

RESEARCH ARTICLE

Private vs. Community Management Responses to De-Collectivization: Illustrative Cases from China

Jinlong Liu¹, Jiayun Dong², Hexing Long³, Tuoyuan Xu¹ and Louis Putzel⁴¹ School of Agricultural Economics and Rural Development, Renmin University of China, Beijing, CN² Economics School, Fujian Agriculture and Forestry University, Fuzhou, CN³ School of Economics, Minzu University of China, Beijing, CN⁴ Center for International Forestry Research (CIFOR), Bogor, IDCorresponding author: Louis Putzel (l.putzel@cgiar.org)

Over the last several decades, China has undergone several distinct episodes of collectivization and de-collectivization of forest property rights. China's latest round of collective forest property reforms, launched in 2003, have promoted individual land holding and management, reviving the longstanding debate on whether privatization would improve profits, rural welfare, and forest management. To uncover reasons for different institutional choices in response to land reform and their effects on forest management, we present two cases, from villages in Guizhou and Yunnan provinces. At the local level, these concepts are confronted by diverse groups of actors and management systems with complex arrangements concerning property and forest use rights. As reforms unfold, they are implemented to differing extents and in various manners, reflecting unique socio-ecological and historical contexts, social relations, community dynamics, and global economic trends. Key factors affecting outcomes were prior traditions, social cohesion, and market incentives to manage resources. In the Guizhou case, with a history of private ownership by people of different social groups and a reliance on restricted timber resources, reforms resulted in a fragmented forest management system. In the Yunnan case, a tradition of collective forest management by a tight-knit social group and access to a lucrative non-timber product resulted in a new and effective collective management system. These findings are important to inform policies on forest property in China and beyond as they call into question a link between privatization and marketization favoring effective resource management.

Keywords: collective forest tenure reform; community management; governance; decentralization; top-down and bottom-up decision making

1. Introduction

Since the 1980s, the decentralization of power and legal authority over land and resources from central governments to sub-national levels of society (e.g., provincial or municipal governments, indigenous groups, and community organizations) has been a common theme in academic forest policy and management literature (Ribot, Agrawal, and Larson, 2006; Tacconi, 2007; Liu and Innes, 2015). De-collectivization, devolution, delegation, deregulation, privatization, and denationalization are just a few examples of the diversity of decentralization processes (Agrawal and Ostrom, 1999; Ribot, 2002) that have unfolded as central governments have reassigned powers and responsibilities to lower or peripheral levels of government, or from government to other actors, including peasants and private investors. National and global institutions have promoted decentralization of responsibility for forest management to local land and resource managers with the expectation that it would improve local autonomy via stakeholder involvement in decision making (Ostrom and Nagendra, 2006; Agrawal and Ribot, 1999), strengthen forest tenure security, alleviate poverty in forest communities, and ultimately support more sustainable forest management (Banana, 2000; Colfer et al., 2008; Ferguson, 2005).

Of course, processes influencing courses of decentralization and subsequent outcomes are highly diverse, context specific, and reflective of regional histories (Agrawal and Ostrom, 1999; Edmunds and Wollenberg, 2003; Larson, 2005; Ribot et al., 2006; Colfer et al., 2008). The courses of decentralization are varied and include actions to transfer administrative or law enforcement power to lower-level agencies, as well as property rights reforms such as privatization. When it comes to governance of natural resources such as forests, the intentions of policies and their outcomes often diverge (Clement, 2010), and the actual behaviors of farmers and communities towards changing institutions are conditioned by prior histories of land tenure (e.g. Solarzano and Fleischman, 2018). In this paper, we seek to understand why, in China, choices among institutional arrangements affecting forest management differ significantly from place to place, and how those outcomes may result in more or less effective forest management.

In China, forest property rights reforms have been at the center of decentralization debates, with the economic argument being made that clarifying, individualizing, and extending the duration of property rights – and even privatization – can enhance economic development and improve the efficiency of resource use. The benefits of privatization, in particular in China, have long stirred controversy, for a number of reasons including potential negative impacts on rural income security and inefficiencies of requisite national institutions to administer credit and register land rights (Dong, 1996; Rozelle et al., 2005). More generally, Larson (2011) has argued that property rights reforms have faced serious challenges in increasing local autonomy and property rights security. These challenges have included the execution of processes for implementing rights-based management systems, the continued monitoring and protection of rights from competing claims, and the construction of institutions needed to ensure the equitable distribution of benefits for community ownership and to institute dispute resolution processes. Indeed, while the distribution of power and authority to local governments, communities, and households is the mainstay of forest governance decentralization (Agrawal and Gibson, 1999), a number of such efforts have failed for reasons that include policy design flaws (Ribot et al., 2006), limited delegation of functions to lower levels of bureaucracy, poor accountability (Edmunds and Wollenberg, 2003), elite capture of benefits (Maryudi et al., 2012), fragmentation of forest land, ignoring local culture and customary regulations (Zhang, et al., 2019), and inadequate public consultation (Liu and Zhao, 2009). Qin et al. (2011) posit that policy makers largely ignored the needs of locals in tenure reforms. Sikor et al. (2017) lament the exclusion of local farmers from higher-level planning and implementation of major programs targeting forest resources: governance remains centralized as the state retains control and authoritative rights, while farmers remain “simple beneficiaries of indirect benefits.” Such shortcomings jeopardize the livelihoods of poor and vulnerable groups, whose property rights are subject to conflict and the vagaries of entrenched power arrangements in place at the ground level, persisting as artifacts of historical events and processes (Liu, 2006; Hall et al., 2011; Peluso et al., 2012; Kelly and Peluso, 2015; Putzel et al., 2015). On the other hand, as shown through cases presented by Janssen (2011) in this journal, “a healthy social fabric” characterized by trust and minimal inequality can increase community resilience in the face of exogenous change, enabling them to make beneficial collective choices. This may include, as governance arrangements shift at different scales, local actors engaging or activating institutions they consider to be aligned with their interests in order to assert their own property rights (Meinzen-Dick and Pradhan, 2002, in Ratner et al., 2013).

Land in China is either state- or collectively-owned. From central to local levels, the government shares administrative responsibility. While administrative authority over land use in China ultimately resides with central state officials from the county level and above, the ownership of local land by village collectives provides village-level officials a great deal of influence (Mattingly, 2016). Top-down decentralization plans can encounter push-back from robust village leadership representing collective interests, supported by the national Law of Village Autonomy (Cui, 2002), which can mitigate pitfalls of policy design and adjust to local historic, institutional and biophysical conditions. On the other hand, local forest governance may be fragmented by decentralization policies that shift rights and responsibilities among groups at various political scales, leaving gaps in management and rule enforcement (see, e.g. Putzel et al., 2019).

According to official reports released by the former State Forestry Administration (see, e.g. SFA, 2014), and a number of articles by Chinese scholars, the new round of CFTR has achieved great success on several fronts, including the transfer of rights over 97% of collective forests to individuals or group of individuals, improved rural welfare, increased profits from forest management, and improved rural governance (Xu, et. al, 2008; Yan and Chen, 2010; Yi, et. al, 2014; Zhang and Xu, 2009). However, the outcomes of forest decentralization are diverse, due to a number of factors, including configurations of previously existing (legal, customary, and *de facto*) rights (Larson and Soto, 2008); persistent prior political, social, and economic structures in the face of insufficiently transformative governance to support decentralization processes (Hickey & Mohan, 2005); and the infinite complexity of communities. With a wealth of experience in China on the new round

of CFTR, the authors questioned the presumed outcomes of reform. Based on long-term field investigations in two communities in southwest China, this paper seeks to answer the following questions: 1) what are the reasons for diverse institutional choices affecting management and use rights in response to forest tenure reforms in different communities? And 2) how are the different reactions to reforms reflected in the efficacy of actual forest management? The results of this study contribute to debates on the relationships among collective property rights vs. privatization, marketization, and effective resources management. Insofar as the results of policies affecting these relationships also affect the ecological health of forests and local community wellbeing, a better understanding of real-world outcomes, such as that the authors intend to provide, is needed.

2. De-collectivization of forests in China

Reform of China's rural land and forest ownership is as critical today as it has been for decades, as it affects income distribution and has the potential to promote a more equitable economic system at the very broad national scale (Lie, 2014). Although land itself remains the inalienable property of the collective, reform has involved experimentation with devolution of various forest property rights to individual households (Liu and Zhao, 2009).

In 1981, the central government initiated the Household Responsibility System, which consisted of allocating use rights over collectively-owned farmland to individual households. Agricultural production surged and encouraged a rapid expansion of the program throughout the country (McMillan et al., 1989; Lin et al., 1992; Ma et al., 2015). In 1983, the government initiated a similar program of collective forestland distribution called the "Three Fixes Policy"¹ (Liu, 2009). The Three Fixes Policy, implemented by the former Ministry of Forestry,² resulted in a massive semi-privatization, or an assignment of forests and use rights over 70% of collective forest holdings to individual households. (Lu et al., 2002). Each household received forest rights certificates (*linquanzheng* in Chinese), valid for a maximum of 15 years, extended to 70 years in 1992 (Liu and Zhao, 2009).

In the mid-1980s, when forest property rights were tending towards privatization, severe timber overharvesting occurred, attributed by some to policy-induced tenure insecurity (e.g., Yan and Chen, 2010). It is also likely that accelerated tree cutting resulted from the exploding demand for timber arising from a construction boom associated with liberalizing economic development (Li et al., 1988). To officially address unsustainable exploitation, harvest quotas, timber checking stations, and a forest police service were established (Liu, 2009).

Established forest land rights were frequently ignored. In the early 1990s, the policy of "who plants, owns" (*shui zao, shui you*)³ was re-established across the collective forest regions and extended beyond communities to the private sector to encourage investment in afforestation of collective land. In the late 1990s, the majority of degraded and underutilized collective lands without forests (i.e. barren slopes/mountain sides, barren riversides, and unused flat land), which had been legally allocated to households, were acquired by private and community interests through local auctions. The policy change impacted the rights of local people to manage forests and lands allocated to them through the Three Fixes. It also affected property inheritance and engendered a new sense of insecurity in forest ownership and land tenure. Relatively poor households in communities and rural populations in impoverished areas had lost forests and forest land use rights, but still held forest rights certificates, which created social tension and inequity.

In 2003, China implemented a new nationwide Collective Forest Property Rights Reform (CFPR), with the goal of improving forest management, stakeholder participation, community governance, and the livelihoods of forest-dependent people (Jiang, 2006). The goal of the reform was to allocate no less than 95% of collective forestlands in total to individual households in each administrative village.⁴ Forestry authorities issued new forest rights certificates to every household, granting owners of forests rights to mortgage, inherit, and "sell" forestland legally. Land⁵ ownership remained vested in the collective and was inalienable; however, forest use rights were considered transferable, within the constraints of the contract period (Liu

¹ Fixing ownership of forests, fixing forest management roles, and fixing the household responsibility system for forest management.

² Renamed the State Forestry Administration (SFA) in 1998 and the State Forestry and Grassland Administration in 2018.

³ This policy "who plant, owns" was enacted in 1961 after severe starvation from "the Commune Movement" started in 1958, said: forests or trees planted by household in self-sufficient land and residential area of this household, and land agreed by the Commune this household is in, can be owned by this household.

⁴ The administrative village is the second smallest political land unit in China. The smallest, the natural village, is, as the name suggests, a small physical grouping of houses. For a more thorough explanation of this terminology, see, e.g., Zhu and Jiang, 1993.

⁵ According to the Laws of Forestry and Agriculture, forestland use is limited to forestry and farm land used for farming. Changes in land use are strictly regulated.

and Zhao, 2009). In October 2008, the State Forestry Administration began implementing supplemental policy measures including providing subsidies for forest insurance, favor loan to forest management and underplanting, and enhancing transparency and fair administrative processes to enhance forest management and improve productivity. Provincial and county forest authorities also acquired greater authority over forest management planning, timber extraction, processing, and market oversight (Liu and Zhao, 2009).

According to a government report, by 2017, 101 million forest rights certificates, representing 175 million ha of forests and 4.6 billion m³ of timber stocks had been issued to more than 100 million rural households, contributing to better forest governance and poverty alleviation (SFGA 2017). A growing body of literature enumerates the successes of China's forest reforms and examines which specific rights to forest and forestland have (or have not) devolved to individual householders (Yi et al., 2015; Tu et al., 2016). Some believe that evidence of farmers' preference for longer-term forest tenure (of 70 years) demonstrates support for privatization as a source of greater income security (Qin et al., 2011). In approximately 100 counties within the collective forest region that the first author has visited since 2008, support for privatization is less clear cut. This paper presents two carefully selected case studies in southwest China which have served as pilot cases for the demonstration of CFPR. Results challenge the assumption that centralized approaches promoting forest decentralization have worked effectively and that de-collectivization to promote privatization of forests necessarily works better for rural livelihoods and forest management in China.

3. Methodology

3.1. Case Study Approach

This research is based on case studies of CFPR in two administrative villages, the basic unit in rural China at which property rights studies can be conducted (Wong, 2015). Caiyuan Village, in Jinping County, Guizhou Province, was selected because of the large amount of privately held forest land there prior to 1949. Miheimen Village, located in Nanhua County, Yunnan Province, was selected because of its historic practices of shifting cultivation, in which forests and forestland were treated as common-pool resources. These two cases exemplify many communities in China: both are rich in forest resources but poor in arable land (**Table 1**), both have recognized forest property rights security issues, and in both, approximately 25% of forest is under collective management. Both communities were selected in 2006 by county forestry authorities as pilot communities for implementing CFPR. In addition, both villages have since 2006 been study sites of Renmin University's Centre of Forestry, Environmental and Resources Policy Studies. Prior research in these communities has focused on understanding social change resulting from resource-based policies and programs. The villages feature different ethnic compositions: Caiyuan Village is mainly inhabited by Dong and Miao people; Miheimen Village mainly by one group, the Yi.

3.2. Caiyuan Village, Jinping County, Guizhou Province

Forestry was an important industry in Jinping County during the Qing Dynasty, between 1644 and 1912, because of a thriving commercial trade in plantation-grown Chinese fir (*Cunninghamia lanceolata* (Lamb.) Hook.). Local accounts indicate that trade in timber harvested from private lands probably dates back even earlier, to the late Ming Dynasty, during the period of approximately 1573 to 1620 (Jinping County, 1995). From Jinping, timbers were shipped out via the Yangtze River through the Dongting Lake connection, reaching as far as Beijing via the Beijing–Hangzhou Grand Canal, where it was used in the construction of Beijing's Royal Palace (Huang and Lan, 1998). This trade declined in the mid-1800s due to reduced demand associated with economic depression and wars. Nonetheless, many farmers in the region have retained their knowledge of Chinese fir plantation management.

Caiyuan Village has long been inhabited by the Miao and Dong ethnic minorities: Miao people are known to have inhabited the region for approximately 1000 years, while the Dong people arrived approximately 400 years ago. Caiyuan Village is situated along both sides of the Qingshui River, a tributary of the Yangtze. For more than 400 years, local livelihoods depended on timber sales. Before 1998, more than 70% of

Table 1: Population and land use statistics in study sites.

Name of villages	Number of households	Population (persons)	Nationality	Area of Household Forests (ha)	Area of Collective Forests (ha)	Area of Arable land (ha)
Caiyuan	278	1378	Dong, Miao	868	239	107
Miheimen	357	1624	Yi	1858	579	89

Source: field survey, 2012.

cash income was derived from timber. After a logging ban in 1999, income from timber sales dropped significantly, to a mere 2–3%. Because of the scarcity of arable land, agricultural production is limited to the cultivation of rice and vegetables, primarily for subsistence household use and limited trade. Livelihoods have changed substantially since 1998, given that China has been in rapid development for the past three decades. In 2014, the average annual individual income was 3700 yuan; this was approximately one half of the national average for rural farmers, which was primarily derived from off-farm labor (65%), farming (15%), small businesses (i.e., groceries, mechanics' shops) (~15%), and other activities, including forestry (5%). Forest cover was approximately 90% in 2014, according to the County Forestry Bureau, and 95% of forests were plantations dominated by Chinese fir. The remaining 5% was secondary mixed stands of Masson's pine (*Pinus massoniana*) and various broadleaf species.

3.3. Miheimen Village, Nanhua County, Yunnan Province

Miheimen Village in Nanhua County is located in the mountainous hinterland of the western part of Yunnan province. The Yi (or Lolo) people—one of China's largest ethnic minorities—have resided in the mountainous part of Nanhua County for approximately 200 years and in the wider Nanhua County for more than 500 years (Nanhua County, 2006). Prior to 2001, the village was isolated, as a result of its being located nearly 5 h by foot from the nearest town, Wujie. Road construction in 2001 facilitated connection to major highways, allowing transportation by motor vehicles and significantly enhancing the trade of goods. Improved market access resulted in the development of a market for non-timber forest products, such as Chinese herbs and mushrooms, on which the majority of the Yi people's livelihoods now depend. Nanhua County is famous for its wild fungi, more than 200 species of which grow in the region, matsutake mushrooms being the most popular (Nanhua County, 2006).

The village has a long history of meeting dietary needs through shifting cultivation of corn, buckwheat, wheat, and potatoes, raising domestic livestock (dogs, pigs, and sheep) and hunting wild game, such as deer. However, as the human population increased, permanent settlement via land claiming and property demarcations became a necessity, resulting in the abandonment of shifting cultivation practices in the early 1990s. Farmers established permanent settlements, featuring extremely small holdings of about one hectare per family. Between 1980 and 1995, tobacco became a major cash crop, causing a decline in forest cover as a result of the demand for wood for fuel used in the drying process. After 1995, to mitigate erosion and drinking water contamination associated with deforestation, the number of permits issued to grow tobacco was reduced, and production declined. Most farmers turned to cultivating potatoes, radishes, walnuts, and collecting wild mushrooms, because of easy access to market for these products, while relying on domesticated animals (pigs, goats, and chickens) as sources of protein.

3.4. Data Methods

Research was conducted from 2004 to 2017 in Caiyuan Village and from 2007 to 2017 in Miheimen Village. The first visit of approximately 10 days was made by a multidisciplinary team with expertise in forest management, economics, and sociology, to collect data at household and community levels. According to the sustainable livelihoods framework developed by the UK Department of Foreign and International Development (DFID), five assets—natural, social, human, physical, and financial capital—affect people's livelihoods and the relationships between them (DFID, 1999), and data from a random sample of 10% of the households in these two villages was collected accordingly. At the community level, data related to changes in demography, natural resources, social organization, and customary regulations were collected, as well as details of historic events and government interventions.

Subsequently, both villages were visited every other year, for up to a week during each visit. Caiyuan Village was visited in 2004, 2006, 2008, 2010, 2012, and 2015, and Miheimen Village was visited in 2007, 2009, 2011, 2013, and 2015. During each visit, data related to forest management, implementation of governmental forest policy interventions (particularly in regard to forestland tenure), and household livelihood activities were collected using semi-structured key informant interviews and focus group discussions. The key informants included all village political and religious leaders, selected elders, elite members, government representatives, and heads of both shareholding tree farms (*gufeng linchang*) and village collective tree farms (*jiti linchang*). The key informants were initially selected on the basis of information from forest officials from The Jinping County Forestry Bureau for Caiyuan village, the Nanhua County Forestry Bureau for Miheimen village and official village heads. Over time, we enhanced our selection of key informants through repeated encounters and long-term relationships with villagers. We sought key informants with expertise on historical events, local politics, forest management, cultural activities, and traditional ecological knowledge. To date, a couple

of officials and technicians from the Nanhua and Jinping county governments and line agencies have been interviewed, and approximately ten key informants have been interviewed in each village.

Focus groups, typically composed of seven men and three women, were organized during the first visit to create village land-use and forest management maps, as well as to gather historical transformation on land use and forest management. Focus groups were also organized for the end of each visit, in which findings were shared, crosschecked, and revised in accordance with group consensus. This intensive interviewing, observations and focus group meeting together with repeated field investigations, has been the basis for the reliability and validity of this research.

3.5. Analytical Frameworks

Based on the conceptual framework of the bundle of rights suggested by Schlager and Ostrom (1992), **Table 2** proposes, as an analytical framework, an adapted bundle of forest rights afforded to different users.⁶ This framework provides the extended concept of property rights: the human-defined rules that permit or forbid actions with respect to a particular resource, which do not refer just to land tenure, private property rights, or decentralization (Coleman and Liebertz, 2014). A user with rights of access only is defined as a traditional user, and one with all four rights is defined as an owner (see **Table 2**).

We employ, as well, a simplified version (**Figure 1**) of Ostrom's Institutional Analysis and Development (IAD) Framework (Ostrom, 2005, McGinnis, 2011), as a tool to identify and discuss differences between the two cases, in terms of the exogenous variables that affect villages responses to policy change (actions), in terms of interactions between villages and policies, and the criteria through which we assess ultimate outcomes.

Table 2: Specific rights within the “bundle of rights” associated with different forest users. In this adapted framework, alienation pertains to the ability of the owner to transfer or “sell” contracted forest use rights.

Rights	Owner	Proprietor	Authorized user	Traditional user
Access	X	X	X	X
Withdrawal	X	X	X	
Management & exclusion	X	X		
Alienation*	X			

Adapted from Schlager and Ostrom, 1992: 252.

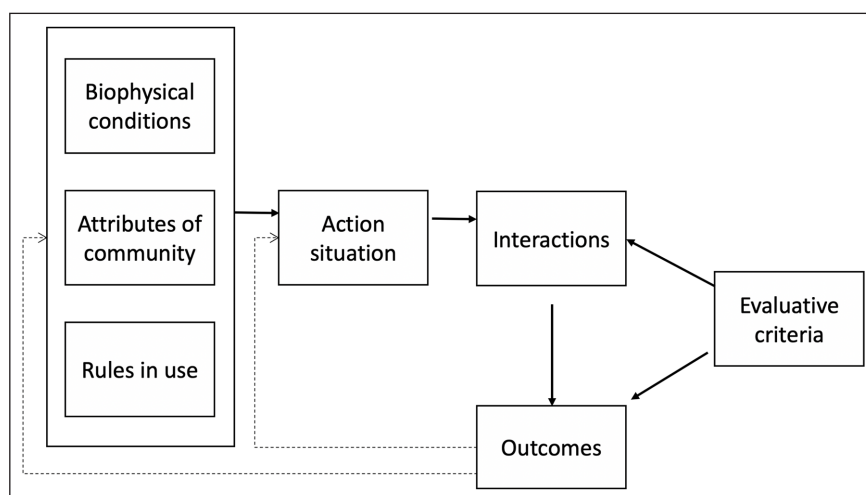


Figure 1: Institutional Analysis and Development Framework (Ostrom, 2005, McGinnis, 2011).

⁶ We recognize more recent adaptations of the bundle, in particular Sikor et al.'s (2017) model incorporating indirect and direct benefits as “use rights”; management, transaction, exclusion and monitoring as “control rights”; and definition and allocation as “authoritative rights.” While we did not test this model in our study, per request of one reviewer, we discuss findings against some of this terminology.

4. Results

Based on interviews with elder forest officials and villagers, prior to 1950 an estimated 95% of forests in Caiyuan Village were privately owned, of which approximately 40% belonged to two family clans. The remaining 5% were designated as temple, village groves, and sacred forests, and were *de facto* privately owned but treated as common property.

In Miheimen Village, prior to 1950, forests were designated as either protected or open access. Protected forests, representing 3% of the total area, included sacred forests and sacred trees, temple forests, and “dragon forests” (protected forests providing drinking water). The remaining 97% of forests were common-pool resources, providing non-timber forest products, fuel wood, timber, fertilizer, and medicines. Villagers could claim these forests for shifting cultivation.

4.1. Land Confiscation and Redistribution (1951–1956) and People’s Commune Movement (1957–1962)

After 1950, a nationwide agrarian reform was implemented. The agrarian reform resulted in the redistribution of private land titles from large landowners to poor and landless peasants. Titles were split and the majority of forests were allocated to individual peasant households, reducing the size of holdings of traditional family clans.

The redistribution and collectivization of land abolished common-property and open-access property rights in both communities. In Miheimen Village, property rights, including the rights of exclusion, were granted to several groups of households (constituting “natural villages”). Degraded secondary forests in close proximity to natural villages were divided up equitably among member households.

In 1957, the Communist Party implemented a policy that placed privately held forests in Caiyuan Village under the management of cooperatives, but landowners retained their individual titles. In 1959, small cooperatives were merged into larger “People’s Communes,” which devolved back to smaller cooperatives after only a few years. During the Great Leap Forward, the national campaign that was implemented from 1958 to 1962 to target rapid industrialization, deforestation increased substantially as a result of the use of wood for iron and steel smelting, as well as for construction and other industries. During this time, the collectivization of land ownership advanced: property rights were clarified via the issuing of land titles to collectives and supported by new organizational and legislative institutions. Boundaries were clearly demarcated, and titles provided rights of access and exclusion to cooperatives in both Caiyuan and Miheimen Villages. In Miheimen Village, study participants reported that fuel wood, non-timber forest products, and wild game were still collected by outside villagers.

4.2. Collectivization Period: 1963–1980

Throughout the 1960s and 70s, production teams in both Caiyuan and Miheimen Villages retained *de facto* rights of access and exclusion to land and resources. In Caiyuan Village, production teams harvested timber for sale to the state, using the income mainly to purchase staple foods (primarily rice) for member households. Production team member households were also permitted to gather timber, fuel wood, and non-timber forest products for household use. In Miheimen Village, little timber harvesting was possible because of a scarcity of commercially valuable species and poor transportation; households depended more on agriculture. However, within the shifting cultivation production system, collection of non-timber forest products, fuel wood, and timber for household use and furniture making was still a key source of income.

In addition to the collective property rights held by production teams, according to an amended *Working Act of the People’s Commune* (September 27, 1962), 5–7% of all arable land and waste land (e.g., barren hills) allocated to a production team could be allocated as family plots to individual households. This allowed household owners of family plots the rights of access and exclusion but not the permission to sell land (transfer ownership rights to someone outside the family). In both Caiyuan and Miheimen Villages, approximately 0.01 ha of arable lands were allocated to each household. Individual households owned trees around their houses and within their small family plots.

In 1966, Caiyuan Village established the 240-hectare Caiyuan Village Tree Farm, following an alternative property regime. The Farm was created to restore degraded land through planting of Chinese fir and today represents 24% of the village forest area. Support for the establishment of this tree farm came through a food-based reforestation program implemented throughout southern China. This program provided peasants with free bags of rice in exchange for planting trees; for Caiyuan Village, 37.5 kg of rice per hectare of reforested land were given (Jinping County, 1995). Like many other tree farms owned by administrative

villages and established through governmental support, both land and resource rights to the farm are jointly shared (in Caiyuan Village, among 1378 members, including all children, adult men and women).

Figure 2 presents a comparison of land property right regimes between Caiyuan and Miheimen Villages prior to Communist Party rule and post 1962. Prior to collectivization by the Communist Party, forests were typically owned by multiple users. Following that time, they were transformed into a single governance system via collectivization. The villagers lived in the same community as their production team and shared land ownership, carrying out farming activities and resource management on their titled land jointly.

4.3. Forest Management Diversified by De-collectivization (1981–2015) in Caiyuan Village

In the 1980s, timber was identified as a tradable commodity, and the Three Fixes Policy was launched. By 1985, villager groups⁷ received rights to access, withdraw, and exclude others from access to timber and non-timber forest products on cooperatively held land. The land was then divided among all member households. In Caiyuan Village, tree farm ownership remained unchanged. Following de-collectivization, interviewees reported significant deforestation between 1985 and 1990. Community members attributed this to a lack of confidence in their new property rights and fear that their ownership may be revoked and sought to gain the immediate benefits of timber sales. Additionally, the rising value of timber, as a result of its integration into the global market, provided further incentive for felling.

Beginning in the early 1980s, the county government of Caiyuan Village provided individual landowners with incentives (cash and food) for tree planting. The county government also enacted a provision allowing households to plant on hills classified as “barren” (*huangshan huangdi*) to enhance afforestation. Households with sufficient labor typically planted these lands with Chinese fir. Those without sufficient labor typically contracted out land for others to plant in exchange for a share of profits (typically around 20%).

Today, several land tenure and forest ownership arrangements are present in Caiyuan Village, and forests are under management of various tree farms and small-scale foresters. Assignment of specific rights to user types over specific forest resources is shown in **Table 3** and these arrangements are described as follows:

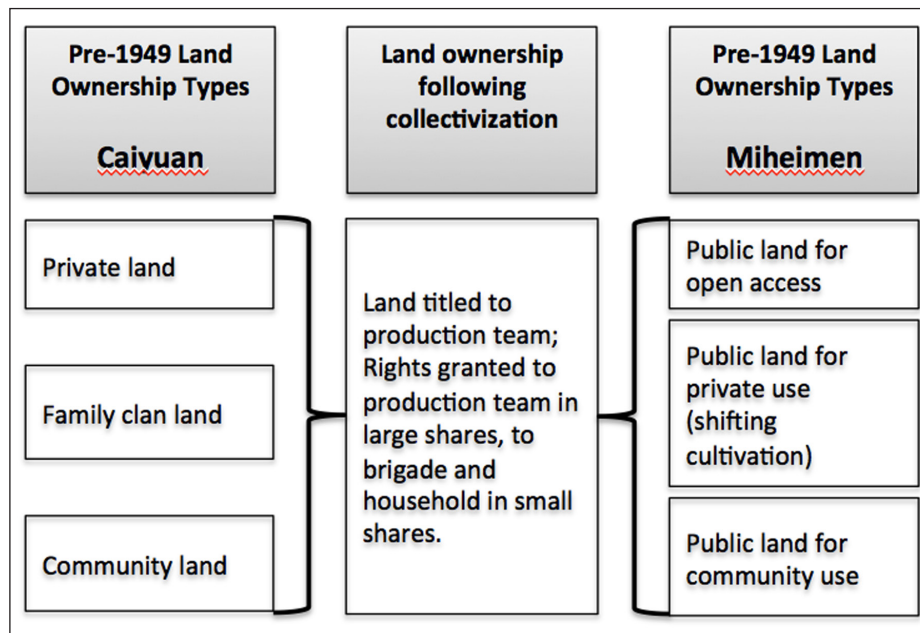


Figure 2: Comparison of the transformation of de facto land tenure in Caiyuan and Miheimen as a result of China’s collectivization from the 1950s to the 1980s.

⁷ The “commune–brigade–production team” administrative structure established during the collectivization period was changed to a “township–administrative village–villager group” structure in 1985. Production teams were replaced by “villager groups.”

Table 3: Assignment of specific rights to user types over specific forest resources in Caiyuan.

Category of forests	Resources collected	Access	Withdrawal	Management & Exclusion	Alienation	Rights arrangement category
Fengshui forest		X				authorized user
Household forest/farm	timber	X	X	X	X	owner
Shareholder farm	timber	X	X	X	X	owner
Four-Liao farm	timber	X		X	X	owner
Caiyuan farm	ecosystem services	X				authorized user

Small-scale household forests. Every household (287 in total) in Caiyuan Village owns at least one small plot of forestland (386 hectares in total) for which they hold rights to access, withdraw, and exclude.

Forest clan (*linyedahū*) or household tree farms were established for livelihood generation. Between 1987 and 1992, participating farmers were provided with 150 kg of rice and a cash subsidy of 750 yuan in exchange for planting one hectare of Chinese fir on degraded lands. Seven households initially participated in this afforestation project and became individual *linyedahū*. Households with insufficient labor leased their forestland to other community members with sufficient labor, increasing the number of household tree farms. Today, there are 76 individual *linyedahū* forest owners, who manage approximately 255 hectares, ranging between 0.53 and 4.7 hectares each.

Shareholder tree farms. Shareholder tree farms (*gufenzhi linchang*) were established by family clans (representing multiple households) in 1986, typically on degraded lands surrounding Caiyuan Village. Members typically shared expenses, labor, and revenue from sales among member households. These shareholder tree farms were typically between 2 and 7 hectares, the area reflecting the labor capacity of households working the farm. Today, approximately 10% of Caiyuan Village's forests (approximately 120 hectares) are *gufenzhi linchang*.

The Four-Liao tree farm. In 1985, a tree farm was jointly established by 95 households from four villager groups within Caiyuan Village and was named the Four-Liao tree farm. The total area of this forest farm was 81.3 hectares, 20 hectares of which was claimed by a small neighboring community of 25 households. Study participants revealed that the tree farm was established in order to resolve a land conflict over these 20 ha of land, by uniting four groups from the same family clan, surnamed Liao, giving more clout to their claim. With implementation of the Natural Forest Protection Program in 1999, prohibiting timber harvesting, the land conflict was kept quiet and the neighboring community did not raise this land conflict issue officially.

In 2009, inspired by the individualization of forests via the CFPR, many of the Four-Liao tree farm members wanted to divide and re-distribute ownership. Not all members agreed, however, and the group had no consensus on how to proceed. The county forestry authority supported the initiative to reallocate the land and made a plan to divide the land equally among the four groups.

This action rekindled the old land conflict. The neighboring community submitted an official appeal to the county forestry authority to claim ownership of the 20 ha they had contributed. At the same time, people from the neighboring community occasionally harvested small volumes of timber on the sly, reportedly in amounts of less than 1 m³ per harvest, to avoid legal penalties under the Forest Law. Nonetheless, the farm was quickly deforested, albeit in small increments. The local forest authority then decided to reverse the subdivision and re-distribution of the farm's land holdings and revert to joint ownership, to avoid the necessity of arbitration of the land conflict.

Caiyuan Village tree farm. Since 1981, the ownership of forests and forestlands in the Caiyuan Village Tree farm has remained unchanged. In 1985, 254 hectares were harvested, and the revenue was primarily spent on reforestation and community infrastructure, including the construction of a primary and a secondary school and installation of electricity and cable connections for the village. A small portion was distributed equally among member households. In 1998, the local forest authority placed all forests in the tree farm under strict protection but offered 225 yuan per ha per year from the central government in compensation to Caiyuan Village. The reduction in timber sales and the individualization of the compensation system has led to a degradation of community infrastructure, as compensation is not directed into social projects.

In sum, it can be stated that forest tenure and management in Caiyuan is fragmented among individual family-held forest plots, shareholder and private tree farms. The repeated back-and-forth between private and collective ownership can be seen as a product of both top-down intervention and a lack of local collective action. With episodes of change in tenure, overharvesting occurred more than once. Bans on logging from forest authorities resulted in both illegal harvesting and a further reduction in social cohesion around forest management, as well as a need for external policing.

4.4. Struggle for Forest Property Rights: Miheimen Village

In Miheimen Village, the 1982 Three Fixes Policy afforded each rural household property rights over forests for 15 years, extended for another 70 years in 1998. In one Miheimen Village villager group, the Kaimen Villager Group, 166.3 hectares of forests were divided among 24 households, providing each an average of 6.29 hectares. The remaining 579.5 hectares of forests located on the land surrounding the outskirts of the villager group remained under collective ownership. Another group in Miheimen Village, the Puzhaodang Villager Group, had 158.1 hectares divided among its 22 households, leaving none under collective management. Different groups within the same administrative village implemented the policy differently: farmers had a degree of agency to interpret the Three Fixes, providing a space in which local villagers could make arrangements according to their particular interests.

4.5. The Bundle of Forest Rights in Practice in Miheimen

During fieldwork, we observed that official forest rights certificates held by individual households lacked clear delimitation of boundaries and areas held, as well as any specification of which rights they afforded. Nonetheless, most residents of Miheimen Village felt assured that forest boundaries in their village were clearly delineated and that there were no conflicts among neighboring forest owners in the village (Liu et al., 2012). Although there were no physical boundary markers, landholders were familiar with each other, and to some degree followed traditions of forest management described as follows.

In practice, forests in Miheimen Village are classed into five different categories based on purpose and ownership (**Table 4**). Temple forests, holy forest, and closed forests for water collection are traditional

Table 4: Assignment of specific rights to user types over specific forest resources, by forest category, in Miheimen.

Category of forests	Resources collected	Access	Withdrawal	Management & Exclusion	Alienation	Rights arrangement category
Holy forest/ closed forests		X	X			authorized user
Burial forest		X				authorized user
Village owned forests	pine needles	X				traditional user
	fuelwood	X	X	X		authorized claimant
	mushrooms	X	X			authorized user
Household contracted forest	pine needles	X	X	X		authorized claimant
	fuelwood	X	X	X		
	timber	X	X	X	X	owner
Trees outside forests		X	X	X	X	owner

uses; however, no one is authorized to harvest any tree material. Burial forests (sacred areas where the dead are buried) are owned by family clans, who determine rights of resource access, withdrawal, and inheritance. In these forests, some users are allowed to collect pine needles, wild mushrooms, and medicinal herbs, thus making them "authorized entrants" (Ostrom and Schlager, 1996). Typically, only the landowner or proprietor is given permission to harvest trees and tree products. Until 2001, however, Miheimen Village villagers enjoyed open access rights to these forests, both within and outside the villager group, for the collection of foliage for fertilizer, firewood, and poles to use in cultivating beans, medicinal herbs, pine needles for festivals and weddings, and mushrooms. After 2001, only forests within the villager group retained open-access status. Traditionally and to this day, each family in the Yi villager group contributes labor to extract logs for house construction in any village forest, whether held by a specific family or not. Traditional village heads also have the authority to authorize felling of trees for cremation ceremonies, which are carried out within the forest using a large volume of timber. Families have access, withdrawal, exclusion, and alienation rights over trees in the family farming plots and around homesteads.

4.6. Struggles to Restrict Rights of Access and Harvesting of Mushrooms in Miheimen

The surge in market prices for matsutake mushrooms since 1995 due to Japanese market demands dramatically increased harvesting rates and the number of individual harvesters. As a result, the Kaimen Villager Group in Miheimen Village felt that their benefits from mushroom collection were being violated and took collective action to claim their ability to exclude people from outside the village (also of Yi ethnicity) from harvesting mushrooms.

In 1999, the Kaimen Villager Group organized meetings and devised a strategy to restrict the harvesting rights of outsiders. A contract system was devised whereby rights to mushrooms were granted to only five households in the group. As part of the contract, these households would prevent people from neighboring communities from entering the forests during mushroom collecting season, and other villagers from Kaimen would support them as needed. According to the national Law of Village Autonomy (Cui, 2002), the group had the legal authority to enforce this contracting scheme.

Not surprisingly, neighboring villages did not support this agreement and believed that all people should share the rights to mushroom collection, regardless of who "owned" the forests. As such, neighboring communities continued collecting but were sporadically forced out by Kaimen Village members. This eventually led to collective action in the form of invasion from neighboring villages. In November 1999, more than 1000 people from seven neighboring villages entered the forests simultaneously in protest, collecting mushrooms in defiance. The Kaimen Villager Group was incapable of preventing access and subsequently access rights for all neighboring villages were re-established.

The Kaimen Villager Group believed it should receive support from the local government and county forestry authority to restrict access to their forestland for mushroom harvesting. However, when the group brought the case forward to the township government for support after the revolt, they were told that these disputes were the internal affairs of the Yi people and should be solved through their own dispute resolution processes. The township government did not wish to intervene for political reasons and did not feel it had the means to enforce the Kaimen people's requests.

In October 2001, the Kaimen Villager Group made a second, more strategic attempt to exclude outside villages from mushroom collection. They contracted out a portion of the forests located within the village boundary for mushroom collection during the season to one person who had previously been sentenced to the jail for non-fatal violent injuries. A private security force was established along the boundary to prevent people from entering, using stones and sticks if necessary. This proved to be effective in preventing unauthorized access to mushrooms in the forest owned by the Kaimen Villager Group. The rest of the Kaimen Village forest was allocated equitably according to household size to members of the Kaimen Villager Group for mushroom collection. Households were encouraged to work together and were required to pay a membership fee permitting them access to mushroom collection. This strategy was successful at preventing mushroom harvesting by outside communities.

In 2002, other villager groups in Miheimen Village replicated the approach employed by the Kaimen Villager Group and devised cooperative systems for mushroom harvesting. Every member, regardless of age, shared equally in the revenue generated from mushroom sales. This approach proved so effective that other Yi villages in the neighboring county also adopted the approach. In 2004, the township government lauded the achievement of Miheimen Village, awarding it government funding to construct a line of roadside kiosks that could be rented out during the mushroom collection season. These kiosks became a famous mushroom market known to buyers around China and in Hong Kong and Japan.

On October 15th of each year, prior to the beginning of the matsutake collection season, all household heads attend the “Kaimen Matsutake Mushroom Abundant Harvest Conference.” During the conference, decisions are made collectively among the attendants in a transparent manner. The first activity of the conference is to return individual use rights back to the collective. All household heads have to pay the sum of 100 yuan times the number of household members to the Kaimen Villager Group. Kaimen had 263 members in 2014 and thus received 26,300 yuan. This amount was redistributed to each household, depending on the estimated value of matsutake mushrooms to be collected in the coming season from household-contracted forests. In 2014, one household received 3,000 yuan for the highest production of matsutake mushrooms, two households received 500 yuan, and most of households received 100 yuan. The amount of money to be paid back to each household each year is proposed by the official village head during the conference and is approved if there are no objections. If someone disagrees with the proposed distribution, her or she can propose a different distribution for discussion at the conference, and this proposal can be agreed upon by the conference attendees if it gains consensus. Otherwise, the traditional village head makes the final decision. In 2014, the amount to be paid back to each household as proposed by the official village head was approved by the conference.

The group today has established a fee called “*bushang shanzhu fei*” in Chinese, a lump sum levy to each member, which is collected and redistributed to each household. The fee must be submitted before the meeting and is valued at 100 yuan per family member per household. The amount that is distributed to each household depends on the estimated value of matsutake mushrooms to be collected in the coming season from household-contracted forests, based on the villagers’ experiences.

The second activity of the conference is to organize an auction to contract out the rights to mushroom harvesting. During the mushroom harvesting season, all forests are closed to all harvesting activities, other than mushroom and fuel wood collection. The total forest area (745.8 ha) is divided into 18 collection plots. Households that wish to participate in harvesting are then organized into 18 collection groups, comprising 2–5 households per group. The collection areas are then allocated to each group by means of the auction, as some plots are better than others. In 2014, 522,800 yuan (approximately US \$87,100) were collected from the sale of mushroom harvesting rights.

The last activity of the conference is to address the use of revenues. The conference attendees discuss the amount of money required for the Kaimen community. The village head provides a budget for the coming year. At the 2014 conference, the following expenditures, totaling 87,500 yuan, were approved: 1) 50,000 yuan to pave the village road; 2) 23,000 yuan for village festivals; and 3) 14,500 yuan to purchase items for group use, such as a buffet and tableware. The remainder, amounting to 435,300 yuan, was distributed equally to each member of the village group, of all genders and ages, amounting to 1200 yuan per member.

The revenue accumulated by households through mushroom sales is strongly influenced by price fluctuations in the Japanese market. According to participants interviewed, between 2003 and 2014, mushroom collection contributed 14–32% of household income (Figure 3). However, prices and associated income varies substantially from year to year. In 2006, the total net income generated from mushroom collection amounted to 918,029 yuan, compared to only 291,025 yuan in 2008, when mushroom prices

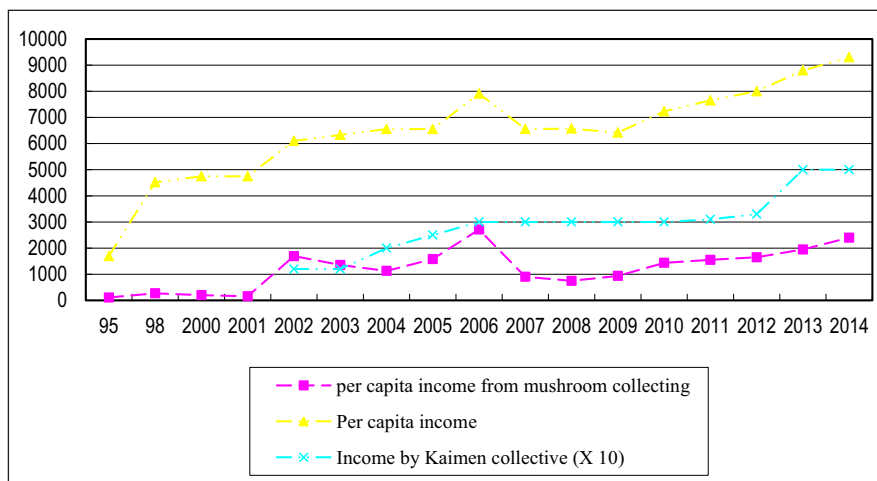


Figure 3: Income of villagers and collective at Kaimen Production Group (unit: CNY).

dropped. Despite these price fluctuations, the Kaimen Villager Group appears to be better off financially than other villages in the region. According to the village head, 81% of households own a car—the highest rate of vehicle ownership rate in Nanhua County, where less than 5% of residents overall owned cars in 2014.

4.7. Nominal implementation of the CFPR in Miheimen

During the field survey in 2007, the original copy of the forest title issued to each household in 1998 was examined. There is no useful information provided in these certificates (Liu et al., 2012). However, every interviewee clearly explained the boundaries of the forests that the family owned and declared that no conflicts existed among neighboring forest owners in the village.

Interviews held with forestry officials from the Nanhua County Forestry Authority during fieldwork in 2009 revealed that forests were not allocated to individual households. According to the officials interviewed, there are impracticalities associated with the delineation of boundaries between plots held by different households. This is in part due to the fact that households often hold a number of small patches of forest separated by some distance, some of which are located in remote mountainous areas.

During our second-to-last visit to Miheimen Village in 2013, villagers revealed that forest title certificates had not yet been issued. County forestry officials complained about how busy they were in implementing CFPR, having to prepare piles of documents for upper-level authorities prior to issuing property right certificates to each household. According to one official from the Wujie Township Forest Station, *“We have no time to go to Miheimen Village, and fortunately, the village heads have provided sufficient information for us to report. New certificates will be ready soon.”*

During our final visit in February 2015, household forest title certificates had been received by the village committee: a vital step in implementing the CFPR. The new certificates contained minimal information on the new property right arrangements, however, specifying only the acreage of allocated forestland and the location of plots on a drawn map, in a manner similar to the certificates issued in 1998. According to villagers in Miheimen Village, they had been told that the new certificate was acceptable as collateral for obtaining a mortgage, while the former certificate had not been. Responding to the question of how the CFPR effected their forest management practices, all interviewees reported that it had not: “no, we do as before.”

5. Discussion

Our results show very different outcomes of the many phases of forest land reform in the two case villages culminating in the decollectivization program. In Caiyuan, with its long history of economic dependence on timber, governance of the majority of the village forest estate ended up fragmented between different forms of land and resource holding, with the most valuable timber resources locked up under extraction bans. In Miheimen, a model for collective management and sharing of a profitable non-timber mushroom crop was implemented and upscaled in spite of decollectivization policies.

The Institutional Analysis and Development Framework (**Table 5**) helps to visualize the main factors affecting these outcomes. While Caiyuan was located in a longstanding timber producing area, Miheimen depended largely on shifting cultivation and extraction of non-timber forest products. Caiyuan had a long history of private land holding by owners of different social groups; in contrast, Miheimen had a tradition of collective land holding by a socially cohesive ethnic group. Following collectivization during the People’s Commune and cooperative periods (Action Situation I), social interaction following government-implemented de-collectivization actions starting in the 1980s was manifested in tenure insecurity in Caiyuan, with an initial outcome of competition for resources, and unpermitted overlogging. In contrast, in Miheimen, interactions following de-collectivization led to resistance among a particular villager group who saw collective management, access, exclusion and withdrawal rights as a means to ensure their community welfare.

These very different responses to the same basic policies sparked equally different reactions. In Caiyuan, local officials enforced logging bans affecting the more established and larger timber plantation area (Action Situation II), resulting in indebtedness and conflict. Compensatory funds disbursed to offset losses, meanwhile, did not have the intended effects. In Miheimen, on the other hand, when villagers sought assistance from local officials in setting up their new collective management system and protecting their resources from outside access/withdrawal, they were left to work things out themselves. Ultimately the system they put in place for access and benefit sharing became a model for the area and was upscaled to the county level. While the outcomes of these interactions between policy and local agency doubtless may continue to evolve, the mix of forest property types and associated management in Caiyuan have been inefficient and unsustainable, with poor accountability. In comparison, the legitimacy, equity, sustainability,

Table 5: Analysis of institutional development following Ostrom's (2005) IAD Framework.

Exogenous variables		Rules in use				Action situation I		Action situation II		Outcomes I		Outcomes II	
Biophysical conditions	Attributes of community												
Caiyuan Village (Guizhou Province)	Multi-ethnic population (Miao & Dong)	Pre-1949: History of private, "family clan," and some common land ownership	1980s to 2015: Access, withdrawal and exclusion rights shifted to villager groups and then individual HHs.	Several phases of collectivization and decollectivization and competition among different groups with various forest interests (Caiyuan Tree Farm, Shareholder Tree Farms, Four-Liao Tree Farm, household forest plots) result in loss of confidence in property rights	Local officials and national government implement logging bans	Loss of confidence in property rights cause over logging & deforestation	Social dysfunction around forestry and failure of forest management to generate income results in increased deforestation and declining infrastructure	Evaluation Criteria: Inefficiency, lack of accountability for forest management, low sustainability	Evaluation Criteria: High efficiency and equity, accountability, legitimacy, and sustainability	Surrounding villages and neighbor county adopt Kaimen Villager model of user rights	Prosperous business in market for mushrooms and maintenance of collective management and use rights	↖	↗
		1957–1962: forest property assigned to cooperatives; smaller cooperatives merged into "People's Communes" in 1959, then redivided into smaller cooperatives. Titles granted to cooperatives, with rights of access & exclusion.	1982 3-Fixes policy shifts forest rights to individual HHs; length of tenure increases from 15 to 70 years in 1998	Natural villager groups interpret policy differently, with Kaimen Villagers leaving majority of forest in collective ownership	After invasions by outside villagers, Kaimen Villagers establish security force to protect mushroom resource and establish rules of access and benefit sharing	Outsiders claim rights to continue mushroom harvesting in Kaimen Villager collective forests							
Miheimen Village (Yunnan Province)	Mono-ethnic population (Yi) organized in villager groups (Kaimen and forest products)	Pre-1949: History of public lands (open access, shifting cultivation by "private" users, community use)	Pre-1949: History of public lands (open access, shifting cultivation by "private" users, community use)	1962: Property allocation of small plots (0.1 ha) to HHs	Reliance on agriculture and non-timber forest products; scarcity of timber for economic use	Large crop of wild matsutake mushrooms	Large crop of wild matsutake mushrooms	↖	↗	↖	↗	↖	↗

and accountability of the collective management and use rights system of the Miheimen villagers group are apparent in the associated economic success and broader adoption of their model.

Our research underlines the fact that there is no one solution that fits all forest property rights regimes. In practice, CFPR has not been uniformly implemented because of the unique interplays among socio-ecological history, community dynamics, and global economic trends. Over time, *de jure* property rights over forests in the two case villages have changed significantly, as they have throughout China, but they have been interpreted and implemented very differently.

In itself, this is not surprising: many researchers have noted this gap between policy and practice in property rights under reform, as farmers seek to avoid risks associated with change (e.g. Qin et al., 2011; Kashwan, 2011), take profit prior to exclusion, resulting in deforestation (Solarzano and Fleischman, 2018; Padoch et al., 2014), or mobilize from the grassroots level to achieve more suitable arrangements (Garcia-Lopez and Antinori, 2018). As a perceptive reviewer of an earlier draft of this paper noted, diverse arrangements are necessary consequences because increasing local autonomy inevitably produces diverse results. One community (such as Miheimen) may have the social cohesion as well as the vision to interpret rules and contact relevant higher authorities to assert their property rights (as noted in Ratner et al., 2013), while another (such as Caiyuan) may lack the trust and egalitarian relations required to join forces and find a mutually beneficial solution (as considered key to socioecological resilience by Janssen, 2011).

The type of goods covered under property systems also effects the emergence and nature of collective actions, which may have different effects on the actual outcomes of reforms (Ostrom, 2003). In Caiyuan Village, where private ownership of timber resources prevailed for more than 400 years, collectivization produced a system of forest management focused on planting and producing more timber, which could be sold for the financial gain of both individuals and the collective. With decentralization, several categories of forests and forest farms were established (e.g., *linyè dahu* and tree farms), each with the aim of generating economic returns. The initial result was a wave of deforestation as the imposition of new boundaries resulted in perceived tenure insecurity and revived old conflicts that had been locally negotiated, requiring adjustment from above by officials exercising authoritative rights. The configurations of forest ownership, management, use, and benefit distribution remain fragmented to this day, resulting in sub-optimal contributions to the public good. As noted by Sikor et al. (2017), “compensated exclusions” providing indirect benefits (such as the subsidies paid to individual land holding families in Caiyuan) may compensate the loss of direct benefits of forest use and exclusion from governance, but in this case, the loss of collective benefits has resulted in a decline of community infrastructure and, we suspect, an associated decline in social cohesion.

In Miheimen Village, several types of traditional forest used collectively to fulfill regular local needs for wood remain under traditional management. The majority of forests, however, produce a non-timber good (valuable mushrooms), which are a collective resource owned and defended by a community of resource users implementing a system devised for more equal sharing of revenues from the harvest. The establishment of this system required collective action and self-organization by traditional users, who demanded support from official township and county forestry channels but were largely left to devise their own solutions, which included a light militia of forest guards to prevent incursion by non-members. In part, the ability to thus organize likely arose from a high degree of social cohesion associated in part with shared ethnic identity and traditional values, though more research is needed to substantiate this determinant.

Another factor is likely the nature of the good over which rights of exclusion and control were being sought. Mushroom production requires an area of healthy forest, so it would be unlikely for the community taking control to deforest the land. In part, this could explain why higher-level authorities with interest in the protection of forests might have been less interested in intervening, but rather observed from a distance and later adopted lessons from the outcome. We can interpret this outcome as a *de facto* devolution of authoritative and control rights to the village level, in an area where the value of timber is less of a threat to forest cover and thus to the interests of forest officials at the county level and above, in contrast to two Sikor et al. (2017) cases: in the first, central state units maintained such higher-level rights; in the other the authors believe that the involvement of global NGOs mitigated to some degree the top-down nature of forest governance, presumably by forcing “stakeholder engagement.” In the case of Miheimen, it was cohesive local traditional authority to derive and distribute direct benefits from a non-timber resource that provided the impetus to claim rights of authority and control in response to top-down abdication. As noted by Fischer and Ali (2018), “[t]he specific benefits that local government provides may ultimately be of less importance than what has happened in the process—the further entrenchment of institutions that offer new avenues for the collective negotiation of local needs.”

In sum, we interpret the causes and outputs of variability of implementation of CFPR in the two villages to be a product of different levels of social cohesion and different traditions of property rights (private vs. collective), as well as different economic incentives associated with the resource (timber vs. a non-timber product). In Caiyuan, there was a longstanding culture of private property rights over forests and trees combined with an ethnically diverse population. The primary resource of forests was timber, which, due to over-extraction, has been subject to various logging bans over time. Successive policy changes between private and collective ownership combined with a resource deprived of economic value (due to logging bans) resulted in a fragmentation of forest management. In contrast, in Miheimen, collective forest management was the norm among a largely mono-ethnic population with strong traditional institutions. With a renewable non-timber resource of great economic value, the local community had both a strong incentive and the means to implement an effective sustainable management system based on collective use rights.

6. Conclusions

Based on these case studies, we are able to draw several practical insights on the interplay between central land tenure reform and local governance of collective and individual holdings. First, when livelihoods are put at risk by de-collectivization policies, management rights and associated benefits may either be fragmented as individual and sub-groups seek to maintain or acquire rights, or a movement to maintain common property rights may arise. Communities with sufficient capacity to organize may use collective action to protect their land and resource access rights. This capacity is likely to depend on the prevailing degrees of social cohesion and legitimacy of leadership. Long traditions of community autonomy in China, with multiple layers of authority between the central government to the community, act as buffers that make room for the adaptation of policies. The top-down centralized administrative state in China is successful in part because local resistance is, in fact, allowed when policies depart from local needs. Thus, forest property right policies can be implemented in diverse ways, depending on the historical conditions, needs, and capacities of local communities.

More generally, the findings of this paper resonate with recent work by Kashwan (2016), which brings insights on local agency and autonomy. First, Kashwan finds that a history of community-based forestry generates demand for collective forest management rights. In the case of Miheimen, longstanding community control of local forests stands in contrast to the ancient history of private ownership in Caiyuan. In the face of reforms, Miheimen fell back on collective rights, while Caiyuan forestry fell into pieces as the government seesawed between collectivization and privatization. Second, "large areas of forest affected by land-use conflicts undermine the propensity of community groups to demand collective forestry rights"; as the government finally promoted privatization, individuals in Caiyuan had little incentive to pull together, even if central authorities had the propensity to devolve higher-level rights. Finally, financial autonomy of village forestry groups drives demand for collective forest management rights. In Miheimen, proceeds from the mushroom resource, which is not a threat to forest cover and therefore to forestry officials, far outweighs the amount of subsidies provided to holders of small forest plots distributed in Caiyuan, over which strict protective measures have been established to prevent deforestation.

Finally, given the existence of a legal basis for village-level autonomy in China, there is a mechanism for negotiation, reinterpretation, and incorporation of both traditional and novel systems for the distribution rights to lands and resources. Further studies are needed to better understand the factors that produce diverse patterns of individual and collective land and resource rights at the interface between top-down policy and local models of dividing and sharing forestlands and their benefits. However, given the tendency towards privatization and individualization of forest holdings and management in China and some indications of farmer preferences in that direction (e.g. Qin et al., 2011), as well as a greater interest in household-level rather than village-level autonomy affecting participation in forest land allocations and national/provincial/county forestry subsidy programs (e.g. Bennett et al., 2014), the particular form of collective action we have presented here is important. First, it demonstrates the potential for Chinese authorities to exercise flexibility or restraint when encountering a well-grounded and cohesive grassroots movement. Second, it underscores the need to understand the particular influence of local social organization and resource behavior prior to and during the implementation of national land and resource reforms.

Acknowledgement

This work was supported by the National Natural Science Foundation of China [71673288, 71773018 and 71973145]. Many thanks are due for the support of community people and local authorities during field work. We are grateful as well to two anonymous reviewers for their valuable critical input, and to the editor of the journal for their patience during several revision processes.

Competing Interests

The authors have no competing interests to declare.

References

- Agrawal, A., & Gibson, C.** (1999). Enchantment and disenchantment: The role of community in natural resource conservation. *World Development*, 27(4), 629–649. DOI: [https://doi.org/10.1016/S0305-750X\(98\)00161-2](https://doi.org/10.1016/S0305-750X(98)00161-2)
- Agrawal, A., & Ostrom, E.** (1999). Collective Action, Property Rights and Devolution in Forest and Protected Area Management. *Paper for Workshop in Political Theory and Policy Analysis, Indiana University June* (pp. 21–25).
- Agrawal, A., & Ribot, J.** (1999). Accountability in decentralization: A framework with South Asian and West African cases. *The Journal of Developing Areas*, 33(4), 473–502.
- Banana, A. Y., & Gombya-Ssembajjwe, W.** (2000). Successful forest management: The importance of security of tenure and rule enforcement in Ugandan Forest. In C. C. Gibson, M. A. Makean & E. Ostrom (Eds.), *People and Forest: Communities, Institutions and Governance* (pp. 87–97). Cambridge: Massachusetts Institute of Technology.
- Bennett, M. B., Xie, C., Hogarth, N., Peng, D. L., & Putzel, L.** (2014). China's Conversion of Cropland to Forest Program for Household Delivery of Ecosystem Services—How Important is a Local Implementation Regime to Survival Rate Outcomes? *Forests*, 5(9), 2345–2376. DOI: <https://doi.org/10.3390/f5092345>
- Clement, F.** (2010). Analysing Decentralised Natural Resource Governance: Proposition for a 'Politicised' Institutional Analysis and Development Framework. *Policy Sciences*, 43(2), 129–56. DOI: <https://doi.org/10.1007/s11077-009-9100-8>
- Coleman, E., & Liebertz, S.** (2014). Property rights and forest commons. *Journal of Policy Analysis and Management*, 33(3), 649–668. DOI: <https://doi.org/10.1002/pam.21766>
- Colfer, C. J. P., Dahal, G. R., & Capistrano, D.** (2008). *Lessons from Forest Decentralization: Money, Justice and the Quest for Good Governance in Asia-Pacific*. Center for International Forestry Research (CIFOR). London: Earthscan.
- Cui, Z.** (2002). Issues of local governance and rural land. *China Rural Survey*, 3, 2–13.
- Dong, X.-Y.** (1996). Two-tier land tenure system and sustained economic growth in post-1978 rural China. *World Development*, 24(5), 915–928. DOI: [https://doi.org/10.1016/0305-750X\(96\)00010-1](https://doi.org/10.1016/0305-750X(96)00010-1)
- Edmunds, D., & Wollenburg, E.** (2003). *Local Forest Management: The Impacts of Devolution Policies*. London: Earthscan.
- Ferguson, I., & Chandrasekharan, C.** (2005). Paths and pitfalls of decentralisation for sustainable forest management: Experiences of the Asia-Pacific region. In: C. J. P. Colfer & D. Capistrano (Eds.), *The Politics of Decentralization: Forests, Power and People* (pp. 63–85). London: Earthscan.
- Fischer, H. W., & Ali, S. S.** (2018). Reshaping the public domain: Decentralization, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), and trajectories of local democracy in rural India. *World Development*, 120, 147–158. DOI: <https://doi.org/10.1016/j.worlddev.2018.09.013>
- Garcia-Lopez, G., & Antinori, C.** (2018). Between Grassroots Collective Action and State Mandates: The Hybridity of Multi-Level Forest Associations in Mexico. *Conservation and Society*, 16(2), 193–204. DOI: https://doi.org/10.4103/cs.cs_16_115
- Hall, D., Li, T., & Hirsch, P.** (2011). *Powers of Exclusion*. Singapore: NSU Press.
- Hickey, S., & Mohan, G.** (2005). Relocating participation within a radical politics of development. *Dev. Change*, 36, 237–62. DOI: <https://doi.org/10.1111/j.0012-155X.2005.00410.x>
- Huang, B., & Lan, T.** (1988). Review of cultivation and utilization history of Chinese Fir. *Journal of Nanjing Forestry University*, 2: 17–20. (Chinese).
- Janssen, M.** (2011). Resilience and adaptation in the governance of social-ecological systems. *International Journal of the Commons*, 5(2), 340–5. DOI: <https://doi.org/10.18352/ijc.320>
- Jiang, J.** (2006). Collective forest tenure reform in China and main research questions. *Presentation at the International Workshop on Forest Tenure Reform*, Beijing, China. (Chinese).
- Jinping County.** (1995). *Annals of Jinping County*. Guiyang, China: Guizhou People's Publishing House. (Chinese).
- Kashwan, P.** (2016). What explains the demand for collective forest rights amidst land use conflicts? *Journal of environmental management*, 183, 657–666. DOI: <https://doi.org/10.1016/j.jenvman.2016.08.031>
- Kelly, A. B., & Peluso, N. L.** (2015). Frontiers of commodification: State lands and their formalization. *Society and Natural Resources*, 28(5), 473–495. DOI: <https://doi.org/10.1080/08941920.2015.1014602>

- Larson, A. M.** (2005). Democratic decentralisation in the forestry sector: Lessons learned from Africa, Asia and Latin America. In C. J. P. Colfer & D. Capistrano (Eds.), *The Politics of Decentralization: Forests, Power and People* (pp. 22–62). London: Earthscan.
- Larson, A. M.** (2011). Forest tenure reform in the age of climate change: Lessons for REDD+. *Global Environmental Change*, 21, 540–549. DOI: <https://doi.org/10.1016/j.gloenvcha.2010.11.008>
- Larson, A. M., & Soto, F.** (2008). Decentralization of Natural Resource Governance Regimes. *Annu. Rev. Environ. Resour.*, 33, 213–39. DOI: <https://doi.org/10.1146/annurev.enviro.33.020607.095522>
- Li, J., Kong, F., & He, N.** (1988). China's Forestry, Analysis and Proposal. *Management World*, 1, 152–168. (Chinese).
- Lie, L.** (2014). Opening Remarks at the Conference of “Underplanting Economy and Low Carbon Development,” 21 April, 2014, Beijing University China. Accessed May 26, 2020. <https://business.sohu.com/20130424/n373841657.shtml>
- Lin, J. Y.** (1992). Rural reforms and agricultural growth in China. *The American Economic Review*, 82(1), 34–51.
- Liu, J.** (2006). *Forests in the mist*. Ph.D. thesis. Wageningen, The Netherlands: Wageningen University.
- Liu, J.** (2009). Reconstructing the history of forestry in northwestern China 1949–1998. *Global Environment*, 4, 188–219. DOI: <https://doi.org/10.3197/ge.2009.020308>
- Liu, J., & Innes, J.** (2015). Participatory forest management in China: Key challenges and ways forward. *International Forestry Review*, 17, 27–34. DOI: <https://doi.org/10.1505/146554815817476512>
- Liu, J., Zhang, R., & Zhang, Q.** (2012). Traditional forest knowledge of the Yi people confronting policy reform and social changes in Yunnan province of China. *Forest Policy and Economics*, 22, 9–17. DOI: <https://doi.org/10.1016/j.forpol.2011.12.010>
- Liu, J., & Zhao, L.** (2009). Have decollectivization and privatization contributed to sustainable forestry management and poverty alleviation in China? In: *Forestry Policy and Institutions* (Working Paper 23). Rome: Food and Agriculture Organization of the United Nations.
- Ma, X., Heerink, N., Feng, S., & Shi, X.** (2015). Farmland tenure in China: Comparing legal, actual and perceived security. *Land Use Policy*, 42, 293–306. DOI: <https://doi.org/10.1016/j.landusepol.2014.07.020>
- Mattingly, D. C.** (2016). Elite Capture: How Decentralization and Informal Institutions Weaken Property Rights in China. *World Politics*, 68(3), 383–412. DOI: <https://doi.org/10.1017/S0043887116000083>
- McGinnis, M. D.** (2011). An introduction to IAD and the language of the Ostrom workshop: a simple guide to a complex framework. *Policy Studies Journal*, 39(1), 169–183. DOI: <https://doi.org/10.1111/j.1541-0072.2010.00401.x>
- McMillan, J., Whalley, J., & Zhu, L.** (1989). The impact of China's economic reforms on agricultural productivity growth. *The Journal of Political Economy*, 781–807. DOI: <https://doi.org/10.1086/261628>
- Meinzen-Dick, R., & Pradhan, R.** (2002). Legal Pluralism and Dynamic Property Rights. *CAPRI Working Paper No. 22*. Washington, DC: International Food Policy Research Institute.
- Ostrom, E.** (2003). How Types of Goods and Property Rights Jointly Affect Collective Action. *Journal of Theoretical Politics*, 15(3), 239–70. DOI: <https://doi.org/10.1177/0951692803015003002>
- Ostrom, E.** (2005). *Understanding institutional diversity*. Princeton University Press. DOI: <https://doi.org/10.1515/9781400831739>
- Ostrom, E., & Nagendra, H.** (2006). Insights on linking forests, trees, and people from the air, on the ground, and in the laboratory. *Proceedings of the National Academy of Sciences*, 103, 19224–19231. DOI: <https://doi.org/10.1073/pnas.0607962103>
- Ostrom, E., & Schlager, E.** (1996). The formation of property rights. In S. Hanna, C. Folke & K. Mäler (Eds.), *Rights to nature* (pp. 127–156). Washington, DC: Island Press.
- Padoch, C., Steward, A., Pinedo-Vasquez, M., Putzel, L., & Miranda Ruiz, M.** (2014). Urban residence, rural employment, and the future of Amazonian forests. In S. B. Hecht, K. D. Morrison & C. Padoch (Eds.), *The Social Lives of Forests: Past, Present, and Future of Woodland Resurgence* (pp. 322–335). Chicago: University of Chicago Press. DOI: <https://doi.org/10.7208/chicago/9780226024134.003.0030>
- Peluso, N. L., Kelly, A. B., & Woods, K.** (2012). Context in land matters. Bogor, Indonesia: *Center for International Forestry Research*. Accessed August 10, 2016. <http://www.cifor.org/fileadmin/subsites/proformal/PDF/RPeluso1210.pdf>
- Putzel, L., Jaung, W., Forrest, B., Finke, A., Liu, W., & Peng, P.** (2019). *Fragmentation of forest governance in the Asia-Pacific region*. Beijing: Asia Pacific Network for Sustainable Forest Management and Rehabilitation. Accessed December 13, 2019. <https://www.cifor.org/library/7297/>

- Putzel, L., Kelly, A. B., Cerutti, P. O., & Artati, Y.** (2015). Formalization as development in land and natural resource policy. *Society & Natural Resources*, 28(5), 453–472. DOI: <https://doi.org/10.1080/08941920.2015.1014608>
- Qin, P., Carlsson, F., & Xu, J.** (2011). Forest Tenure Reform in China: A Choice Experiment on Farmers' Property Rights Preferences. *Land Economics*, 87(3), 473–87. DOI: <https://doi.org/10.3368/le.87.3.473>
- Ratner, B. D., Meinzen-Dick, R., May, C. C., & Haglund, E.** (2013). Resource conflict, collective action, and resilience: an analytical framework. *International Journal of the Commons*, 7(1), 183–208. DOI: <https://doi.org/10.18352/ijc.276>
- Ribot, J. C.** (2002). *Democratic Decentralization of Natural Resources*. Washington, DC: World Resources Institute, p. 30. DOI: https://doi.org/10.1057/9781403981288_6
- Ribot, J. C., Agrawal, A., & Larson, A. M.** (2006). Recentralizing while decentralizing: How national governments reappropriate forest resources. *World Development*, 34(11), 1864–1886. DOI: <https://doi.org/10.1016/j.worlddev.2005.11.020>
- Rodriguez Solorzano, C., & Fleischman, F.** (2018). Institutional legacies explain the comparative efficacy of protected areas: Evidence from the Calakmul and Maya Biosphere Reserves of Mexico and Guatemala. *Global Environmental Change*, 50, 278–288. DOI: <https://doi.org/10.1016/j.gloenvcha.2018.04.011>
- Rozelle, S., Brandt, L. G., & Huang, J.** (2005). Land tenure in China. In P. Ho (Ed.), *Developmental dilemmas: Land reform and institutional change in China* (pp. 107–132). London & New York: Routledge.
- Schlager, E., & Ostrom, E.** (1992). Property-rights regimes and natural resources: A conceptual analysis. *Land Economics*, 68(3), 249–262. DOI: <https://doi.org/10.2307/3146375>
- [SFA] State Forestry Administration.** (2014). *China Forestry Development Report*. Beijing: China's Forestry Publication House.
- [SFGA] State Forestry and Grasslands Administration.** (2017). Summary of achievements of National Collective Forest Tenure Reform. Accessed May 29, 2020. <http://www.forestry.gov.cn/main/72/content-1005409.html>
- Sikor, T., He, J., & Lestrelin, G.** (2017). Property Rights Regimes and Natural Resources: A Conceptual Analysis Revisited. *World Development*, 93, 337–49. DOI: <https://doi.org/10.1016/j.worlddev.2016.12.032>
- Tacconi, L.** (2007). Decentralization, forests and livelihoods: Theory and narrative. *Global Environmental Change*, 17(3–4), 338–348. DOI: <https://doi.org/10.1016/j.gloenvcha.2007.01.002>
- Tu, C., Long, H., & Liu, J.** (2016). Under the perspective of forest landscape restoration: Experience of soil erosion control in Changting County, Fujian Province. *Forestry Economics*, 38, 14–18. (Chinese).
- Wong, X.** (2015). Land requisitions and state–village power restructuring in southern China. *China Quarterly*, 224, 888–908. DOI: <https://doi.org/10.1017/S0305741015001241>
- Xu, J., Sun, Y., & Jiang, X.** (2008). Collective forest tenure reform in China: Analysis of Pattern and Performance. *Forest Economics*, 9, 27–38. (Chinese).
- Yan, P., & Chen, H. Y.** (2010). Brief analysis on the relationship between efficiency and equity in forest right reform in China. *Forestry Economics*, 6, 57–59. (Chinese).
- Yi, Y., Köhlin, G., & Xu, J.** (2014). Property rights, tenure security and forest investment incentives: Evidence from China's collective forest tenure reform. *Environment and Development Economics*, 19, 48–73. DOI: <https://doi.org/10.1017/S1355770X13000272>
- Zhang, H., & Xu, J.** (2009). Collective Forest Tenure Reform: Assessment of Motivation, Characteristics and Performance. *Scientia Silvae Sinicae*, 45(7), 119–126.
- Zhang Y., Kant, S., & Liu, J.** (2019). Principal-agent relationships in rural governance and benefit sharing in community forestry: Evidence from a community forest enterprise in China. *Forest Policy and Economics*. DOI: <https://doi.org/10.1016/j.forpol.2019.05.010>
- Zhu, L., & Jiang, Z. Y.** (1993). From brigade to village community: The land tenure system and rural development in China. *Cambridge Journal of Economics*, 17(4), 441–461. DOI: <https://doi.org/10.1093/oxfordjournals.cje.a035248>

How to cite this article: Liu, J., Dong, J., Long, H., Xu, T., & Putzel, L. (2020). Private vs. Community Management Responses to De-Collectivization: Illustrative Cases from China. *International Journal of the Commons*, 14(1), pp. 445–464. DOI: <https://doi.org/10.5334/ijc.971>

Submitted: 19 March 2019

Accepted: 11 August 2020

Published: 18 September 2020

Copyright: © 2020 The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC-BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. See <http://creativecommons.org/licenses/by/4.0/>.

]u[

International Journal of the Commons is a peer-reviewed open access journal published by Ubiquity Press.

OPEN ACCESS 