timber production of state-owned forest farms in the Northeast and Inner Mongolia by 19.91 million m^3, establishes 12.7 million ha of plantataions, and redirects and resettles 740,000 excess workers.

1999	Sloping Land Conversion Program (SLCP)	To reduce erosion and soil loss and promote more sustainable agriculture, central government banned the conversion of forest on slopes exceeding 25 degrees for agricultural use. Cultivated slopes must be reconverted to forest, with compensation provided by central government. Areas and households adversely affected by this policy and the logging ban now need to find alternative food and income sources such as producing higher-value cash crops with processing them to add value.
2004	Implementing compensation for ecological Forest	In order to protect ecological forest resources and maintain ecological security, state use public fund for the Compensation for Ecological Forest. The ecological forest compensation is used pay the labor cost of full-time forest guards, to compensate state forestry organization, collective and individuals, and seedling cost of forest replantation and forest tending cost.
2008	Forest Tenure Reform	Since pilot study in 2005, central government ratified a set of national forest tenure reforms aimed at boosting productivity and raising the income of farmers in collective forest areas. Under the new legislation a household contract system was implemented in forested areas to encourage the planting of trees, inspire production initiatives and investment and promote a conservation culture. The reforms entrust rural households with responsibility for forest management and production, offering 70-year contracts that include provisions to transfer, lease and mortgage access rights to a third party.

Appendix D: Household survey questionnaires

A.00 No：_____

A.01 Interviewer	_____
A.02 Date (DD/MM/YR)	

Introduction

（interviewee should be the household head）

[READ OUT] Hello. I am a researcher come from Kunming Institution of Botany. I am here doing some survey for Sloping land Conversion Program and forest management. We are here to ask you some questions about your opinion for forest manager and changes. The information collected during our discussions will only be used for research purposes. All information will be kept strictly confidential. We will not record your name and nothing you say will be linked directly to you. The interviews will take about 40 munities of your time. Your contribution is very important. Is it OK to continue? [If no, move to next household. Please spend some time chatting a little with the household to relax them before starting the formal questions.]

A.01 Province	
A.02 District	
A.03 County	_____
A.04 Township	_____
A.05 Village committee	_____
A.06 Village group	_____

A. Household characteristics

A1. Household basic information

Number of household members	No of household members active on the farm	Ethnicity	Age of interviewer	Years of education of interviewer	Public mandate of household members (1=Y/0=N)

A2. Household assets (unit: Mu)

Total farm size			forest land				other
Farm land	paddy	leasehold	SLCP	Self owned	Joint holding	leasehold	

A3. Off-farm work information

Did any member of your household work somewhere during the past year? (1=Y, 0=N)	If any, how many members?	No. days worked in each year per person	Total annual income from that?

A4. What is the most important source of household income? (Choose one)

1=farm work 2=livestock 3=forestry income 4=off farm work 5=government subsidy 6= household task

7=others

A5. What is the average Per Capita income?

A. < 1270 RMB B.1270-2540 RMB C.2540-3810 RMB D.3810-5080 RMB E. > 5080 RMB

B. Sloping land Conversion Program

If your household was involved in SLCP, please answer the question B1.
If no, please answer the question B3.

B1. Information of SLCP plots

Plot	Size(Mu)	Time of involvement in SLCP (Year)	Distance between plot to house (meter)	Soil quality	Slope of plot	What is the reason for SLCP?		Name the planted species.		Ecological forest or economic forest?	Survival rate of tree	What did you plant before SLCP?	Productivity per mu before SLCP	Is there any intercrop plantation in this plot? (1=Y, 0=N)
Code				Code A	Code B	Code C		Code D		1=Ecological forest 2=Economic forest	%	Code E		
1														
2														
3														
4														
5														

Code A: 1. above average, 2. average, 3. below average
Code B: 1. > 25° 2.25-15°3. <15° 4.Platform
Code C: 1. not suitable for crop plantation; 2.far from the village, inconveniences; 3. Most of household already participate in SLCP 4. This is government policy, we need to follow 5. Mission from the village head and forestry bureau
Code D: 1. walnut; 2.pear; 3.fire ;4.Taiwai fire ; 5. Chinese chestnut; 6=Pinus armandi; 7= pinus kesiya ; 8=Pinus yunnanensis ;9= alder; 10=citrus; 11=persimmon; 12=other
Code E: 0=barren land; 1=maize; 2=wheat; 3=barley; 4=rice; 5= potato; 6=buckwheat; 7=beans; 8=sugarcane; 9=tobacco; 10=tea; 11=medicinal plant; 12=other

B2. Sloping land conversion program

1. Whether you were willing to participate in the SLCP?	0=N；1=Y；
2. Can you participate in SLCP freely or not?	0=N；1=Y；
3. Can you decide plant species to be planted by yourself?	0 =N；1=Y；
4. Do you have right of choosing plot for SLCP?	0 =N；1=Y；
5. Do you have right of deciding area of plot to be converted into SLCP?	0 =N；1=Y；
6. Who decide the area of plot to be converted into SLCP?	1=Forestry Bureau，2=Township government，3=Head of village committee，4=Head of villager group，5= farmer
7. Who decides the plot for SLCP?	1=Forestry Bureau，2=Township government，3=Head of villag committee，4=Head of villager group，5= farmer
8. Who select the tree species to be plated?	1=Forestry Bureau，2=Township government，3=Head of villag committee，4=Head of villager group，5= farmer
9. Did you participate in SLCP zone distribution?	0 =N；1=Y；
10. Did you participate in the land measurement?	0 =N；1=Y；
11. Did any officer from government consult you before SLCP?	0=N；1=Y；
12. Did you participate in Implementing planning? (eg..SLCP plot choosing, Tree species selection, season for plantation)	0 =N，1=Y；
14. Did you get any training for tree species management after SLCP?	0=Never；1=Y, I had participated；2=I know, there is training but I did not participate.
15. Who take cares the trees in your SLCP plot?	0=No body，1=One self，2= Village group，3= Village community，4= Forestry Bureau
16. After the government has stop the subsidy, do you want to return back to previous situation?	0=N，1=Y
If yes, why?	1= government stops the subsidy，2= Less income 3= Food shortage 4=Others：_____
If no, why?	1=not allowed，2= good income，3=People prefer for off farm work，4= More production form Intercrop planting，5= Others_____
17. Did you get any income from planted trees?	0=N；1=Y；
18. Did you get any other income from SLCP? (ex. inter crop plantation, Medicinal plant, mushroom and other Non timber forest products).	0=N；1=Y；
19. Do you have the forest tenure certificate?	0=N；1=Y；

20. Are you satisfied with the government subsidy for SLCP?	1= Very less，2= less，3=reasonable，4=Higher，5=very high
21. Do you think that government has given subsidy for enough time?	1=Too short，2=short，3= reasonable，4=enough，5= too enough
22. Are you satisfied with the SLCP zone selection?	0=N；1=Y；
23. Are you satisfied with the tree species selection?	0=N；1=Y；
24. Do you think the SLCP is successful or not?	0=N；1=Y If “unsuccessful”, please write down the reason:_____

B3. Non-SLCP participants

1. Do you hear about the SLCP?	1=Y，2=N，（if ”No”, please answer part C directly）
2. Is there any household, who participated in SLCP in your village?	0=N；1 =Y；
3. Have you ever heard that you can also participate in SLCP?	0=N； 1= Y；
4. If you like, you can participate or not?	0=No, I cannot. 1 = Yes I can；
5. If you can, Why don’t you participate in SLCP? (Please choose any three of below)	1. crops can make money 2. not enough subsidy 3.subsidy period is too short 4. Difficult for implementation (Please list the difficulties) 5 .lack of suitable plot 6. lack of farm land 7.I had already leased my farm land to other 8.I do not trust the government 9 .Other_____
6. Why don’t you participate in SLCP? (Please choose any three of below)	1. I have no farm land. 2. We have less income in my family. 3. My farm land is not belong to SLCP 4. I had already leased my farm land to other 5. I was not informed. 6 .Others:_____
7. If you are permitted to participate in this program, do you like to participate?	0=N；1 =Y
8. In your perception, what kind of impact on crops may be there if trees are planted around the farm land?	1. Positive impact 2. No impact 3. Negative impact
9. Do you think the SLCP is successful or not?	0=N；1=Y，(If no,why? _____）

C. Forest Tenure Reform

C1. Forest resource

Total forest area before forest tenure reform (excluding SLCP plots)	**Actual working forest area before FTR (excluding SLCP plots)**	**Total forest area after forest tenure reform (excluding SLCP plots)**	**Actual working forest area after FTR (excluding SLCP plots)**

main tree species in the forest	**age of the tree (year)**	**How far is the forest plot from your house?**
		1. < 2Km； 2. 2-5Km； 3. 5-10Km； 4. >10Km，

C2. Information of Forest Tenure Reform

1. Have you ever attended in the meeting of FTR before?	0=N；1=Y；
2. Did you or your family have participated in village group discussion on Forest tenure reform agenda?	0=N；1=Y；
3.Did you or your family have participated in village committee discussion on Forest tenure reform agenda?	0=N；1=Y；
3. Who make the decision on FRT in the village group level?	1=county government，2=township government，3=head of village，4=village group leader， 5= village councils
4. Who make the decision on FRT in the village committee level?	1=county government，2=township government，3=head of village，4=village group leader， 5= village councils
6. After FTR, do you have right to convert forest area into crop land?	0=No, or I have no idea 1=Yes, but need to get permission from both Forest department and Village Committee， 2=Yes, but need to get permission from Forest department， 3=Yes, but need to get permission from Village Committee， 4=Yes, I can and I do not need to get permission
7. After FTR, do you have right to convert the forest type?	0=I have no idea 1=Yes, but need to get permission from both Forest department and Village Committee， 2=Yes, but need to get permission from Forest department， 3=Yes, but need to get permission from Village Committee， 4=Yes, I can and I do not need to get permission
8. After FTR, Do you have right to choose tree species for plantation?	0=I have no idea 1=Yes, but need to get permission from both Forest department and Village Committee，

	2=Yes, but need to get permission from Forest department， 3=Yes, but need to get permission from Village Committee， 4=Yes, I can and I do not need to get permission
9. After FTR, Do you have right to decide the number of trees to be cut down?	0=I have no idea 1=Yes, but need to get permission from both Forest department and Village Committee， 2=Yes, but need to get permission from Forest department， 3=Yes, but need to get permission from Village Committee， 4=Yes, I can and I do not need to get permission
10. After FTR, do you have right for planting intercrops in your forest area? (ex. herbal medicinal Plants)	0=I have no idea 1=Yes, but need to get permission from both Forest department and Village Committee， 2=Yes, but need to get permission from Forest department， 3=Yes, but need to get permission from Village Committee， 4=Yes, I can and I do not need to get permission
11. After FTR, do you have right for managing the NTFP in your forest area? (ex. Mushroom harvesting, wild vegetable, wild herbal medicine)	0=I have no idea 1=Yes, but need to get permission from both Forest department and Village Committee， 2=Yes, but need to get permission from Forest department， 3=Yes, but need to get permission from Village Committee， 4=Yes, I can and I do not need to get permission
12. After FTR, can you sell your forest to other local inhabitant, if you want?	0=I have no idea 1=Yes, but need to get permission from both Forest department and Village Committee， 2=Yes, but need to get permission from Forest department， 3=Yes, but need to get permission from Village Committee， 4=Yes, I can and I do not need to get permission
13. After FTR, can you sell your forest to other non local inhabitant?	0=I have no idea 1=Yes, but need to get permission from both Forest department and Village Committee， 2=Yes, but need to get permission from Forest department， 3=Yes, but need to get permission from Village Committee， 4=Yes, I can and I do not need to get permission
14. After FTR, can you make deposit your forest area for getting loan?	0=I have no idea 1=Yes, but need to get permission from both Forest department and Village Committee， 2=Yes, but need to get permission from Forest department， 3=Yes, but need to get permission from Village Committee， 4=Yes, I can and I do not need to get permission
15. After FTR, how long can you own your forest land in the future?	1=forever； 2. < 30years； 3. 30－50years； 4=50－70years；5. >70； 6. Have no idea。
17. Do you know, who has right to decide the forest distribution? (choose one)	1=village councils；2=village group leader；3=head of village committee；4=township government；5=county government； 8=Others_____
18. If you have any kind of dispute on forest, to whom you want to solve the matter?	1=other villager (ex. Older person)； 2=village group leader 3= head of village committee；4= township government； 5=county government； 6=court； 7. others _____。

19. What are the changes you find in your forest after FTR?	1. No changes 2. I have cut down the trees and sold it. 3. Sold it 4.sold it by Forest Ownership Exchange Center 5. Deposit forest for loan 6. Expansion of forest area than before 7. fruit tree plantation 8. Timber production 9. NTFP production
20. Is FTR good for you or not?	0=N；1=Y；
If not why? (please chose any two)	1. I have no idea 2. All the tree to be cut down 3. Uneven distribution 4. Difficult for getting permission for cutting down tree 5. Cannot cut down tree without permission 6. Too much ecological forest and less subsidy 7. Too small forest area for managing 8. other_____
21. Have you got the forest certification?	0=N；1=Y，
If NO, Why?	1.I have no idea；2=holded by village committee；3=there is still some disputes；4=didn't finish yet；5=other_____
22. What are the main objectives of FTR? (please chose any three)	1. No idea； 2. Uniform distribution of forest to each HHs 3. For getting forest certification, 4. 70 years ownership of forest, 5. Selling or for getting loan from bank； 6. In order to solve forest dispute； 7. Benefit to farmers; 8.other____
23. Do you have any comment on current forest policy?	1. No idea； 2. Remove the rule of getting permission application for cutting trees ； 3. Increases the subsidy from ecological forest；4. Provide training 5. Strengthen management；6. other_____
24. Is there still any collective forest in your village?	0=N，1=Y
If yes, did you sign the shareholding contract?	1=have no idea；2=not yet；3=Yes.
25 have you gotten shareholding certificate?	0=N，1=Y
26. Is there any tree to be cut down from collective forest?	1. Have no idea； 2. not yet；3. Yes
If yes, do you get share from that?	1.No，2. No, all the benefit used for infrastructure construction, 3.Yes.
27. Have you ever participated in discussion for utilizing the benefit from the collective forest?	0=N，1=Y

28. Is there any collective forest that was sold?	1. No idea； 2. never； 3. Yes
29. If yes, did you participate for discussion on selling the collective forest?	0. N，1.Y
If no, why?	0. Because no one inform me about that. 1. I was not in village at that time ； 2. Head of village had already make decision； 3. Decided by township government； 4. Decided by county government
30. Did you get any benefit from that?	1.No，2. No, all the benefit used for infrastructure construction, 3.Yes.
31. Do you participate in discussion on utilizing the benefits from the selling of collective forest?	0=N，1=Y
32. Who manage your forest after forest tenure reform?	1=nobody，2=myself，3=joint operation，4=village committee，5=forestry department

D. Forest Management

1. Do you use fuel wood?	0=N，1=Y，
If yes, how much fuel wood you need per year?	_____排
2. From where you collect the fuel wood? (chose one)	1= our village's collective forest 2=owned forest 3=other's forest 4=other's collective forest 5=purchase (expense in each year?_____)
2. Have you cut down the trees in past 7 years for building the house?	0=N，1=Y
If yes, form where? (multiple-choice, maximal 2 answers)	1=owned forest 2=purchase from other farm's forest 3=purchase from collective forest 4= Purchase from other forest
4. From where you get permission to cut down trees for building?	1= I did not apply for permission 2.= Village committee 3.= Forestry Department in Township 4. = Forestry Bureau
Who went for applying permission?	1.= Myself 2.= Village committee helps for applying 3.= Head of village 4.= Relatives and friends
5. Have you cut down the trees in past 7 years for selling?	0=N，1=Y
If yes, from where?	1. owned forest 2. Purchase from other farm's forest 3. purchase from collective forest 4. Purchase from other village
How much you earn from selling the wood in past 7 years?	_____ (RMB)
6. From where you get permission to cut down trees for selling?	1. I did not apply for permission 2. Village committee 3. Forestry Department in Township 4. Forestry Bureau
Who went for applying permission?	1. myself 2. Village committee helps for applying 3. Head of village 4. Relatives and friends
7. What kind of difficulties did you face during applying the permission? (multiple-choice, maximal 2 answers)	1.Too complex for applying 2.Since I am not familiar with the authority, it was difficult for me to apply

	3.It is expensive 4.Too far and not convenient 5. Village Committee did not permit 6.Difficult to apply
8.who do you think allocate the harvest quota？（single choosing）	1. village group 2. village committee 3. township government 4. forest bureau 5. The forestry department of Yunnan province 6. State forestry administration
9.Have you or your family member help other to cut down the trees in past 7 years	0=N，1=Y
If yes, how much money do you earn per year?	_____Day/RMB，　　Total：_____RMB
10. Have you planned for planting more trees?	0=N，1=Y
If yes, what kind of species will plant? (multiple-choice, maximal 3 answers)	1=walnut; 2=pear; 3= fire 4=Taiwai fire 7=Chinese chestnut 8=pinus armandi 9=pinus kesiya 10=pinus yunnanensis 11=alder 12=citrus 13=persimmon，14=other（_____）
11. What are the factors that affect the enthusiasm of farmers to plant trees? (multiple-choice, maximal 2 answers)	1= Lack of active member 2= seedling is not easily available 3. lack of enough land 4.too much time for waiting get benefits 5. It is not certain that whether I can cut down tree after long time. 6. difficult to get permission to cut down trees 7.Not good marketing 8.I doubt that government will change its policy on it.

Thank you very much!