Journal of Forest Economics 20 (2014) 126–140

Contents lists available at ScienceDirect

Journal of Forest Economics

journal homepage: www.elsevier.com/locate/jfe

The effect of collective forestland tenure reform in China: Does land parcelization reduce forest management intensity?

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ARTICLE INFO

Article history:
Received 23 September 2013
Accepted 14 March 2014

JEL classification:
Q23
N50

Keywords:
Land tenure reform
Collective forest
Forest management
Forest policy
Double hurdle model

ABSTRACT

China implemented a new round of collective forestland tenure reform during 2003–2013. In this reform, forestland owned by villages or township collective organizations were divided into a great number of small plots and allocated to member households of the collectives. A widespread concern about the reform is that parcelization of forestland might limit farmers' incentives to invest in forest management. This paper examines the factors affecting farmers' investment in forest management using household data collected in four provinces in 2010. The results show that the intensity of a household's investment in forest management is negatively affected by its nonfarm income and the average size of forest plots, but positively affected by the easiness in obtaining loan and the technical assistance the household receives. We argue that the counterintuitive effect of nonfarm income on investment intensity is due to the increasing marginal cost of own labor input. The effects of forest plot size and easiness in obtaining loan suggest that households have limited amount of capital to invest in forest management. Because of this constraint, parcelization of forestland resulted from the recent reform has not yet caused any reduction of the intensity of investment in forest management.

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http://dx.doi.org/10.1016/j.jfe.2014.03.001
1104-6899/

Introduction

About 60% of the forestland in China is collectively owned by villages or township collective economic organizations, and the rest is under State ownership (The State Forestry Administration, 2010). Collective ownership of forestlands was built up in the 1950s, and these forests were managed by the collectives until the beginning of the 1980s. The defects and inefficiency of this management regime were widely acknowledged by the end of the 1970s (Lu et al., 2002). Since 1981, the Chinese Government has implemented a series of reforms in order to improve the management of collective forests.

There is a huge body of literature on forestland tenure reforms in China. Only a relatively small share of the studies focused on the effects of these reforms on forest management activities. The results of these studies are mixed. Yin and Newman (1997) examined the impacts of the first round of forestland tenure reform on timber harvest and on the dynamics of forest resource during 1978–1989. They found that timber harvest, timber inventory, and forest area in northern China increased dramatically between 1978 and 1989. During the same time period, southern China experienced only moderate increase in timber harvest and forest area, whereas the timber inventory decreased. Their results show that the reform increased timber harvest in both regions, but had opposite effects on the development of forest resources in the two regions. Zhang et al. (2000b) examined timber harvest and forest cover during 1978–1995 in the same regions as Yin and Newman (1997) and found that land tenure reform had a positive effect on the increase of forest area in both the southern and the northern regions.

Rozelle et al. (2003) examined the impacts of forestland tenure and policy changes on forest area and timber inventory in China during 1980–1993 using national forest inventory data. The results suggest that policy changes since the late 1970s had a positive effect on increasing the level of timber inventory but a negative effect on the change of forest area. Wang et al. (2004) examined the factors that explain tree planting in China during the period 1953–2001. They found that forest reform in general had a negative effect on the total area of afforestation/regeneration. The reason for the unexpected result was, according to the authors, the increase of illegal timber cutting triggered by the reform since 1978 and that the reforms did not provide sufficient incentive for tree planting because of a series of irrational institutional arrangements such as heavy tax burdens.

Xie et al. (2011) examined the effect of the recent reform on forestation at the village level using 3 years data (2000, 2003, and 2005/2006) for 288 villages in eight provinces. They found that the reform resulted in a significant increase in the area of newly forested land in the year the reform was implemented. The reform also affected positively forestation in the subsequent years, but the effect was much smaller. They also found that implementation of the reform did not cause an immediate increase in timber harvest. Since timber harvest did not increase, afforestation reduced the area of un-wooded land. This explains why the effect of the reform on forestation decreased with time. It also implies that the reform would cause an increase in the total forest area, at least in the short-run.

In a recent study, Qin and Xu (2013) examined farmer's forestry investment (labor input and fertilizer application) in Fujian province using household survey data collected in 2006. The study distinguished among three types of forestland (timber forest, bamboo forest, and economic forest) and several different forms of land right arrangements. A general conclusion of this study is that farmers tend to invest less on forest plots for which the land tenure security is perceived to be low. For timber forests, they found that increasing harvest quota (the allowable harvest relative to the standing timber stock) would increase the labor input per unit area. Moreover, the size of forest plot has a significant and negative effect on the labor input per unit area for both timber and bamboo forests.

One consequence of the recent reform is parcelization of forestland – larger forest tracts were divided into small plots and granted to different households. In general, small forest plots imply higher unit costs for harvesting, regeneration, and other silviculture activities, which usually lead to lower management intensity (Zhang et al., 2005). In the United States and many European countries, forest parcelization is typically associated with reduction of holding size, which often reduces the incentive and possibility for landowners to conduct intensive management of the forests (Mehmood and Zhang, 2001; Zhang et al., 2005; Butler and Leatherberry, 2004; Haines et al., 2011; Hatcher et al., 2013). Many studies have provided strong evidence that management intensity is positively correlated to the size