

Collective Forest Tenure Reform in China:

Outcomes and Implications

by

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Abstract

In this paper, we review the evolution of the collective forest tenure system in rural China. Using data collected in eight provinces, we analyze the driving forces and outcomes of recent tenure changes. Preliminary results on changes in farmer household income and forest investment following the tenure reform are examined. The implications of tenure reform on forest regulations are also discussed.

I. History of Forest Tenure Reform

Forest tenure reform in the early 1980s

There are basically two types of forestland ownership within China's forest sector: state ownership and collective ownership. This fundamental institutional setting has not changed since late 1950s when China collectivized all land in rural areas. Administrative villages, usually comprised of a number of natural villages (or clusters of villager families), function as the legal owners of collective forests in the majority cases of rural China. Collective and household management within the villages remain the primary form of operation. However, under the current regulations, all types of economic entities have the right to manage and use a collectively-owned forest if properly contracted.

Forest tenure reform in rural China began in the early 1980s, when agricultural land tenure reform was being implemented across China. The essential element of the tenure reform, in both agriculture and in forestry, was to give farmers user rights on collectively owned land. It is widely accepted that the reform of agricultural land tenure was largely successful. In 1984, just three years after the agricultural land reform was fully implemented, the Chinese government declared self-sufficiency in food production. However, despite being posited on the same principles as agricultural reform, the reform of collective forest areas has received mixed evaluations.

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The “Three Fixes” Policy

In March 1981, the State Council issued its “Resolution on Issues Concerning Forest Protection and Development”, also known as the “Three Fixes” policy. This marked the beginning of a long legislative and policy process aimed at encouraging private sector participation by granting increasingly strong user rights to individual farmers. The “Three Fixes” policy sought to transfer responsibility, and subsequently the benefits, of forest planting and management to farmers by:

- Clarifying rights to forests, with an emphasis on mountainous areas;
- Delimiting private plots; and
- Establishing a forestry production responsibility system.

The primary objective of the policy was to establish the farmer household as a legal and basic management unit for forestlands under village collective ownership. From the goals established by the reform policy, two types of individual (household) management models were recognized in addition to the traditional collective management. One was private plots and the other was responsibility plots. For the latter, and in some places for both, farmers were required to sign contracts with their village council in order to obtain user rights for forestland. By 1986, when the “Three Fixes” policy was considered fully implemented, nearly 70% of the collectively-owned forestland had been transferred to rural household management (table 1).

Table 1: Collective Forestland under Household Management by 1986

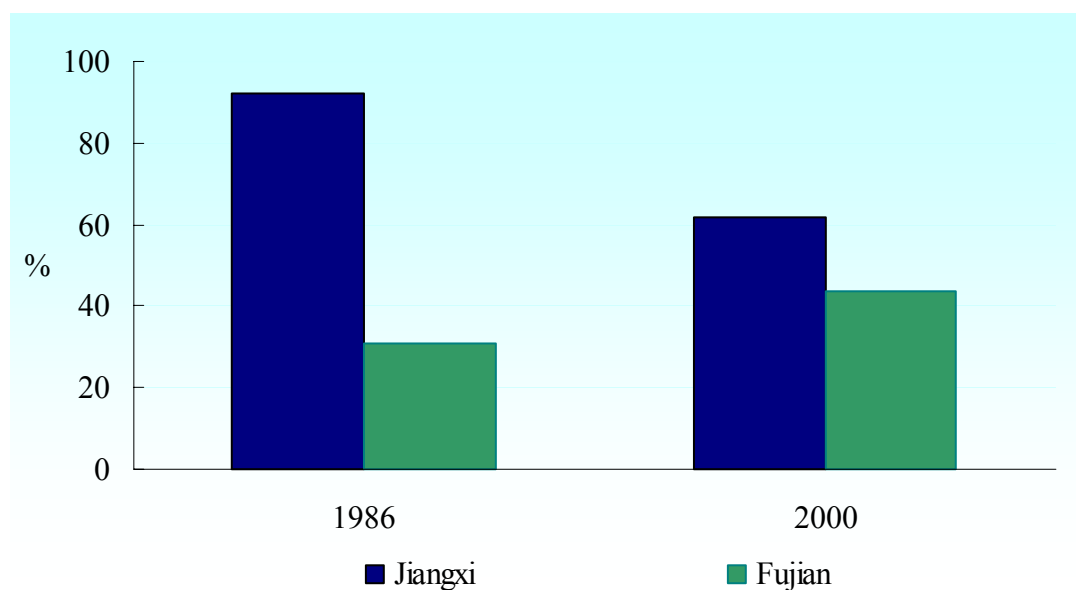
Province	Area of Collective forestland (million ha)	Area of households managed forestland (million ha)	Household managed forests (%)
Zhejiang	5.73	4.37	76
Anhui	3.79	2.8	74
Fujian	8.19	2.65	32
Jiangxi	9.27	8.58	92
Hubei	7.04	5.75	82
Hunan	11.14	8.33	75
Guangdong	9.27	8.17	88
Yunnan	20.31	11.17	55
Total	74.76	51.81	69

Source: China Forestry Year Book (CFYB, 1987), China Forestry Publishing House.

The reform in collective forests served largely as an equalizer of opportunity and welfare between farmers living in heavily afforested areas and those in standard agricultural areas. In 1985, shortly after tenure reform was initiated, the government

liberalized the timber market². The liberalization of the timber market from heavy regulation, and the tenure reform that provided farmers with legal access to forest resources has often been blamed for the widely observed deforestation in some provinces in south China (CCCCP&SC 1987, SFA 2000). Because of the allegations of unsustainable logging, in 1987, the government reinstated monopolistic control by local timber companies over the timber market. Furthermore, in many regions the pace of forest tenure reform was also reined in, as depicted in Figure 1.

Figure 1: Share of Household Contracts in Fujian and Jiangxi, 1986 and 2000



Source: 1986 data comes from China Forestry Year Book (CFYB, 1987), China Forestry Publishing House. 2000 data comes from the survey conducted in 2006.

In figure 1, the 1986 data comes from table 1, and the 2000 data comes from our survey conducted in 2006. Since the survey and data collection methodologies were different, we can only make qualitative comparisons. According to table 1, we can see that in the early 1980s Fujian had the lowest number of hectares designated for farmer household management. In contrast to most other provinces with large areas of collective forests, the share of forestland managed by households of was merely one third; between 1986 and 2000, this share grew only to 40 percent.

In contrast, Jiangxi was more successful province in implementing the “Three Fixes” policy in the early 1980s. By the end of 1986, forest areas under household

²Central Committee of Chinese Communist Party and State Council (CCCCP&SC), “Ten Policies to Further Activate Rural Economy by Central Committee of Chinese Communist Party and the State Council”, January 1, 1985.

management constituted 92 percent of collectively owned forest areas. The government decision to re-monopolize the timber market and strengthen forest regulation presented a setback for the reforms and expansion of household based forest management scheme. Our statistics (table 1 and figure 1) show that the share of household-managed forests dropped to 60 percent in Jiangxi.

Fujian and Jiangxi: Main issues and the reform initiatives in the early 2000s

The essential goal of the shareholding system implemented in Fujian was to keep forests under collective management while distributing “paper shares” of collective forests based on family population³. At that time, this system was highly regarded by forest administrators for its ability to protect forest resources against dramatic deforestation.

Fifteen years after Fujian’s shareholding system was established, two issues became increasingly evident. First, forestry’s contribution to rural incomes was negligible in spite of the fact that forestland occupies more than 60% of the total provincial land area⁴. Second, enforcing forest conservation had become increasingly difficult for local forest authorities due to a lack of cooperation among farmers. As a stylized example, the severity of forest fire incidents grew over the course of the 1990s. There is anecdotal evidence that many of the fires were caused by farmers (Su 2007).

Jiangxi, which borders Fujian, has not fared much better. Over the course of the 1980s, the province’s forest tenure system underwent dramatic changes that resulted in tenure insecurity for farmers. Furthermore, even for the 60 percent of forested area reportedly under household management, many people have pointed out that de facto control was held by natural villages. These collective forest areas shared the same low levels of revenue derived from forestry activities and increasing fire incidents as in Fujian Province.

Table 2 summarizes the composition of farmers’ income in Fujian and Jiangxi; figures 2 and 3 indicate the number and magnitude of fire incidents from 1990 to 2002 in these two provinces. The figures in table 2 indicate that in 2000, the share of forestry in farmer household net income was only 7.47 percent in Fujian and 2.66 percent in Jiangxi. We can see from figure 2 and 3 that issues of forest fires became increasingly serious problems all the way to the times when tenure reform commenced in these two provinces.

³ This seems to be a popular tenure choice in some former Soviet Union and East European Countries in their land tenure reform process, see Lerman (1999).

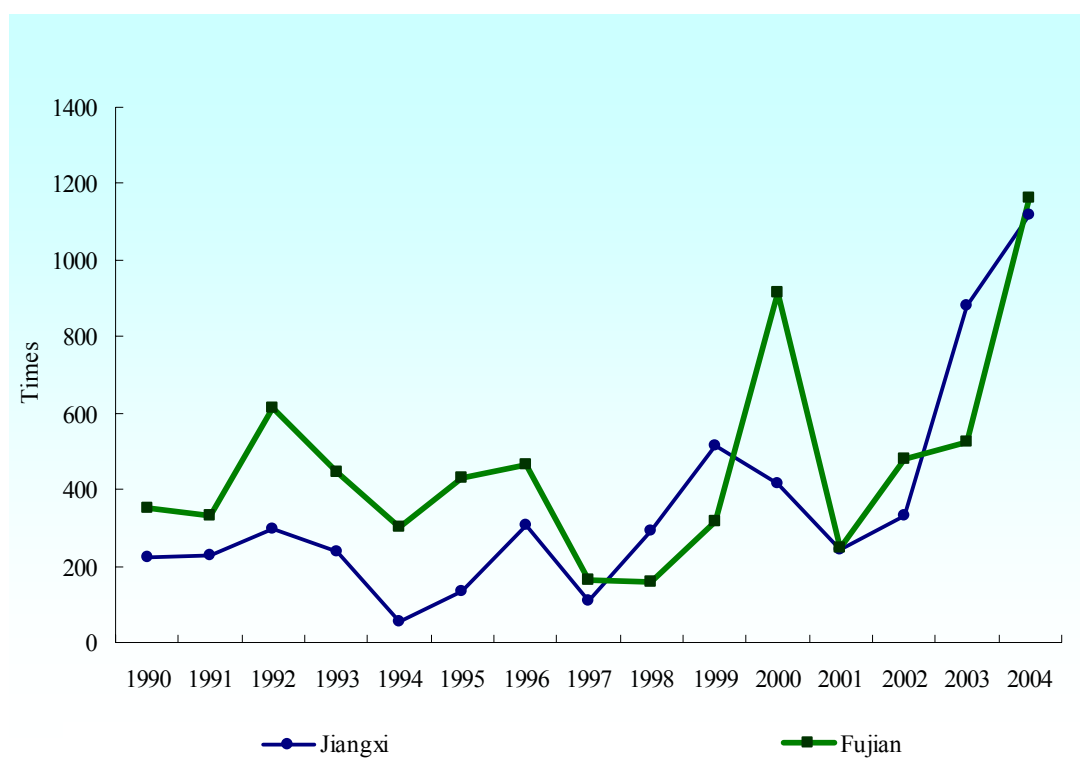
⁴ Su (2007) reported a typical case in Hongtian Village, where in one decade and a half of shareholding management, each household was only given one payment of RMB 21.

Table 2: Farmers' Income Composition in Fujian and Jiangxi, 2000

Region	Income Sources	Yuan	%
Fujian	Forest	685.29	7.47
	Agricultural	3054.99	33.30
	non_Agricultural	4759.07	51.88
	Others	674.02	7.35
	Total	9173.37	100.00
Jiangxi	Forest	188.29	2.66
	Agricultural	2641.64	37.34
	non_Agricultural	3873.22	54.75
	Others	371.42	5.25
	Total	7074.57	100.00

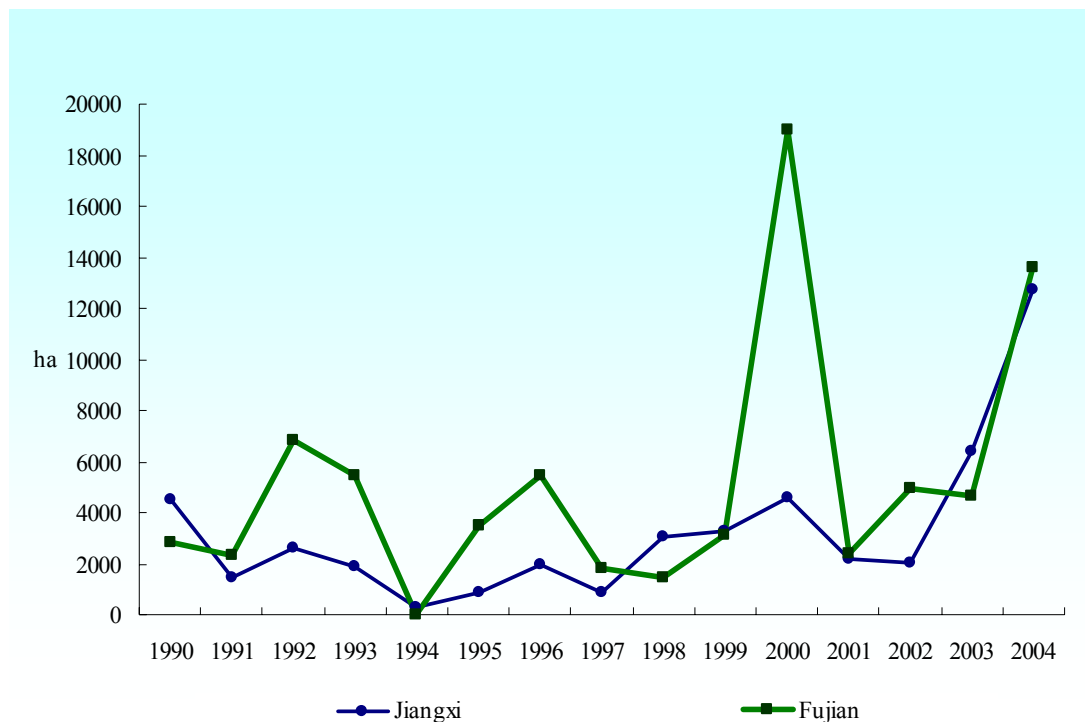
Source: 2006 Survey Data .

Figure 2: Number of Fire Incidences in Fujian and Jiangxi, 1990-2004



Source: SFA, 1990-2004.

Figure 3: Number of Hectares Affected by Fire in Fujian and Jiangxi, 1990-2004



Source: SFA, 1990-2004.

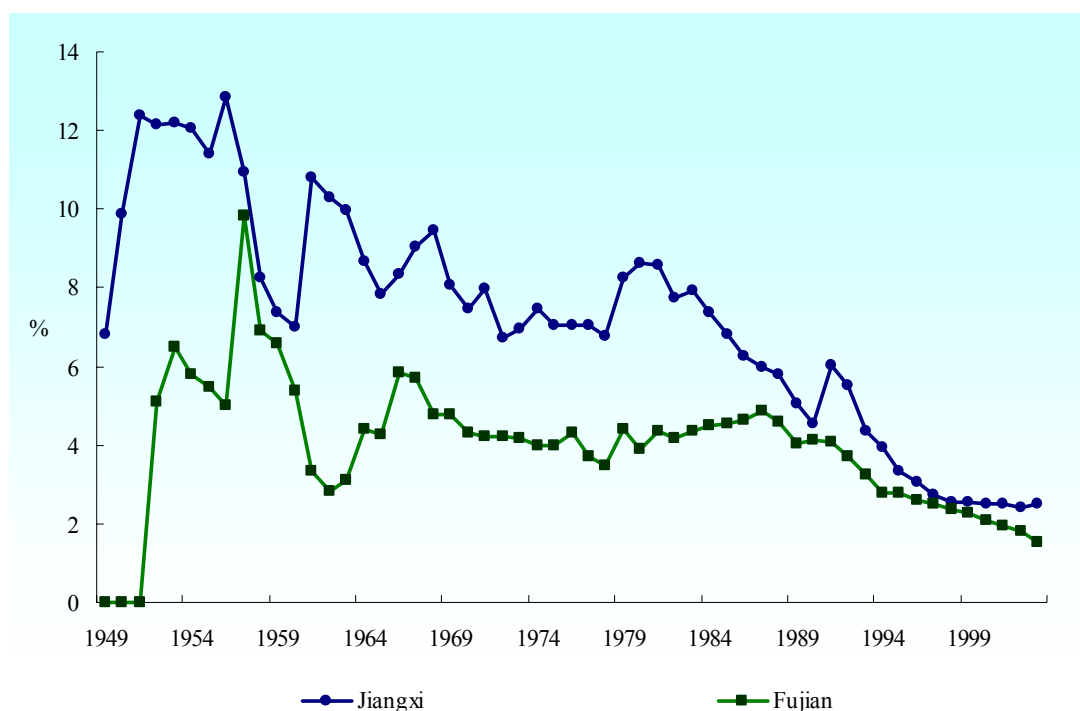
In the spring of 2003, the provincial government of Fujian formally approved the reform, but precedents had already been established in 1998⁵ when a rural village suffering from severe deforestation due to ineffective collective management, decided to reform forest tenure. In 2002, another village individualized user rights to villagers and sold some of the forests to people outside the village. In the latter case, the individualization of forest management helped eliminate village debt and provided significant rents for the first time since the first year of reform. The reason was that the farmers who accepted the forest user rights were required to pay a land rental fee to the villages. The forest plots bid away to outsiders earned the village revenues in the form of lump sum stumpage payments. In our survey, many villages in Fujian enjoyed similar gains through forest tenure decentralization. A separate survey (Kong et al, 2006) confirms these findings in Fujian.

The political rationale behind support of the provincial government is also of note. Historically, these two provinces resisted tenure decentralization to certain extents. In the case of Fujian, this is demonstrated by the implementation of an alternative scheme and by cutting short the scale of reform in a short period after the first reform. Why this renewed interest in reforms? The answer may be found partly in the fact that fiscal incentives for the provincial government have changed due to the declining contribution of the forest sector in regional economies (figure 4). While forestry has declined in economic importance, particularly in harvests on state-owned forests and in shipping and processing industry, there has been a concurrent growth of other

⁵ Hongtian Village, Yongan County of Fujian Province individualized forestland tenure in 1998.

sectors and creation of private economies. As a result of these transformations, the opportunity cost of reforming the forest tenure system has been greatly reduced. Combining this fiscal incentive with factors that indicate an increasing opportunity cost of delaying reform, such as growing social unrest due to insignificant forestry-derived family income, and increasing difficulty in forest protection, etc., makes the decision to extend reforms easier.

Figure 4: Forestry Share in GDP 1950s-1999



Source: SSB, 2000

Moreover, national leaders have devoted much greater attention to rural development over the past several years. The New Countryside Development Initiative has translated into serving as a more benevolent policy, since it includes the gradual elimination of agriculture taxes and fees as well as increasing investment in rural infrastructure and basic education. Farmers' rights over agricultural land have also made major progress after the issuance of the Rural Land Contract Law. These progresses in the agricultural sector make the still-stringent policies in the forest sector more susceptible for criticism.

The Nature of Collective Forest Tenure Reform since 2000

By the end of 2007, more than ten provinces had announced plans for collective forest tenure reform. As will be seen later, the magnitude of the current forestland reallocation is not as great as that of the first round of reforms in early 1980s. What makes the second wave reform important can be summarized by the following:

- 1) The once-resistant Fujian province adopted mainstream forest tenure reforms aimed at individualization;
- 2) Provincial decrees have stated that decisions regarding forest land reallocation should be made by village representative committees or by village assemblies requiring a 2/3 vote majority.
- 3) Redistribution of plots will be accompanied by legal contracts and forest certificates;
- 4) The allowable contract period is extended to 30 to 70 years;
- 5) Adoption of the Rural Land Contract Law has enabled expanded rights, including those of land transfer, inheritance and mortgaging.

II. Survey and Data Collection

In March and May 2006, we surveyed twelve counties in Fujian and five counties in Jiangxi to begin studying the effects of collective forest tenure reform⁶. In October 2006, we surveyed six counties in the coastal province of Zhejiang, which represents another important collective forest region. In each county, we conducted interviews in three townships, each with two villages and ten households in each village. By the end of September 2007, we had surveyed five additional provinces; these included Anhui, Hunan, Shandong, Liaoning, Yunnan. Sample statistics are provided in table 3.

Our surveys focused on information at the village and household level. The village level surveys investigated information on forest resource change, village natural conditions, village social, economic and demographic characteristics, land use patterns, land use policies governing the village decisions, forest regulations, public programs, village political systems, etc. Three questionnaires were used to gather respective information on 1) village economic activities, land management, the tenure reform process, social, economic and demographic characteristics, etc., carried out using personal interviews with village leaders and covering the period from 2000 to 2006; 2) changes in forest resource and the history of forest production from 1985 to 2006, using information provided by local forestry agencies; 3) village financial information (collective revenue and expenditure), provided by the township government for the years of 2000 and 2006.

Table 3: The Survey on Collective Forest Tenure Reform: Sample Statistics

Time	Province	County	Township	Village	Household
2006.3-4	Fujian*	12	36	72	720
2006.5	Jiangxi*	5	15	30	300
2006.10-11	Zhejiang*	6	18	36	360
2007.4	Anhui*	5	15	30	300
2007.4	Hunan	5	15	30	300

⁶ Funding for the survey in Fujian was provided by Ford Foundation. RRI funded the subsequent surveys and researches in 2006 (in Jiangxi and Zhejiang). The World Bank funded surveys in five provinces conducted in 2007.

2007.5-6	Liaoning*	5	15	30	300
2007.5-6	Shandong*	5	15	30	300
2007.8	Yunnan	6	12	30	600
Sum	8	49	141	288	3180

Note: *=Provincial decree has been issued by the time the survey was being conducted.

Household interviews covered information on social, economic and demographic characteristics, production and consumption, land use practices and land rights, forest management activities and rights, asset changes, basic social relationships, and information on participation in the tenure reform. The survey asked farmers to provide information for two years: 2000 (before tenure reform) and 2005 or 2006 (after tenure reform)⁷.

III. Change of Collective Forest Tenure since 2000

1. Categorization of Forest Tenure Types

Based on the information collected in the survey areas, we ascertained more than ten different tenure types (or management arrangements). For purposes of analysis, we have grouped them into six broad categories. Relationships between these six categories and existing tenure types are as follows:

Private Plot (Zi-Liu-Shan): similar to private plots in the agricultural land tenure system, farmers managing this type usually enjoy rights similar to private ownership and comparatively stable tenure rights;

Individual Household Management (Dan-Hu-Jing-Ying): forestland managed by individual farmer households within the village, this includes responsibility forestland and farmer-managed forestland negotiated either through a special contract or with a rental agreement. Responsibility forestland is a standard tenure type and is similar to what is referred to as responsibility land in the agricultural sector. The other type is less standard and the terms of the contract or rental agreement are, to a larger extent, subject to village council discretion. In the current round of reforms, a common element in individual contracts is the issuance of forest certificates and the allowance of a long contract periods (30-70 years); these developments has meant that these types are now converging toward the private plot system described above.

Partnership (Lian-Hu-Jing-Ying): forestland managed by a group of farmers formed on voluntary basis. These groups usually contain five to ten households.

Villager Cluster (Zi-Ran-Cun, Xiao-Zu): forestland managed by a cluster of families living in the same neighborhood; these clusters are the outgrowth of a form originally used to organize collective production in the planned economy era. In many, but not

⁷ Questionnaires used in the survey are available from the authors upon request

all, places the villager cluster coincides with natural villages. In the current rural system, these are sub-branches of an administrative village and are usually the main form of land holdings with clear boundaries between each other. Forestland managed by villager clusters is considered the same as being collectively managed, but at a smaller scale.

Outsider Management Contract (Lin-Di-Liu-Zhuan)⁸: forestland contracted out for utilization and management by individuals and organizations residing outside the villages.

Collective Management (Ji-Ti-Jing-Ying): forestland managed directly by an administrative village council.

It is generally understood that, since the reforms, the first three categories provide direct benefits to ordinary farmers, while the various levels of village leadership are the direct beneficiaries of the latter three categories. To what degree the reforms have redistributed welfare within villages largely hinges upon these two broad divisions of management.

There is another category of forest use, which is referred to as ecological reserve forest (Sheng-Tai-Gong-Yi-Lin), newly imposed in collective forest areas by the government in late 1990s and early 2000s. Various percentage of collective owned forestland is classified as ecological reserve forests and is prohibited from commercial use. Although this policy was applied universally, villages with their forests within close proximity to major road and rivers were most affected. Since this new zoning policy was primarily a government initiative, the extent of the ecological reserve forest in the villages under survey is used as an exogenous variable demonstrating the level of regulatory intrusion in collective forest areas.

2. The bundle of rights in each tenure types

Associated with each tenure type is a bundle of rights (transferability, inheritance, mortgageability, harvest rights, freedom of production decision, contract length, etc.) specified in the contracts. These rights reflect the level of rigor of tenure for the contractors. In fact inclusion of such concrete rights into the different tenure types has marked significant progress over the previous round of tenure reform and may be the element making the recent round more successful. In our survey, questions on the combination of right elements associated with different types of tenure arrangements were asked to the farmers interviewed. The answers to these questions reflect knowledge of tenure rights of farmers, considered by us as good proxies of de facto tenure rights of farmers benefited from the reform. The answers were in the form of discrete choices and are listed in table 4.

Table 4: Distribution of Tenure Rights as Perceived by Villagers

⁸ This type is sometime under the categorization of “market allocated plot”.

Right	Response	Individual	Villager Cluster	Partner	Outsider Contract	Eco Reserve	Collective
Conversion to Ag land	Yes	35.01	11.11	24.32	18.60	4.17	3.23
	Yes with Village Approval	1.71	3.70	2.70	0.00	2.08	0.00
	No	57.77	79.63	70.27	70.93	87.50	51.61
	Others	5.51	5.56	2.70	10.47	6.25	45.16
Conversion to Other Forest Type(e.g. orchard)	Autonomous	67.44	59.26	56.76	50.00	43.75	19.35
	Yes with Village Approval	4.77	14.81	8.11	4.65	8.33	0.00
	No	20.32	20.37	32.43	32.56	39.58	38.71
	Others	7.47	5.56	2.70	12.79	8.33	41.94
Autonomy for Tree Species Seletion	Autonomous	74.30	68.52	70.27	63.95	47.92	25.81
	Yes with Village Approval	3.43	11.11	5.41	4.65	2.08	0.00
	No	16.03	14.81	21.62	22.09	39.58	32.26
	Others	6.24	5.56	2.70	9.30	10.42	41.94
Right to Manage NTFP	Autonomous	89.84	88.89	83.78	77.91	81.25	54.84
	Yes with Village Approval	1.96	1.85	0.00	1.16	2.08	0.00
	No	3.67	5.56	13.51	9.30	10.42	3.23
	Others	4.53	3.70	2.70	11.63	6.25	41.94
Right to Mortgage Forest	Autonomous	52.14	40.74	43.24	27.91	41.67	25.81
	Yes with Village Approval	5.39	7.41	8.11	4.65	8.33	0.00
	No	35.25	31.48	35.14	47.67	41.67	54.84
	Others	7.22	20.37	13.51	19.77	8.33	19.35
Transfer Right within Village	Autonomous	66.10	46.30	64.86	45.35	47.92	61.29
	Yes with Village Approval	15.30	14.81	10.81	3.49	16.67	9.68
	No	15.54	27.78	21.62	38.37	27.08	29.03
	Others	3.06	11.11	2.70	12.79	8.33	0.00
Transfer Right Outside Village	Autonomous	50.18	38.89	54.05	33.72	47.92	48.39
	Yes with Village Approval	15.06	5.56	13.51	4.65	12.50	22.58
	No	31.46	42.59	29.73	48.84	31.25	29.03
	Others	3.30	12.96	2.70	12.79	8.33	0.00
Right to Harvest	Yes	78.21	79.63	78.38	60.47	70.83	45.16
	No	16.03	16.67	13.51	30.23	20.83	19.35
	Others	5.75	3.70	8.11	9.30	8.33	35.48
Right to Abandon Forestland	Yes	30.35	14.81	16.22	15.12	14.58	19.35
	No	65.61	79.63	75.68	75.58	68.75	74.19
	Others	4.04	5.56	8.11	9.30	16.67	6.45

Source: Survey conducted in 2006 and 2007.

Table 5: Distribution of Contract Length for Different Tenure Types

Province	Description	Individual	Villager Cluster	Partnership	Outsider Contract
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Fujian	Mean	34.26	27.46	33.47	31.58
	Min	1.00	2.00	3.00	1.00
	Max	70.00	50.00	50.00	50.00
Jiangxi	Mean	35.11	40.00	50.00	30.00
	Min	15.00	30.00	30.00	30.00
	Max	72.00	50.00	70.00	30.00
Zhejiang	Mean	31.84	50.00	50.00	13.60
	Min	1.00	50.00	50.00	5.00
	Max	50.00	50.00	50.00	23.00
Anhui	Mean	35.22	25.00	21.86	26.60
	Min	10.00	25.00	1.00	1.00
	Max	50.00	25.00	40.00	50.00
Hunan	Mean	35.02	30.00	30.00	-
	Min	10.00	30.00	30.00	-
	Max	70.00	30.00	30.00	-
Liaoning	Mean	41.66	-	-	33.50
	Min	2.00	-	-	1.00
	Max	70.00	-	-	50.00
Shandong	Mean	26.04	-	-	9.00
	Min	6.00	-	-	8.00
	Max	50.00	-	-	10.00
Yunan	Mean	42.16	70.00	47.67	54.44
	Min	1.00	70.00	3.00	30.00
	Max	70.00	70.00	70.00	70.00
Total	Mean	35.41	43.35	33.32	43.70
	Min	1.00	3.00	1.00	1.00
	Max	72.00	70.00	70.00	70.00

Source: Survey conducted in 2006 and 2007.

Table 5 demonstrates contract length for different types of tenure. Wide range of contract length exists for all types.

2. Tenure Change since 2000

Table 6 and Figure 5 demonstrate the change in the share of different tenure types during 2000 and 2006 in the eight provinces surveyed⁹.

Based on table 6 and figure 5, if we view individualization (including voluntary partnerships) as the main objective for reform over the period from 2000 to 2006, then it would appear that Fujian, Liaoning, Shandong and Yunnan experienced significant progress toward this goal. Although Jiangxi and Zhejiang were in the first group to announce tenure reform, they did not experience significant changes in their

⁹ In the ensuing presentation, we merge private plot with individual tenure due to the fact that these two converge in their characteristics.

management categories. In Jiangxi, significant inter-category conversion occurred between Villager Cluster and Outsider Contract. In Zhejiang, individualization has not increased, likely due to the fact that individual management had already been implemented in more than 80 percent of the collective forests prior to the onset of the current reforms, making only limited room for further reform. Similarly, we can attribute the same reasons to the insignificant changes seen in Hunan. In Anhui, individual management decreased, stemming from expansion of eco-reserves. This is consistent with the fact that south Anhui has been a major tourist destination; setting aside a bigger share of forestland as eco-reserve demonstrated the effort to preserve the tourism value of the forests.

Shandong was a particularly interesting case in that it is a province in northern China with historically little forest coverage. Afforestation efforts have been focused on establishing shelterbelts surrounding cultivated land. Therefore, prior to the reforms, eco-reserves occupied a large share of forestland. Evidently, a large share of the eco-reserves (shelterbelt), as well as some of the collectively managed forests, has been transferred to individuals for management.

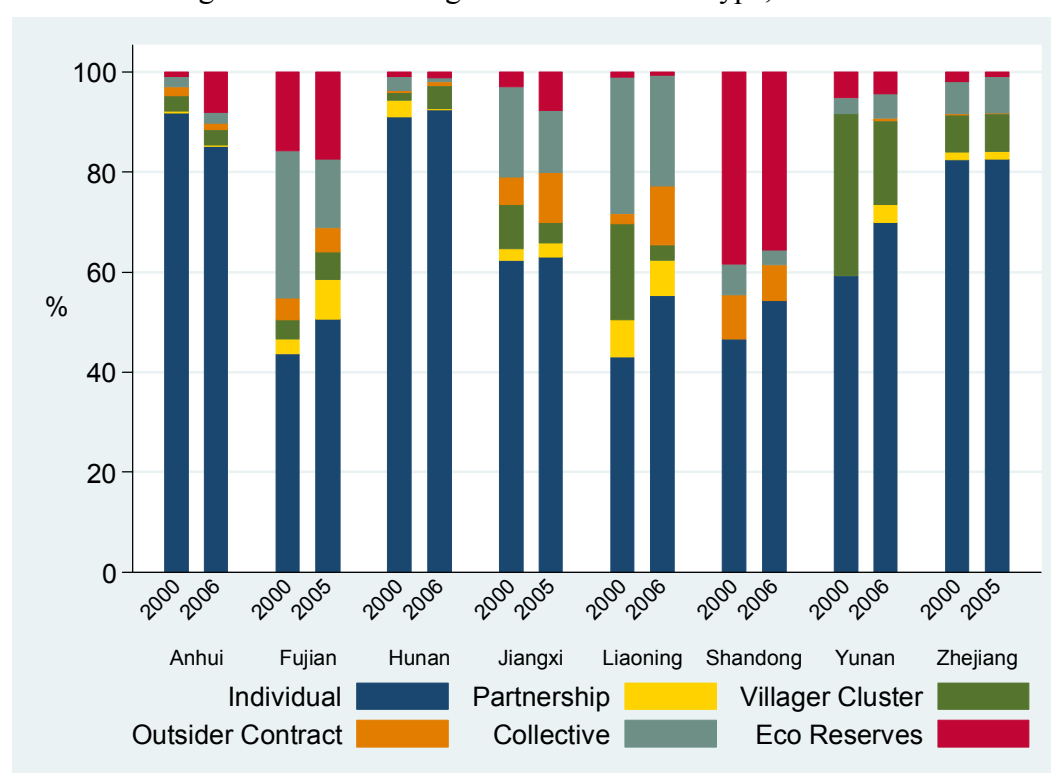
We can observe that in Yunnan, the share of collective management actually increased, accompanied by increases in individual and partnership management. Reductions in tenure type were largely in the Villager Cluster category. It is our assessment that collectivization occurred in places where large areas of forests were affected by the Natural Forest Protection Program and fall under the category of eco-reserve.

Table 7 and figure 6 show changes of actual area per village in each type of forest tenure.

Table 6: Share Change of Forest Tenure Types in 2000-2006

Province	year	Individual	Partnership	Villager Cluster	Outsider Contract	Collective	Eco-Reserve	Total
Fujian	2000	43.61	2.94	3.97	4.29	29.27	15.93	100.00
	2005	50.63	7.81	5.62	4.72	13.78	17.44	100.00
Jiangxi	2000	62.23	2.31	8.93	5.49	17.93	3.12	100.00
	2005	62.97	2.77	4.16	9.95	12.47	7.67	100.00
Zhejiang	2000	82.45	1.37	7.43	0.26	6.62	1.86	100.00
	2005	82.66	1.37	7.48	0.25	7.37	0.87	100.00
Anhui	2000	91.81	0.40	3.08	1.58	2.24	0.89	100.00
	2006	85.07	0.40	3.06	1.28	2.07	8.12	100.00
Hunan	2000	90.89	3.41	1.66	0.38	2.78	0.88	100.00
	2006	92.43	0.27	4.46	0.74	0.98	1.11	100.00
Liaoning	2000	42.93	7.52	19.27	1.94	27.37	0.97	100.00
	2006	55.21	7.04	3.08	11.90	22.09	0.68	100.00
Shandong	2000	46.58	0.00	0.00	8.77	6.17	38.47	100.00
	2006	54.30	0.00	0.00	7.05	3.08	35.56	100.00
Yunan	2000	59.22	0.00	32.44	0.00	3.05	5.29	100.00
	2006	69.87	3.68	16.63	0.45	5.03	4.35	100.00

Source: Survey conducted in 2006 and 2007.

Figure 5: Share Change of Forest Tenure Type, 2000-2006¹⁰

Source: Survey conducted in 2006 and 2007.

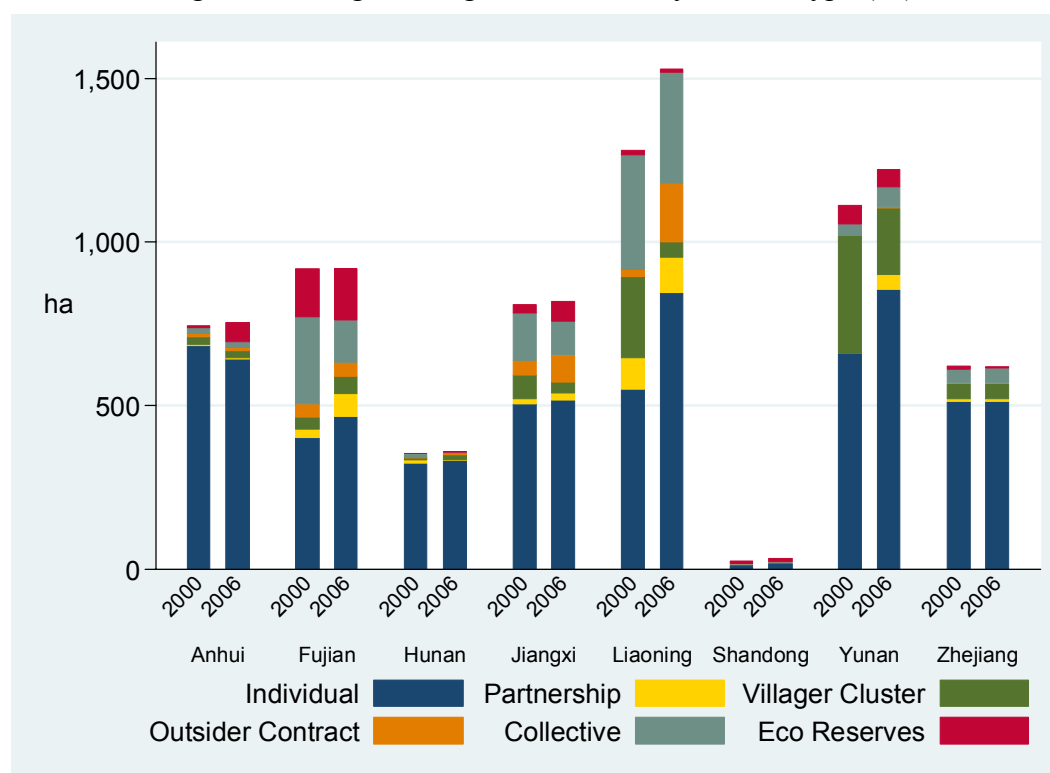
¹⁰ Surveys in Fujian, Jiangxi and Zhejiang were conducted in 2006. Final year of data was 2005 for these three provinces. Same applies in all the subsequent charts. The final year was labeled "2006" due to rigidity of chart making technique.

Table 7: Village Average Forest Area by Tenure Type, 2000-2006 (ha)

Province	Year	Individual	Partnership	Villager Cluster	Outsider Contract	Collective	Eco-Reserve	Total
Fujian	2000	400.21	26.99	36.40	39.36	268.63	146.16	917.74
	2006	465.54	71.82	51.67	43.41	126.71	160.33	919.48
Jiangxi	2000	503.25	18.65	72.19	44.43	145.03	25.20	808.74
	2006	515.66	22.70	34.04	81.51	102.13	62.85	818.88
Zhejiang	2000	512.00	8.50	46.16	1.63	41.10	11.57	620.95
	2006	511.92	8.50	46.34	1.56	45.62	5.37	619.31
Anhui	2000	684.30	3.00	22.92	11.79	16.66	6.64	745.33
	2006	642.23	3.00	23.08	9.70	15.64	61.32	754.97
Hunan	2000	321.83	12.09	5.88	1.33	9.83	3.11	354.06
	2006	331.79	0.98	16.01	2.67	3.53	3.98	358.96
Liaoning	2000	549.47	96.22	246.69	24.86	350.34	12.39	1279.97
	2006	844.27	107.69	47.04	181.95	337.83	10.35	1529.13
Shandong	2000	11.48	0.00	0.00	2.16	1.52	9.48	24.64
	2006	17.39	0.00	0.00	2.26	0.99	11.39	32.03
Yunan	2000	659.09	0.00	361.02	0.00	33.99	58.92	1113.02
	2006	853.68	44.90	203.15	5.46	61.42	53.17	1221.78

Source: Survey conducted in 2006 and 2007.

Figure 6: Village Average Forest Area by Tenure Type (ha)



Source: Survey conducted in 2006 and 2007.

IV. Observable performance of the tenure reforms so far

In this section we will mainly examine changes in forest management (harvest and afforestation) and changes in farmer income derived from forestry.

1. Timber harvests have increased dramatically in provinces with significant recent reform.

As demonstrated in table 8 and figure 7, average timber harvests in villages increased dramatically in Fujian, Liaoning, Shandong and Yunnan during the 2000 to 2005/2006 period. This trend of increasing harvest coincided with the trend toward individualization, since individual and partnership management became the main source of timber production. In Fujian and Liaoning, there has also been spectacular growth in timber production by those holding outsider contracts; this is particularly noteworthy given the decline of this sector in the other provinces, except Shandong, which experienced only a very minimal growth. This finding is consistent with field observations that large shares of outsider contracts were granted for harvest rights (concessions).

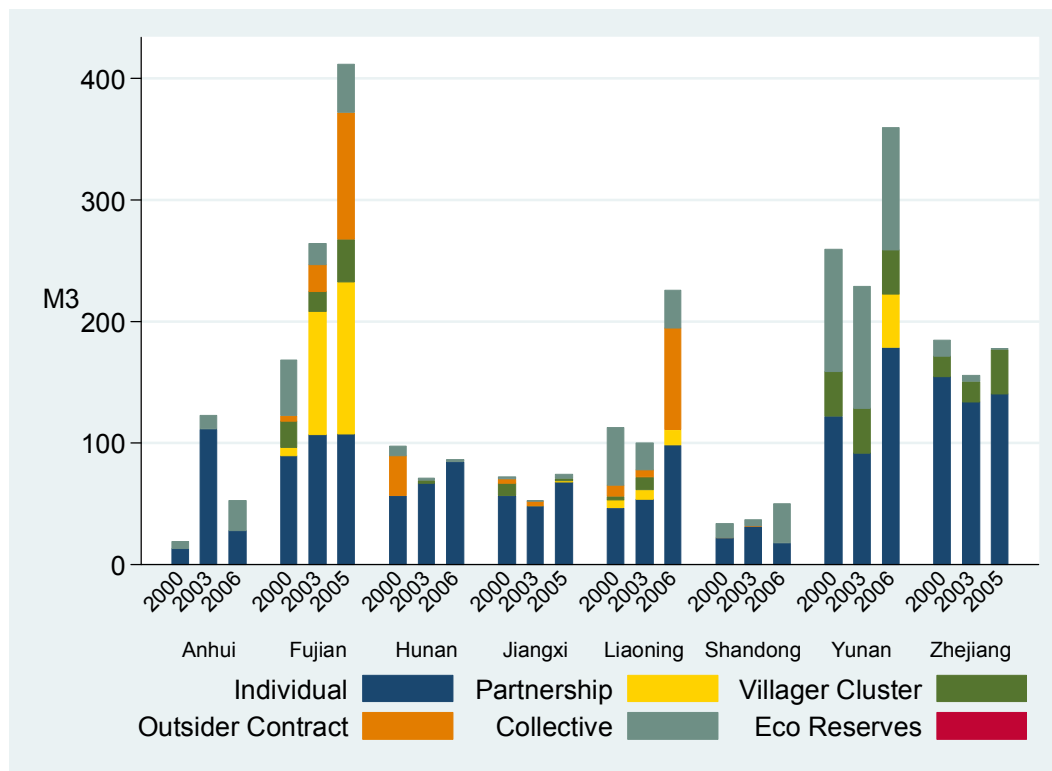
Table 8: Timber Harvest per Village during 2000 and 2005(6), in cubic meters

Prov	Year	Individual	Partnership	Villager Cluster	Outsider Contract	Collective	Total Forestland
Fujian	2000	89.14	6.73	21.67	4.42	46.60	168.56
	2003	106.70	101.55	16.67	21.73	17.52	264.17
	2005	107.33	124.97	35.00	104.48	39.97	411.75
Jiangxi	2000	56.07	0.00	10.50	3.33	2.00	71.90
	2003	47.70	0.67	0.00	3.33	0.50	52.20
	2005	67.84	0.62	2.00	0.00	3.33	73.80
Zhejiang	2000	154.86	0.00	16.67	0.00	13.33	184.86
	2003	133.75	0.00	16.75	0.00	5.28	155.78
	2005	140.56	0.00	36.25	0.00	0.83	177.64
Anhui	2000	12.83	0.00	0.00	0.00	5.67	18.50
	2003	111.02	0.00	0.00	0.00	11.48	122.51
	2006	27.80	0.00	0.00	0.00	24.67	52.47
Hunan	2000	55.95	0.00	0.00	33.33	7.93	97.22
	2003	66.50	0.00	2.49	0.00	1.74	70.73
	2006	83.90	0.00	0.00	0.00	2.00	85.90
Liaoning	2000	46.20	6.67	2.67	9.33	47.57	112.43
	2003	53.33	7.33	11.00	6.00	22.00	99.67
	2006	97.53	12.67	0.00	84.33	31.07	225.60
Shandong	2000	21.61	0.00	0.00	0.50	11.43	33.54
	2003	30.66	0.00	0.00	0.93	5.13	36.72
	2006	16.99	0.00	0.00	0.00	32.67	49.66
Yunnan	2000	121.27	0.00	37.33	0.00	100.70	259.30

2003	91.53	0.00	36.67	0.00	100.70	228.23
2006	178.17	44.57	36.00	0.00	100.70	360.10

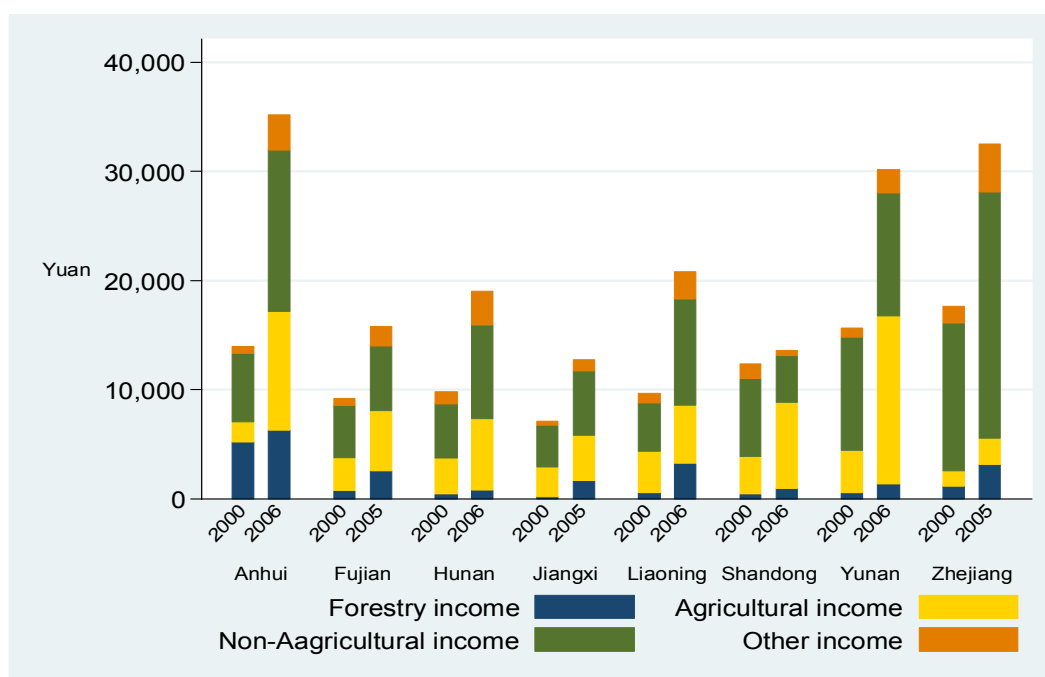
Source: Data was from the survey conducted in 2006 and 2007.

Figure 7: Timber Harvest per Village in 2000, 2003, 2005(6)



Source: Survey conducted in 2006 and 2007.

Figure 8: the Change in Household Net Annual Income, 2000-2005(6)



Source: Data comes from the survey conducted in 2006 and 2007.

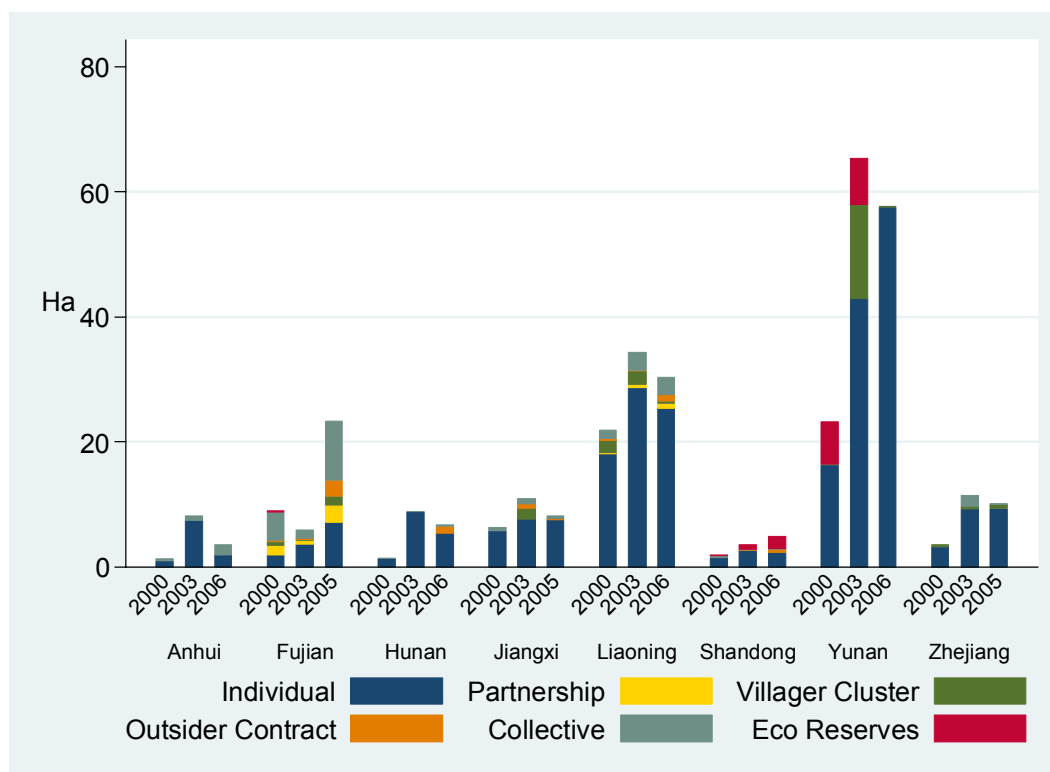
2. Forest shares in farmer household income increased greatly

In the five to six year period of study, farmers’ net income increased dramatically as a whole. However, the share of forest income (forest product sales) increased at a higher rate in areas where the reforms had a significant impact during this period. From figure 8 we can see that, in general, net household income rose, with off-farm income rising the fastest. Only in Fujian, Jiangxi, Liaoning, and Shandong did income generated from forestry occupy a significantly larger share of total net income. Concurrent with the reduction of production forests, the share of forestry-derived income declined in Anhui Province.

3. Afforestation increased greatly too, mainly by farmers and farmer groups

According to the results from our survey, afforestation in general rose during the period 2000-2006, with the exception of Anhui. Afforestation by individuals increased the most in Fujian, Hunan, Liaoning, Yunnan and Zhejiang. As depicted in figure 9, afforestation by other tenure types also increased in Fujian, Liaoning, and Shandong. This indicates that other factors aside from tenure reform played a role in the recent afforestation boom. We believe this to be due to market growth, and we will examine this empirically later.

Figure 9: Area of Afforestation per Village, 2000, 2003 and 2005



Source: Survey conducted in 2006 and 2007.

V. Concluding Remarks

A. Summing up findings from the survey

1. The structure of collective forest tenure has changed over the last five to six years, with each participating province experiencing different trends of change. Individual management and partnership, the targeted tenure models, increased most significantly in Fujian, Liaoning, Shandong and Yunnan. Outsider contracts increased the greatest in Jiangxi. Eco-reserve forests expanded most dramatically in Anhui. No major changes in tenure type occurred during this period in Zhejiang and Hunnan.
2. The variation of tenure choices across villages and provinces is largely a result of original tenure structure and the collective decision making process. In line with the recent development in rural election and village autonomy, village representative or village assembly became the authority to develop concrete reform plan for the respective village, making tenure structure changes more suited to local political settings, socio-economic as well as natural conditions.
3. Farmer revenue from forests, including timber harvests, increased in the areas that experienced significant changes in tenure type; this posits serious challenges to existing policy regarding limits on harvesting (e.g., logging quotas).
4. Tenure reform, which created many more small forest landowners in a relatively short period, now poses regulatory challenges for forest authorities. It will become increasingly difficult to implement key forest policies, such as the logging quota system, due to the fact that forestland subject to the quota has been further decentralized and the cost of regulating harvests has increased.
5. Afforestation by farmer households, farmer groups and other private entities increased significantly during this period of tenure reform, which is a good sign for the long term sustainability of forest management. The contribution of other potential factors driving the increased private interest in afforestation still requires identification and analysis.
6. Forest tenure reform will be a longer process than some expected. Many newly created or rising tenure types, such as partnerships and outsider contracts, are intermittent arrangements. When socio-economic factors change, relationships among partners change, and some of these partners will undoubtedly separate. As contract periods expire, outsider contracts will have to be renegotiated and their forestland may be returned to the original community. All these changing factors will require redistribution of management rights. Other factors, such as widespread forestland conflicts, can also cause shifts in the tenure system.

B. Implications to future policy development

The tenure reform is meant to provide incentive to farmers and private sector to invest in forest development and manage forest more sustainably. Once larger share of collective owned forests is under individual management, it brings challenges to existing policies and regulations. Most prominent examples are the following:

1. Logging quota system

Logging quota system was established in late 1980s to contain harvest volume from forest owners for the perceived purpose of sustainable forest management. The implementation of logging quota system was not effective in the sense it did not achieve the goal of ensuring harvest below growth both in collective forest areas and in state forest areas. Over harvesting in the state forest areas have been documented by official report (Zhang 1998). Furthermore, the implementation of logging quota, once being done strictly, impose severe disincentive for private sector (including farmers) to expand forest investment due to rigidity of the harvest control. Together with high tax and the government intrusion of tenure rights, farmers' and private incentives were severely damaged. Tenure reform created tens of millions of more small forest holders in a short period. With stronger sense of property rights, farmers will ask for bigger freedom in disposability of forest assets, including timber harvesting. The legitimacy of continued government control over harvest was much challenged and the cost of managing logging quota was much higher. In this context forest authority basically liberalized harvest in Fujian, the lead tenure reform province, in response to the higher pressure from farmers for harvesting rights. It is anticipated that more flexible logging management system will be developed to suit for the new situation. Some form of management plan is considered strong candidate in lieu of logging quota management system.

2. Eco-reserve Forests

Between mid 1990s and early 2000s Chinese government delineated large areas of forests (state and collective owned) as eco-reserve forests (or ecological benefit forests, as an alternative name). On average, each province has more than 30% of their forest classified into the eco-reserve forests, lots of them without any compensation. The establishment of eco-reserve forest system can be considered a precautionary measure at the government side to guarantee certain level of stability of ecological services from forests in the era of fast institutional changes. Nevertheless, the fact that this effort is in conflict with the spirits of the recent political (NCDI) and legal (Rural Land Contract Law, Property Law) development will make it vulnerable to challenges and local conflicts. The increased recognition of farmer tenure rights will soon call for re-delineation of eco-reserve forests or much higher and serious compensation scheme.

3. Regulations on forestland market

We observe strong enthusiasm of local governments in developing forestland market. Inside different level of government there are also widespread concerns over potential social conflict due to irrational land transfer. Concerns on weak farmers losing land quickly are particularly strong. Therefore, on one hand people observe fast construction of local forestland market place and local regulations on forestland transfer, on the other hand there is strong voice for the development of certain controlling regulations on forestland transfer.

4. Farmer associations

In the process of tenure and regulatory decentralization, it is expected that voluntary farmer association will emerge. It was very interesting to notice that in Fujian, the first generation of farmer associations had heavy concentration on fire protection association in most villages and marketing association for orchard products. Fire control association obviously reflect the fact that fire watch has great economy of scale and coordinated fire protection will save farmers cost of forest protection. The marketing associations serve to lift the brand value of local special products, raising bargaining power of producers and reduce information cost of marketing, etc. It is also observed that many newly emerged associations are with government background. It is not clear whether these government-backed associations serve as complements or substitutes to the more grass-root ones.

5. Forest financing system

Micro-credit system is popular in rural China now. However, these micro credit items are not designed to suite for long term investment as forest investment requires. As farmers gained more forestland, lots of them would like to invest in forest planting or improvement. Demand for a suitable financing instrument is high.

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