

1 **Privatization or communalization: a multi-level analysis of changes in forest**
2 **property regimes in China**

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Abstract

Over recent decades, the Chinese government has invested heavily in improving the country's forest tenure system through the Collective Forest Tenure Reform. This reform has primarily focused on privatization of collectively-owned forests, which has been perceived to improve effective forest management by providing incentives to farmers. This paper documents results of the Collective Forest Tenure Reform and the factors that have shaped these results through a multi-level analysis: at the national, regional, community and individual levels. It was found forest privatization implemented through the tenure reform was much less than what government expected. Instead, as shown in illustrative case-studies, people intend to retain the forest as common property in a way that creates a complex communal forest management system. The paper argued that while it is good the government is willing to improve forest tenure security for local people, there is a need to better consider the local perceptions of the tenure reform policy's effectiveness and efficiency, and justice in forest management, and to understand the complexity of the pre-existing communal forest management system that exists throughout the country.

Keyword: Collective Forest Tenure Reform; communal management; community forest; property rights; effectiveness; justice;

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41 **1. Introduction**

42 China's collectively-owned forests account for the largest share of the world's
43 community forests, comprising over 60% of the total community forest resource in Asia
44 and the Pacific (Sikor et al., 2013) and reaching nearly 30% of the resource among the
45 52 most forested countries in the world (RRI, 2014). These collectively-owned forests
46 comprise about 60% of China's total forest area (State Council 2008) and contribute
47 significantly to regional and global environmental services and the rural livelihoods of
48 about 600 million households in China (Xu, 2010). Since 2003, the Chinese government
49 has initiated a new round of Collective Forest Tenure Reform to promote tenure
50 devolution, which follows an earlier forest reform from the 1980s. Learning from the
51 success of privatization¹ in agricultural and industrial sectors, this reform aimed to
52 provide incentives to farmers for forest management by promoting individual forest
53 holdings through an egalitarian distribution of the collectively-owned forest resource².
54 The government believes this privatization of the collective forest resource would
55 improve the forest condition and local livelihoods (c.f. Xu and Hyde, 2019). To ensure
56 the stability and constancy of this forest tenure reform, the central government invested
57 approximately USD 370 million in the boundary delineation, surveying, titling and
58 registration of the new plots since 2008 (Xu et al. 2010). The government also aimed to
59 accomplish its key mission to clarify property rights and allocate at least 80% of the
60 collective forest to individual households by 2013 (State Council, 2008). As such, China's
61 collective forest tenure reform has attracted considerable international attention.
62 Research into this reform would make a significant contribution to global experiences
63 with forest tenure reform and community forestry development (Hyde, 2019).

64

65 There is a growing international literature on China's Collective Forest Tenure
66 Reform (CFTR). Much of this research has focused on examining the reform's outcomes
67 in terms of incentivizing local investment in forest management and has concluded
68 there have been positive effects as a result of improved tenure security (Qin et al., 2011;
69 Yi et al., 2014; Qin and Xu, 2013; Xie et al., 2014; Ren et al., 2018; Huang et al., 2019;
70 Zhou et al., 2018; Lu et al., 2016; Li et al., 2016; He, et al., 2015; Liu et al., 2017; Wei and
71 He 2016). Others have taken a critical perspective to investigate how local conditions
72 may affect the reform, finding the tenure reform has led to conflict between de facto and
73 de jure tenure arrangements (Liu et al., 2016; Luo et al., 2015). Taking a case-study
74 approach at a local level, scholars have also revealed the local variation in governance
75 processes have shaped the implementation of the reform and generated mixed results
76 (e.g. He and Sikor, 2017; Zinda and Zhang, 2018). At a higher level, many others have
77 suggested there are a range of institutional challenges with the reform, including
78 property rights ambiguity (Ho, 2014; He, 2016), top-down implementation (Robbins

¹ This paper considers privatization to refer to the transfer of resource use rights and control from public or collective control to individuals, instead of a narrow definition of transferring ownership to private interests.

² It is the government's perspective that collective ownership leads to inefficient resource use, while forest privatization has been promoted, as influenced by Hardin (1968).

79 and Harrell, 2014; Yin, et al., 2013), and potential institutional conflicts (Liu et al., 2016;
80 Hyde and Yin, 2019). However, the actual results of privatization in this reform remain
81 unclear in terms of changing areas under different forest property regimes. In particular,
82 there is a lack of understanding of the factors affecting those changes. Thus, new
83 evidence supported by a novel analysis of the forest tenure reform is urgently needed to
84 provide thoughtful insights into China's Collective Forest Tenure Reform.

85
86 At a global level, forest tenure reform has been widely implemented to allocate
87 forests to Indigenous people and communities across the world (Yin et al., 2016; Larson
88 and Dahal, 2012; Sikor et al., 2017; RRI, 2014). While existing literature has evidenced
89 the positive aspects of tenure reform in improving forest condition and local livelihoods
90 (Blackman and Veit, 2018; Mistry and Berardi, 2016; Robinson et al., 2014, 2018),
91 research also calls for particular attention to understanding legal pluralisms (Gebara,
92 2018), customary institutions (Linkow, 2016), local governance (Larson, 2011), forest
93 tenure diversification (He et al., 2014), and conflict between formal and actual tenure
94 (Sikor, 2006). Taking the analytical framework of forest decentralization, scholars have
95 highlighted that positive effects of devolving forest tenure systems can be limited by a
96 lack of downward accountability mechanisms (Ribot et al., 2006), elite capture (Lund
97 and Saito-Jensen, 2013), institutional constraints (Sahide et al., 2016) and insufficient
98 power transfer (He and Xu, 2017). Among these studies, devolving forest tenure to local
99 communities is a primary focus, while rare attention has been paid to forest devolution
100 through privatization. There is a gap in understandings of the factors affecting the
101 implementation of forest privatization, particularly in the case of China, the country with
102 the largest share of community forests in the world. To fill the gap, there is a need to
103 obtain thoughtful insights into forest tenure reform by combining large-scale analysis
104 with local case-studies. Doing so in a way that combines qualitative and quantitative
105 approaches would provide additional evidence-based knowledge to the international
106 literature.

107
108 Unlike the existing literature, this study examines the results of CFTR via a
109 multi-level analysis conducted at the national, regional, community and individual levels.
110 This multi-level analysis enables a comprehensive understanding of the connectivity of
111 the social-ecological system, as what happens at one level can affect the result at another
112 level (Young, 2006; Ostrom et al., 2007; Brondizio et al., 2009). As such, the research
113 aims to answer two key questions: 1) What is the actual result of privatization through
114 the CFTR at the national and regional levels?, and 2) What factors affected the tenure
115 reform result, in terms of learning from empirically-grounded analysis at the village and
116 individual household levels? Thus, the central contribution of this research is to provide
117 thoughtful insights into those two questions as additions to the existing literature. The
118 research also makes an empirical contribution to the policy debate on forest devolution
119 and provides timely information to Chinese policymakers for improving the current
120 CFTR policy. The policy implications are also globally relevant.

121

122 **2. China's Collective Forest Tenure Reform (CFTR): A historical overview**

123

124 China's collective forests emerged in the 1950s alongside the establishment of the
125 People's Republic of China, when the government transferred individually-managed
126 forestland to collective management under the communist system (Liu, 2001; Miao and
127 White, 2004). Within the commune system, village cooperatives were established as the
128 forestland holders, and farmers enrolled as cooperative members to secure their access
129 to farmland and forestland (Grinspoon, 2002). This collectivization policy continued
130 throughout the years of the Great Leap Forward and the Cultural Revolution from the
131 mid-1950s to the end of the 1970s. However, the forest collectivization created
132 problems in the form of environmental degradation and slow economic development
133 (e.g. Menzies, 1994; Shapiro, 2001; Grinspoon, 2002).

134

135 Following the success in agricultural privatization, the forestry reform began in 1982
136 with the reallocation of the collective forestland to individual households across the
137 entire nation to ensure the individual use rights to forests (Liu et al., 2019). The reform
138 aimed to promote afforestation and effective forest management to alleviate poverty. As
139 such, the reform attempted to provide incentives to farmers through the "Three Fix"
140 (*Linye shanding*) approach: 1) clarifying forest boundaries, 2) distributing collective
141 non-forested land to rural households (called "Private Freehold Mountain" or *Ziliushan*
142 *自留山*), and 3) introducing the "Responsibility System" to set up "Responsibility
143 Mountain" (*Zerenshan 责任山*) for the collectively-owned forest by using contracts to
144 allow individual forest management (Liu et al., 2019).

145

146 The first tenure reform did not achieve the objective expected by the government and its
147 outcome was less than positive. The rural people's lack of confidence in the security of
148 their tenure meant that the Freehold Mountain allocations did not generate much
149 enthusiasm for tree plantations (He, 2016; Liu et al., 2019). Studies reported a decline in
150 forest areas as market forces and badly-defined tenure arrangements led to many
151 forests under the Responsibility Mountain policy being felled for cash income (e.g. Xu et
152 al., 2005; He, 2012). The overexploitation and short-sighted management of the forests
153 was encouraged by the policy's short periods of tenure and various ambiguities (Ho,
154 2001; Liu et al., 2019). In 1985, a harvest quota system was imposed to halt the rapid
155 cutting of collectively-owned forests, but this policy change again led to tenure
156 insecurity (He, 2016). The central government stopped allocating forest rights to
157 individual households in 1987, and thus titling the forest to the holders was ceased. The
158 problems of the lack of institutional credibility and the uncertain benefits of forest
159 management called for improvements to the forest sector reform policy.

160

161 In 2003, the second round of the CFTR commenced. Learning from the previous reform
162 attempts, the second round paid great attention to forest privatization as part of a

163 broader social and political trend, aiming for privatization of the rural landscape and the
164 establishment of a free market (Xu et al., 2010; He and Sikor, 2017). This reform was
165 originally initiated as a pilot study in Fujian Province, where the provincial government
166 allocated collectively-owned forests to individual households with clarification of the
167 individual households' rights to use and benefit from their forest. This pilot privatization
168 of forest tenure improved the incentive for farmers to invest in their forests. The central
169 government then called for nationwide reform in 2005. In July 2008, a new national
170 policy was officially publicized by the Central Committee of the Communist Party of
171 China and the State Council. Up to the end of 2010, the forest tenure reform had been
172 implemented in 28 provinces involving around 500 million rural forest dependents (Xu
173 et al., 2010).

174

175 The second forest tenure reform emphasized a rights-based approach, differing from the
176 previous reform in its purpose: to ensure meaningful individual rights over forest
177 resources. To ensure the privatization of forests, the key task identified by the
178 government was to clarify and secure farmers' meaningful rights to forest management
179 and securing farmers' ownership of forests and their right to use forestland, with a
180 70-year contract and the forestland remaining under ownership of the collectives (Yin,
181 2014; He and Sikor, 2017). The privatization effort therefore took a form of the
182 government clarifying and securing the farmers' four rights of forest tenure, including:
183 use rights of forestland, management rights of forest and forestland, the right to forest
184 disposal, and the right to benefit financially from the forest (State Council 2008)³. Also,
185 the second reform enabled local autonomy and self-governance in forest redistribution.
186 This reform policy gives village assemblies full decision-making power regarding how
187 much collective forest should be turned over to individual households and how much
188 should remain as a collective resource. The rights to the latter portion remain vested in
189 the democratically-elected village committee. With this, the central government aims to
190 create a meaningful forest decentralization, ensuring local benefits while also meeting
191 the variability in regional needs (He, 2012).

192

193 Although there is goal of promoting local participation and securing local rights to forest
194 resources, the central government has established a range of principles for
195 implementing the forest tenure reform policy that have limited local decision-making⁴.
196 The central government also encourages the privatization of collective forests by
197 defining a percentage of privatization of the total collective forest area as key indicator
198 to evaluate the achievement in each province. At the national level, there is a goal of
199 privatizing 80% of the collective forest in each province. In addition, while the central
200 government has proposed a five-year period for the task of clarifying property rights,

³ The four tenure rights differed from Schlager and Ostrom's bundle of rights (1992), where the Chinese Government emphasized the right to use and benefit from the forest.

⁴ In practice, to meet the high rate of privatization and fast accomplishment of forest titling, the village level plan of reform is mainly implemented in a top-down approach (see also Robbins and Harrell, 2014, He and Sikor 2017).

201 the provincial and local governments are pushing for a shorter period to demonstrate
202 their local capability so they can request further investment from the central
203 government (He and Sikor, 2017). The clash between the state's goal and local practices
204 might cause a mismatch between the national-level intention of securing forest tenure
205 for individual holdings and the local-level preference for more complex tenure
206 arrangements. Thus, there is an urgent need to examine the actual property regime
207 changes through the tenure reform and the local dynamics shaping the implementation
208 of the national tenure reform policy.

209

210 **3. Methodology**

211

212 This research applied a multi-level analysis to examine the outcomes of CFTR, focusing
213 on the changes in property regimes and the local dynamics that have shaped those
214 changes. A combination of qualitative and quantitative methods was applied to generate
215 a robust dataset for providing empirically-grounded and evidence-based results. To
216 achieve this, different methods of data collection were applied at different levels to
217 obtain rich insights into the tenure reform from different perspectives.

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219 **3.1 Data collection**

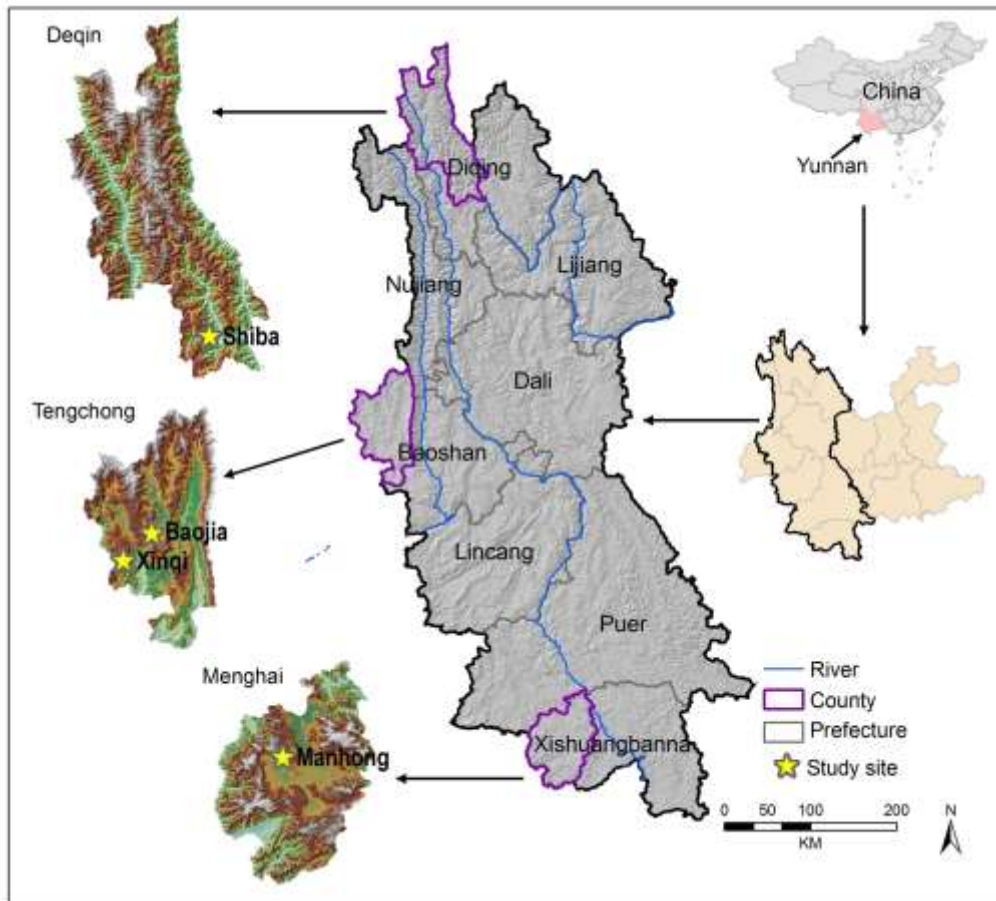
220 First, at the national and the regional levels, the data on changes in forest area under
221 each forest property regime were obtained from three time periods – the 6th
222 (1999-2003), 7th (2004-2009) and 8th (2010-2014) National Forest Inventories carried
223 out by the State Forestry Administration. Through comparison of the forest areas under
224 each property regime, an overall picture of the outcome of the forest privatization was
225 obtained for the entire country as well as the regional variations. As the actual result of
226 privatization from the tenure reform, this provides clear statistics to evidence if the
227 national goal of privatization has been achieved. Additionally, policy documents on the
228 CFTR were investigated to understand the nature of the policy. Progress reports
229 prepared by different levels of the government were reviewed for insights into the
230 process and implementation of the policy change. The study of policy documents and
231 reports from the central and regional levels provided for a sound understanding of the
232 policy's intentions and allowed examination of differences in implementation of the
233 policy at different levels of government. At the national and the regional levels, 12
234 in-depths interviews were conducted with key informants (i.e. government
235 policymakers and forest sector officials) to obtain a deep understanding of the policy
236 and the history and dynamics of the policy's implementation.

237

238 Second, at the village level, as informed by Magliocca et al. (2018), this research applied
239 an in-depth ethnographic approach in four villages in Yunnan Province to provide
240 knowledge of the CFTR using case-studies. These four villages were chosen as
241 illustrators that cover a diversity of biophysical and socioeconomic conditions that are
242 characteristic of rural China. Although these four case-studies are not statistically

243 representative of China as whole, they provide rich insights into the dynamics and
244 diversity of the forest tenure reform. In particular, they help to capture a wide range of
245 factors affecting the results of the reform. The illustrative case-studies represent
246 different ecological zones and different ethnic groups, including Lisu people in the
247 highland alpine zone in Deqin County, Han-Chinese in the uplands of the subtropical
248 zone in Tengchong County, and Dai (Thai) people in the lowland tropical zone in
249 Xishuangbanna Prefecture (Figure 1 and Table 1). Also, the four villages are engaged in
250 different livelihood strategies and farming practices, which lead to different types and
251 levels of forest use and management and different local economic conditions. The
252 village-level case-studies used qualitative data collection to understand the local-level
253 policy implementation processes and responses to the policy. A total of 54 interviews
254 were conducted with key informants, including the village leaders at both the Natural
255 Village and Administrative Village levels⁵, villagers involved in the reform, village elders,
256 and leaders involved with the Village Forest Association. In addition, a total of four focus
257 group discussions were conducted, with each consisting of four to five people and
258 designed to gain deeper insight into the local perspectives of the reform policy's
259 implementation.
260

⁵ Natural Village is a natural settlement of several households ranging from 5-10 households, while several Natural Villages comprises an Administrative Village, which is the lowest administrative unit in the Chinese government structure. The ownership of collective forests can be held at both the Administrative and Natural Village levels.



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262

263 **Figure 1. Locations of the study sites**

Table 1. Biophysical and socioeconomic characteristics of the four case-study villages.

Study site characteristics	Shiba (Deqin County)	Baojia (Tengchong County)	Xinqi (Tengchong County)	Manhong (Xishuangbanna Prefecture)
Geography				
Area (km ²)	202	24.05	53.19	1.91
Elevation (m.a.s.l.)	3300-3800	1782-2506	1692-2546	1255-1500
Socioeconomics				
Ethnicity	Lisu	Han-Chinese	Han-Chinese	Dai (Thai)
Total households (2015)	303	1212	1183	58
Total population (2015)	1091	5180	4577	286
Net income per capita	305(USD, 2015)	1345 (USD, 2015)	1565(USD, 2015)	1367(USD, 2015)
Forestry				
Dominant natural forest vegetation	Pine (<i>Pinus armandii</i> , <i>P. yunnanesis</i>), (<i>Sabina pingii</i> var. <i>wilsonii</i>)	Fir (<i>Taiwania flousiana</i> , <i>Tsuga Dumosa</i>), Pine (<i>P. Armandii</i> , <i>P. yunnanesis</i>), Alder (<i>Alnus nepalensis</i>),	Fir (<i>T. flousiana</i> , <i>T. dumosa</i>), Pine (<i>P. armandii</i> , <i>P. yunnanesis</i>), Alder (<i>A. nepalensis</i>).	Pine (<i>P. kesiya</i>)
Plantation	Walnut (<i>Juglans sigillata</i>)	Walnut (<i>J. sigillata</i>), Fir (<i>T. flousiana</i>), Alder (<i>Alnus spp.</i>), oil tea (<i>Camellia reticulata</i>)	Mixed forests of <i>A. nepalensis</i> , <i>Betula alnoides</i> , <i>T. flousiana</i> , <i>T. dumosa</i>	Bamboo (<i>Dendrocalamus membranaceus</i>)

265

266 Third, at the individual household level, a questionnaire survey was implemented in a
267 face-to-face manner to understand personal perspectives of the underlying factors that
268 have shaped the tenure reform. Using a random sampling strategy⁶, a total of 242
269 farmers were selected in the four villages. The questionnaire focused on individual
270 preferences for the distribution of revenues generated from the collective forest, in line
271 with individualization (as the notion of privatization) and communalization principles of
272 forest management⁷, as adapted from Martin et al. (2019)⁸. The respondents were asked
273 to rank their choices from their most preferred to their least preferred to quantify their
274 priorities among five methods of revenue distribution: 1) prioritizing rewards flowing
275 to those who have contributed most to producing them (Contributor), 2) prioritizing
276 those who experienced losses arising from forest management (Compensation), 3)
277 prioritizing investment to generate public goods in the community (Community), 4)
278 prioritizing poverty alleviation (Pro-poor), and 5) prioritizing an equal distribution of
279 revenues among community members (Equality). The first two priorities refer to
280 meritocratic forms of distribution as an individualization principle, while the remaining
281 three methods reflect the principles of collective action and egalitarianism. Following
282 completion of the structured questionnaire, open-ended questions were asked to
283 elaborate on the respondent's reasons for their choice of preference.

284

285 **3.2 Data analysis**

286 Quantitative and qualitative data analysis was carried out for each of the levels of
287 investigation. At the national and regional levels, the national inventory data was
288 analyzed quantitatively to present descriptive statistics of forest property regime
289 changes across different regions and time periods, while qualitative data generated from
290 the interviews with officials helped to understand the reason for those changes and the
291 stories behind the changes evident in the statistics. At village level, the qualitative data
292 were analyzed to generate insights into the policy implementation process and actual
293 practical outcomes at the local-level, while the quantitative data relating to actual forest
294 holdings and different forest regimes was incorporated to support the qualitative
295 analysis of policy implementation. Finally, at the individual household level, SPSS
296 (Statistic Package for Social Science) software was used to analyze the quantitative data
297 generated from the survey questionnaire. A Chi-square test was performed to examine
298 the significant differences among the different preference choices for forest benefit
299 distribution and use. Qualitative data was presented to help understand the reasons
300 behind those preference choices.

⁶ In each village, a name list of adult villagers provided by the village heads was coded by researchers; then the approximately 60 individuals were selected by a simple random sampling strategy for the questionnaire survey. When the selected person was not available, we interviewed the next person on the name list.

⁷ The emphasis here is to examine preferences about the allocation of benefit from collective forest, which help to obtain insights on individualistic vs. communalist principles among individual farmers. It is not generalized to preferences concerning communal vs. private forest ownership.

⁸ The survey is part of larger project led by the University of East Anglia (UK) entitled "Conservation, Market and Justice: Global and Local Perspectives". The questionnaire used in the survey with English translation can be found in the supplementary materials.

301

302 **4. Results**

303 **4.1 National-level analysis**

304 There were significant changes to China’s forest property regimes alongside the
 305 country’s market liberalization process (Hyde et al., 2003). While private forests firstly
 306 emerged in the country in late 1980s through the Responsibility Forest (*zherenshan*)
 307 and Private Freehold Mountain (*ziliushan*) systems to provide management incentives
 308 for farmers, the most remarkable change occurred with the pilot forest tenure reform in
 309 late 2003 before becoming more nationally widespread in 2008. Table 2 shows the
 310 changes in forest area for the different property regimes in China from 1999-2014. It is
 311 clear that the area of private forests has been an important share of China’s total forest
 312 area since 1999-2003 when it accounted for 21% of the total forest area. Since then, its
 313 portion has continued to increase along with implementation of the CFTR. During the
 314 periods 1999-2003 to 2004-2009, private forests increased from 21% to 32% of China’s
 315 total forested area and then further increased to 44% during the period 2010-2014.
 316 Meanwhile, the collective forest area reduced from 38% to 29% between the sixth and
 317 seventh inventory periods (1999-2003 to 2004-2009) and continued to decline to 18%
 318 during the 2010-2014 period. In contrast, the portion of state forest has remained
 319 relatively stable over the last two decades.

320

321

322 **Table 2. Changes in forest property regimes in China from 1999-2014**

Forest area changes	6 th Inventory: 1999-2003		7 th Inventory: 2004-2009		8 th Inventory: 2010-2014		6th to 7th Inventory		7t to 8th Inventory	
	area	%	area	%	area	%	area	%	area	%
State	70.16	42	71.44	39	72.44	38	1.27	0.70	1.01	0.53
Collective	63.89	38	51.77	29	35.00	18	-12.12	-6.68	-16.77	-8.77
Private	34.96	21	58.18	32	83.73	44	23.21	12.80	25.56	13.37
Total ⁹	169.02	100	181.38	100	191.18	100	12.36	6.82	97941	0.05

323

324 Source: State Forestry Administration, 6th, 7th and 8th National Forest Inventories. Note: Units = million of
 325 hectares (area). The National Forest Inventory is conducted every 5 years and was first conducted from
 326 1973 to 1976. But private forests were first recorded in the sixth inventory. Calculation of changes in the
 327 percentage of forest area under each type of property rights is informed by He et al. (2014)

328

329 Table 2 also shows the percentage of change in forest area over time for the different
 330 property regimes. From the 6th to the 7th inventory, the private forest area increased by
 331 12.8% of the total forested area, while the collective forest area decreased by 6.68%.

⁹ The share of forest to the total land area in China was 17.61% in the 6th inventory, 18.89% in the 7th inventory and 19.91 % in the 8th inventory. But this number is different from forest coverage, which includes any form of tree cover with a canopy greater than 20%, such as trees on farms and roadside trees.

332 Similar patterns can be found from the 7th to the 8th inventory. Across the time period
333 from 1999-2014, the collective forest area decreased from around 63 million ha to 35
334 million ha (a decrease of around 28 million ha), while the private forest area increased
335 from 34 million ha to 83 million ha (an increase of around 49 million ha). However, the
336 decrease in the collective forests only accounted for 44.44 % of the total collective forest
337 area from 1999 to 2014, which is far less than the national goal of 80% privatization. It
338 is also noted that from Table 2, one cannot simply conclude that all the increases in
339 private forest have resulted from the CFTR. Indeed, the increase in the private forest
340 area is a result of nationwide afforestation programs, particularly the Sloping Land
341 Conversion Program (SLCP). This program has converted approximately 8 million ha of
342 cropland to forest, and this forest has been registered as private forest, thereby
343 contributing to the increase in the private forest area at both the national and local
344 levels (SFA, 2016).

345

346 In sum, at the national level, forest privatization implemented through the tenure
347 reform was much less than what government expected, as shown in national forest
348 inventory datasets. Thus, a large portion of the collective forest area remains under
349 communal management. Although forest officials realize the blanket approach to forest
350 privatization cannot work well given the diversity of China, they continue to push for
351 forest privatization across the country to meet the national target. As a result, they have
352 begun to allow some types of communal forest to be regarded as privatized forest. This
353 is further discussed below.

354

355 **4.2 Regional-level analysis**

356 Figure 2 shows the changes in forest area for the different property regimes from
357 1999 to 2014 across four regions of China, namely the Northeast, Southwest, South and
358 the Three-North regions. It also shows there has been an increase in the percentage of
359 the private forest area in all regions except the Northeast Region which has long been
360 dominated by a state forest enterprise that manages the forest to supply national timber
361 needs. In the other regions, we can see a clear decrease in the share of the collective and
362 state forests and an increase in the share of the private forest.

363

364 In the Southwest Region, the marked decrease in the collective forest area occurred
365 after the CFTR was officially implemented in 2008. This region's share of collective
366 forest decreased from 33% in 2004-2009 to 18% in 2010-2014, while the private forest
367 area increased from 21% to 37% over the same time period. In the South Region, the
368 increase in the share of the private forest was greater between 1999-2003 and
369 2004-2009 than between 2004-2009 to 2010-2014. This was because the tenure reform
370 was firstly piloted in this region. In the Three-North Region, the share of the private
371 forest area was increased across the three inventory time periods. Thus, it is evident
372 that the effects of the Collective Forest Tenure Reform have varied across time and

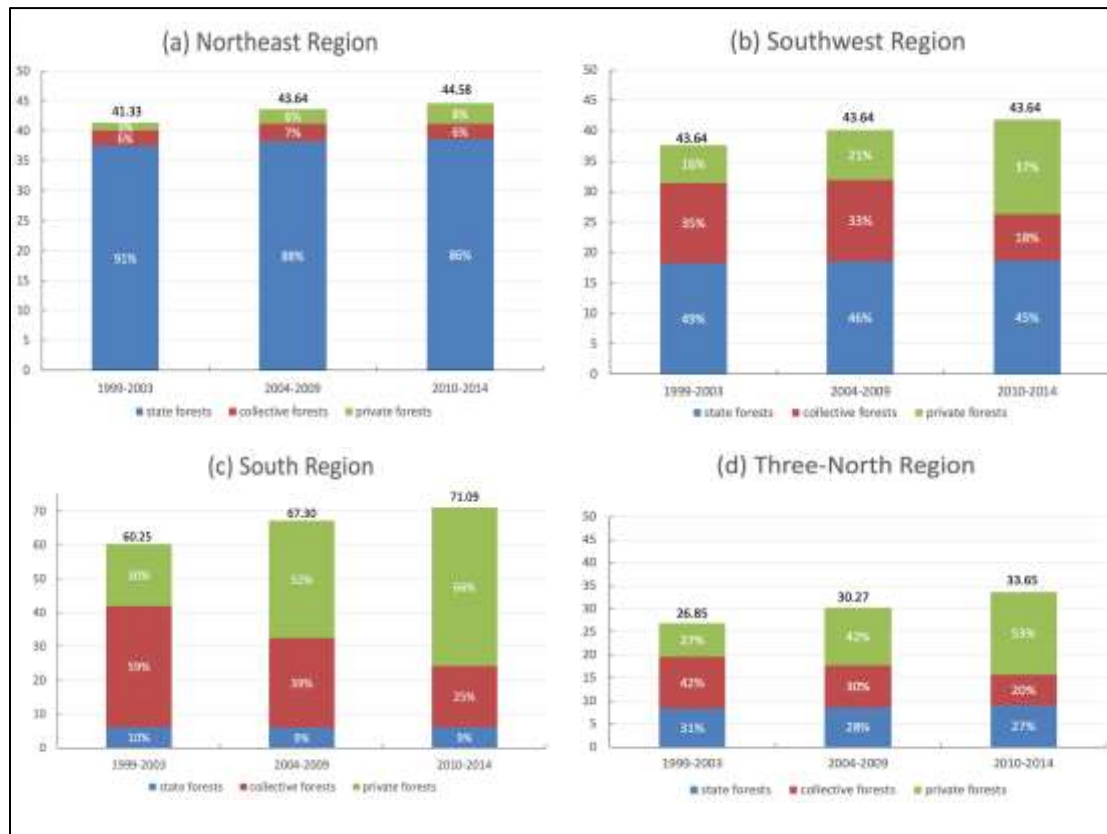
373 across different regions, in line with the varying times of implementation of the reform
 374 across the different regions.

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376

377

Figure 2. Changes in forest property regimes across four regions of China



378

379 Source: State Forestry Administration, 6th National Forest Inventory (1999-2003), 7th National Forestry
 380 Inventory (2004-2009), 8th National Forest Inventory (2010-2014).

381 Note: Unit=million ha. The four forest regions were officially classified to include the following provinces: a)

382 Northeast = Heilongjiang, Jilin and Inner Mongolia; b) Southwest = Sichuan (Chongqing included), Yunnan,

383 and Tibet; c) South = Anhui, Zhejiang, Fujian, Jiangxi, Hunan, Hubei, Guangdong, Guangxi, Hainan, and

384 Guizhou; d) Three-North = Liaoning, Hebei, Beijing, Tianjin, Shandong, Jiangsu, Shanghai, Shanxi, Henan,

385 Shaanxi, Ningxia, Gansu, Qinghai, and Xinjiang.

386

387 Figure 2, however, only tells part of the forest regime change story. Although the

388 national-level analysis notes the increase in the private forest area derived from the

389 SLCP, the actual allocation of collective forest is in question at the regional level, as in

390 many cases, the forest privatization only appears on paper. He and Sikor (2017) report

391 that the local government in Yunnan Province has included unallocated ecological

392 forest¹⁰ as privatized forest to meet the high national requirement (i.e. 80%) for

¹⁰ Forest in China has been classified as two types according to the purpose of use: 1) economic forests that include fruit trees and timber forest that can be cut for commercial purposes, and 2) ecological forest that refers to the forest areas that are protected for ecological functions and public goods (i.e. ecosystem services).

393 privatization. The local government's argument for doing so is that privatization cannot
394 be implemented in ecological forests, as a private holding can mean the loss of
395 government control, which could lead to a degradation of ecosystem services from these
396 critical areas. This practice had been approved by the central government and applied to
397 the entire Southwest Region which contains the largest area of ecological forest in China.
398 Zinda and Zhang (2018) also found that in Deqin Prefecture in the Southwest Region,
399 forests that are jointly held by several households have been regarded as privatized
400 forest. In a number of these cases, the jointly-held forests cover large areas and involve
401 over 20 households or a whole natural village. In the provinces of Jiangxi, Zhejiang and
402 Fujian, scholars have also found forest have been reported as privatized (as individual
403 holdings) when they are actually jointly-held collective forests (e.g. Shen et al., 2009).
404 Also, de facto local re-collectivization of privatized forest has taken place in Jiangxi
405 Province to ensure collective action after implementation of the reform (Luo et al., 2015;
406 Liu and Ravenscroft, 2016). As many interviewed forest officials stated, the joint-holding
407 is actually a form of communal forest management, but has been reported as privatized
408 forest to ensure regions meet the national privatization goal. These officials also imply
409 that including ecological forest as privatized forest also contributes to the meeting of the
410 national requirement.

411

412 In sum, while statistics show privatization of collective forest has increased in many
413 regions, there is a large difference between the area of forest that has actually been
414 privatized and that which is being reported. Current state statistics includes jointly-held
415 forests and collectively-held ecological forest, which has led to overestimates of the
416 forest privatization. In addition, there has been an increase in collective actions and
417 re-collectivization to retain communal forest management (Liu and Ravenscroft, 2016),
418 which also makes the reported private forest much greater than the reality. Therefore,
419 the reported increase in the private forest area is not at the absolute expense of a
420 decrease in the collective forest. The national goal of privatization of the collective forest
421 area has clearly led to large regional-level variations in implementation.

422

423 **4.3 Illustrative case-studies**

424 The case-studies were conducted in four selected villages in Yunnan Province. The
425 community-level analysis was conducted in these villages to understand how different
426 villages have responded to the forest tenure reform and the outcomes of the reform in
427 term of the changes in forest holdings. At the local-level, the significance of forest tenure
428 lies not only in the allocation of forest management responsibility but also in the
429 allocation of economic benefits secured from that forest. For example,
430 collectively-managed land can involve different forms of benefit sharing including
431 greater and lesser forms of individualization. For this reason, we explored preferences
432 for collective (vs. private forest management) by using non-structured interviews and
433 the preferences concerning different forms of benefit distribution, in addition, by using
434 structured questions. The latter preference was explored through the individual

435 household-level analysis. This focus on distribution preferences also provides us with
 436 further insights into the factors shaped the tenure reform in the case-study villages. Also,
 437 we intend to use both the community and individual household levels of analysis from
 438 the empirically-grounded case-studies as illustrators to show the local contexts and
 439 variations in the CFTR, with a particular focus on local dynamics and local preferences
 440 for tenure arrangements and senses of communality and individuality.

441

442 **4.3.1 Community-level analysis**

443 All four villages implemented the CFTR between 2007 and 2008, when, as per the policy,
 444 they were required to allocate collectively-held forests to individual households.
 445 However, there is still a large portion of village-level forest that remains
 446 collectively-owned forest. As Table 3 shows, over 75% of the village-level forest remains
 447 as collective holdings. Each village has responded to the CFTR differently to retain the
 448 collective holding, although the provincial government intended to achieve 95%
 449 privatization of the collective forest¹¹.

450

451 **Table 3. Forest tenure and holders in the four case-study villages**

Village	Form of tenure and holder	Area (ha)	%
Xinqi	Collective forest held by the Administrative Village	1650	60
	Shareholding forest held by the Natural Village	339	12
	Individual holdings	784	28
Baojia	Collective forest held by the Administrative Village	1371	83
	Individual holdings	280	17
Shiba	Collective forest held by the Administrative Village	5980.2	100
Manhong	Collective forest held by the Administrative Village	78.4	100

452

Source: data obtained in 2016 from Forest Departments in Baoshan, Xishuangbanna and Deqin.

453

454 In Xinqi, farmers have a long tradition of communal forest management, following their
 455 establishment of the first forest farm for collective management in the 1960s. Later, the
 456 collectively-managed forest farm was expanded to 15 forest farms, which now include
 457 more than 2000 ha of collective forest. The revenue from the collective forest
 458 contributes significantly to public infrastructure including for road construction and
 459 school buildings. After implementation of the forest tenure reform, Xinqi has retained
 460 three types of forest holdings, as shown in Table 3: 1) the collective forest owned by the
 461 Administrative Village, which accounts for about 60% of the total forest area, 2) Natural
 462 Village collective forest through a shareholding system that accounts for 12% of the
 463 total forest area, and 3) the individual forests held by private households that account
 464 for 28% of the total forest area. As the provincial government has aimed for a 95%
 465 privatization rate, the village head of Xinqi had to go the County Forest Department to

¹¹ The provincial government aimed for a higher percentage of privatization than the national goal to show their capability to the central government.

466 negotiate with the vice-director to give them an exception for keeping the large area of
467 collective forest.

468 “I used three arguments to persuade the director to approve our case.
469 First, I said: “According to the policy, once two-thirds of the villagers
470 approve the plan we have to follow this collective decision based on
471 the Village Autonomy Law [Village Organic Law]. Second, collective
472 management of the forest has greatly benefited the local economy and
473 the village so that we do not require external money for road
474 construction, school-building and so forth. We should keep this
475 collective forest. Third, we have had bad experiences in the past with
476 allocated forest being rapidly cleared. For its ecological function and
477 economic reasons, we need to keep the collective forest.” [Interviewed
478 in Xinqi on 13 April, 2011]

479

480 In Baojia, following redistribution of forests during the 1980s, there was large-scale
481 deforestation. Many farmers stated this was because the forest tenure reform in the
482 1980s did not provide a clear duration for the forest holding contracts. Many people
483 were afraid the government would take back the forest, and this uncertainty caused
484 many villagers to cut the trees for timber. The village head then asked to be able to
485 re-collectivize their forest for communal management to avoid the deforestation and
486 also to carry out collective reforestation efforts. Many years later, the forest is
487 recovering well, and this has been supported by the communal management. In 2000,
488 Baojia’s forests were designated as a national park for developing ecotourism, as the
489 forest grows in a volcanic area. Therefore, when the CFTR was carried out in Baojia,
490 there was little redistribution of the forest, as there was a community desire to retain
491 the traditional communal management to strengthen their bargaining power with the
492 tourist company when seeking compensation. Also, the village communal management
493 was seen to help the community better protect the forest. The perception of one farmer
494 about the collective management approach is outlined below:

495

496 “If we allocate the forest to individuals, the tourist company will come
497 to deal with individuals one by one with a lower price. If the forest is
498 collective forest, they have to deal with us as a whole. Any agreement
499 has to get approval by over 2/3 of the villagers. So we have more
500 power to negotiate with the company.” [Interviewed in Baojia on 20
501 April 2014]

502

503 In Shiba, although the Lisu people own large areas of the forest, the forest has never
504 been distributed to individual households since the founding of the People’s Republic of
505 China. Situated in Deqin County, Shiba used to be part of a major logging area, due to
506 the region’s high forest coverage and quality timber. Since 1998, the Natural Forest
507 Protection Program (known as the ‘logging ban’) has been implemented to protect the

508 upper watershed of the Yangtze River. Along with implementation of the logging ban,
509 the people's livelihoods have shifted from being timber-oriented to diversified strategies
510 that include ecotourism and non-wood forest products. Now, the people of Shiba are
511 particularly reliant on the commercial collection of Matsutake mushrooms, which often
512 make up to 80% of the household's cash income. The mushroom resource is managed as
513 common property that allows for the inclusive access for all village members. Given the
514 significant proportion of income that the mushrooms provide for households, the
515 villagers were not willing to allocate the forest to individual households, as the
516 mushroom is unequally distributed throughout the forest. This was discussed by one
517 villager:

518 "we cannot allocate the forest to individual households. Otherwise, we
519 will have conflict in mushroom collection, as the mushroom is
520 traditionally collected in our communal forest. The allocation of forest
521 to individual household will make somebody's forest had abundance of
522 mushroom production, and others may have none. That will definitely
523 cause conflict. So, the allocation cannot be practically carried out, as
524 the agreement for forest allocation will be never made." [interviewed
525 in Shiba on 1 May, 2015]

526

527 Manhong, a village of the Dai ethnic minority in Xishuangbanna Prefecture, is a small
528 village with only 78.3 ha of forest. Despite this small area, the forest is of significant
529 cultural importance to the villagers as it is considered a sacred forest in accordance with
530 their religious customs. The sacred forest is therefore traditionally protected as a
531 cultural landscape where only ritual activities can be carried out. Thus, the forest
532 provides cultural services to the whole community and is collectively managed by the
533 community members. The sacred forest is also located in an upper watershed, which
534 means it provides important environmental services to the downstream Dai people who
535 cultivate rice paddies in the valleys. Thus, the village prefers to keep the forest as a
536 communally-managed resource to protect the cultural and environmental values of the
537 small watershed, as described by one villager:

538 "The Long Shan (the sacred forest) cannot be allocated. It is the forest
539 where our ancestors and god live..... it belongs to the whole community,
540 and cannot be distributed to households.....[this] forest is small area,
541 but it is our watershed forest, it provide water supply. We are afraid
542 the forest allocation will lead to forest degradation and water shortage."
543 [Interviewed in Manhong on 20 January, 2016]

544

545 In sum, the different villages have different reasons for retaining significant proportions
546 of the collective forest for communal management. At the community level, the revenues
547 generated from the collective forests can make significant contributions to the village
548 economy and be used for needed public infrastructure or other community-based
549 investments, as evident in Xinqi. In Baojia, the village has retained the collective forest to

550 enhance their bargaining power when dealing with other stakeholders. In Shiba, the
 551 collectively-owned forest provides provisional services for the collection of non-wood
 552 forest products (particularly Matsutake mushrooms) that are an important basis of
 553 alternative livelihoods. This communal forest management approach also avoids
 554 potential community conflict due to the uneven distribution of mushrooms throughout
 555 the forest. In Manhong, the collective forest is of high importance for the local people for
 556 cultural reasons and to protect their watershed, meaning they believe the forest cannot
 557 be privatized. And in Manhong and Shiba in particular, it is ultimately the spatial
 558 indivisibility of benefits that makes privatization a poor fit with the community's needs.
 559 Thus, these community's ecological, economic and cultural considerations mean that
 560 forest privatization might not be an appropriate match with their needs.

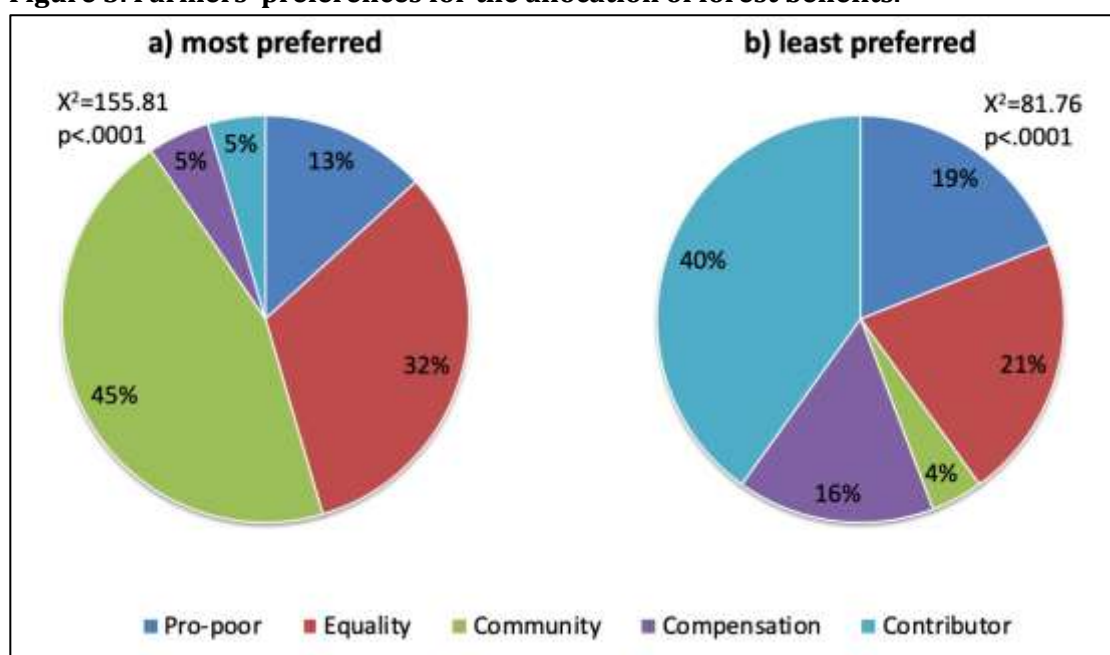
561

562 4.3.2 Individual household-level of analysis

563 The national-level and regional-level analyses show a strong national push towards
 564 forest privatization that is being unevenly realized across the regions. The village-level
 565 cases reveal diverse reasons why some communities are resisting privatization. The
 566 resistance is dependent on particular place-based social and economic characteristics
 567 such as local histories of collective management, the presence of a valuable but unevenly
 568 distributed non-wood resource, or the present need to negotiate with a more powerful
 569 land-use stakeholder. In this section, to understand the underlying reasons behind the
 570 resistance to privatization at an individual household level, we examine farmer's
 571 perceptions within the villages by exploring their preferences for revenue allocation
 572 from collective forests. In particular, we are interested in whether respondents favor
 573 methods of distribution in line with the principles of individualization versus
 574 communalization.

575

576 **Figure 3. Farmers' preferences for the allocation of forest benefits.**



577

578 Source: village survey 2015-2016; note: n=242.

579

580 As Figure 3 (a) shows, the most popular preference for benefit distribution is to use the
581 forest-based revenue for community purposes or public goods. This preference was
582 noted by 45% of the 242 interviewees. The 'Equality' option was preferred by 32%, the
583 'Pro-poor' by 13%, and the 'Contributor' and 'Compensation' options were both
584 preferred by 5% of the interviewees. The Chi-square testing among the group of most
585 preferred benefit distribution options shows its significant level at $p < 0.0001$
586 (Chi-square=155.81, $df=4$). Both the 'Contributor' and 'Compensation' options represent
587 forms of individualization of benefits based on individual deservedness – the former
588 based on reward for effort, the latter based on opportunity cost. Together, these
589 preferences for individualization of benefit distribution amount to only 10% of
590 preferences. On the other hand, Figure 3 (b) shows that most (40%) of the interviewees
591 chose 'Contributor' as their least preferred option, while 16% chose 'Compensation'. The
592 selection of 'Community' and 'Pro-poor' account for 4% and 19% respectively. The
593 chi-square testing among the group of least preference shows its statistically significant
594 level at $p < 0.001$ (Chi-square=81.76, $df=4$).

595

596 The results presented in Figure 3 show a strong desire by individual farmers for the
597 communal principle rather than the individualization principle as the basis for
598 forest-based revenue allocation. Farmers consider that communal forest management
599 can contribute to the effectiveness and efficiency of forest management for improving
600 forest quality as well as for community-based public goods. This was evident in a
601 number of farmers' statements, like the ones presented below:

602

603 "It is not a good idea to allocate many forest to individual. That will
604 become a fragmentation of forest holding. Individual smallholders
605 cannot manage the forest effectively and efficiently. So they cannot
606 achieve economics of scale of management. Then, it would be high cost
607 for us and our forest quality will get bad." [Interviewed in Xinqi on 10
608 Feb. 2012]

609

610 "...we can only protect the forest collectively that we can have good
611 environment [habitat] for mushroom grows, that will benefit all the
612 communities." [interviewed in Shiba on 5 May, 2015]

613

614 Villagers also discussed the social justice dimension for communal forest management,
615 which they consider privatization cannot meet:

616

617 "We use those money [revenues from collective forest] as matching
618 fund from national fund for infrastructure development, like road and
619 water pipes in our village. I think this is more fair to get everybody

620 have equal benefit from these money [from the collective forest]. We
621 had very bad experiences when we have to collect money from each
622 household for building the village road. Some villagers may contribute
623 money, some villagers may not. That is really unfair, as the road is built
624 for publics.” [Interviewed in Baojia on 26 April, 2015]

625
626 “we use those revenues (from the collective forest) as public fund for
627 public goods. We build temples, clinic, school and roads by using
628 revenues from the timber harvest [in the collective forest]. We also buy
629 the health insurance to everybody by using those revenues. We think
630 this is more fair, as everybody need walk on those road, send kids to
631 school, go to clinic.” [Interviewed in Xinqi on 2nd March, 2016]

632
633 In sum, farmers preference to retain collectively-owned forest for communal
634 management for reasons of forest management effectiveness and efficiency and
635 ensuring all the village members benefit from management of the forests. The
636 communal management of forests was also chosen by the local people from a justice
637 perspective, with the belief that privatization of forest management will not deliver this
638 important outcome. The basis of the farmers’ resistance to forest privatization and their
639 preferences for local collective action includes the history of the community, the need to
640 retain their bargaining power with other stakeholders, concerns about the potential for
641 uneven distribution of resources and benefits, and community-based cultural beliefs and
642 needs. As such, the principle of forest privatization has been rejected by individual
643 farmers interviewed in this study.

644

645 **5. Discussion and Conclusions**

646 The Chinese government has made a substantial investment in improving its forest
647 tenure system via a privatization approach to increase the allocation of individual
648 holdings from the collectively-owned forest resource. While the government believes
649 this reform can improve the local incentive for forest management through an equal
650 distribution of the collective forest resource, the on-ground results appear very different
651 to the government’s intention. Differing from existing literature, this research provides
652 thoughtful insights into China’s CFTR by using a multi-level analysis of the reform. As
653 the study has indicated, far less privatization of forest than what the government
654 expected has actually occurred. The theoretical and empirical implications drawn from
655 this research lie in four aspects.

656

657 First, this research reveals the gap between government intentions and local
658 practices occurred when pre-existing local contexts were ignored in devolution reform
659 of forest tenure systems. While there can be a willingness from state authorities to
660 provide more rights to local people and communities, local contexts can shape the
661 reform and lead to unexpected results that widely differ from the state’s intentions. In

662 the case of China, the central government has considered privatization of forests to be
663 the best approach for improving the country's forest tenure system and resource
664 security. However, as this research shows (based on analyses of national-level and
665 regional-level datasets), when the state pushed for large-scale privatization, only about
666 44% of their proposed allocation of collective forest to individuals was implemented¹².
667 Also, while there is much forest privatization recorded on paper, communal
668 management remains common in practice (He and Sikor, 2017; Zinda and Zhang, 2018).
669 Studies from elsewhere also show that when states push for tenure reforms, there can
670 be a range of unexpected outcomes including communalization, conflict and forest
671 degradation, particularly when states ignore pre-existing local contexts and apply a
672 top-down implementation of policies (e.g. Lane, 2003; Guneau and Tozzi, 2008, Sikor et
673 al., 2017; Robinson et al., 2014; Gebara, 2018). In China, where state policies are usually
674 top-down implemented, there is a need for the government to better understand and
675 respond to local needs and contexts.

676

677 Second, this research suggests that local preferences for tenure arrangements are
678 very complicated and can greatly differ from simple privatization. In many cases, the
679 local communities might want to retain their traditional communal (and complex)
680 tenure system, instead of seeking private property rights (e.g. Haenn, 2006; Perramond,
681 2008; Cellarius, 2011). As shown in this research, local customary arrangements for
682 commons interests, cultural needs, and emerging values of non-wood forest product
683 collection and ecotourism development can form different and complicated tenure
684 arrangements for communal use of forest resources. Individual considerations of
685 communality are embedded within community needs and individual preferences. Thus,
686 the state's understanding of egalitarian forest distribution via privatization may not
687 match local preferences. In Xinqi, people believe communal forest use rather than
688 privatization could better contribute to public goods through a fair distribution of forest
689 benefits, while in Shiba, there is a desire to retain the communal forest holding system
690 to enable the equal access to valuable mushrooms. These examples reflect complex local
691 perspectives of equality in forest tenure reforms. In Baojia, the community wish to
692 retain the communal forest to strengthen their bargaining power when they confront
693 external powerful actors like tourism companies, while cultural services are a more
694 important reason for Manhong village's desire to retain the traditional communal forest
695 management system. Thus, as suggested in existing literature, improving the tenure
696 arrangement cannot rely on titling programs alone. Of greater importance is
697 incorporating local preferences by empowering local communities to play a role in the
698 tenure reform decision-making (Robinson et al., 2018).

699

700 Third, this research has suggested that communal management of forest resources
701 supports less conflict when there is emerging diversification of forest property rights,

¹² But there are also cases where the rate of privatization was larger than the case shown in this research, being in Fujian and Zhejiang provinces, where there is strong local preference for privatization, as noted by Qin et al. (2013), Liu et al. (2017) and Li et al. (2016).

702 because communal systems are more embedded in the local contexts and
703 social-ecological systems. Globally, there is currently emerging diversification of forest
704 property rights that goes beyond the rights to forestland and timber (Sikor et al., 2017).
705 For example, the increasing value of non-wood forest products, monetary benefits being
706 derived from environmental services, and cultural ecosystem services requiring the
707 forest to be managed in a form of communal management (e.g. Yang et al., 2009; He et al.
708 2014; Mujawamariya and Burger, 2016). Forest titling programs for privatization may
709 not fit those complexities. Communal forest management therefore would allow an
710 inclusive and equal access to the forest and forest benefits, while privatization might
711 lead to potential conflict in forest-dependent communities. In most forest tenure
712 reforms, there is a separation of forestland and timber from other provisional,
713 environmental and cultural services, which could be problematic. Instead, there is a
714 need for a holistic understanding of the local social-ecological system in tenure
715 arrangements to meet local complexities and adaptabilities in tenure reforms.

716

717 Finally, the specificities in the case of China drawn from this research call for
718 discussion about the effectiveness, efficiency and justice from local conceptions of forest
719 management. While dominant thinking from economists is that privatization of forests
720 will lead to forest management cost-effectiveness and efficiencies, the individual-level
721 analysis presented in this research suggests local perceptions can be different. Rather,
722 the local perception of effectiveness and efficiency is locally- and culturally-embedded
723 into variations of social-ecological conditions, which might include the consideration of
724 forest fragmentation, uneven resource distribution, public goods and cultural needs.
725 These perceptions formed the basis of a unique consideration of justice, which differs
726 from the market economy perception of privatization. Research and policy are thus
727 required to incorporate local perceptions and recognize the local differences in
728 preferences for community-based forest management (Martin et al., 2017).

729

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738

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