Policies for sustainable land management in the highlands of Ethiopia

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Community natural resource management: The case of woodlots in northern Ethiopia

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Introduction

Common property resources1 are important sources of timber, fuelwood and grazing lands in developing countries. Unrestricted access or ineffective use regulations have resulted in overexploitation of the resources. Reliance on appropriate policies and technologies, or efficient market prices alone cannot solve the problem of resource degradation in developing countries. Local level institutions and organisations play an important role in resource management. However, there is lack of evidence in developing countries regarding the nature and effectiveness of local level institutions and organisations of resource management. This paper seeks to address this lack of evidence on management of community woodlots in Tigray, northern Ethiopia. The paper evaluates the nature and impact of community woodlot management and investigates the determinants of collective action and its effectiveness.

The Tigray region is located in northern Ethiopia on the Sudano-Sahelian dry lands zone. More than 80% of the population depends on mixed crop–livestock subsistence agriculture. Since 1991, the region has embarked on a conservation-based agricultural development strategy. The major natural resource conservation strategies include soil and water conservation investments on farmland, protection of area enclosures, development of community woodlots, development of small-scale irrigation and reforestation. Popular participation has been an integral part of the resource conservation effort in the region.

Methods

Results are based on a survey of 50 tabias (the lowest administrative unit in Tigray consisting usually of 4–5 villages) and 100 villages in the highlands2 of Tigray in the 1998–99 cropping season. A semi-structured questionnaire was administered with a group of representatives at both levels. Information was collected on changes in agricultural and natural resource conditions between 1991 and 1998, and their causes and effects. Analysis of descriptive information and econometric analysis were conducted.

The factors used to explain variations in collective action included population density, access to market, agricultural potential, the presence of external organisations,

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1. Common property resources are defined as those resources that are owned and managed by a given community. They are to be contrasted with open access resources that have no defined owner.
2. Highlands are defined as those areas >1500 m above sea level.
whether the woodlot is managed at the tabia or village level and the area of woodlot. The indicators of collective action and its effectiveness in managing woodlots used in the econometric analysis included the amount of uncompensated labour contribution per hectare (ha) invested in managing the woodlots, whether there were any violations of use restrictions of woodlots, whether the community pays for a guard to protect the woodlot, the number of trees planted per ha on the woodlot since establishment and the survival rate of the trees planted.

Results

Almost 90% of tabias have woodlots, with an average of nine woodlots per tabia and an average woodlot area of 8 ha. Most of the woodlots have been established since 1991 and have been promoted by an external organisation, usually the regional Bureau of Agriculture and Natural Resource Development (BoANRD). The most common use allowed on woodlots is to cut and collect grass for feed and construction. In almost all cases, a hired guard paid in cash or in kind protects the woodlot. A cash fine set by the community council usually punishes violations of community rules. The most common violations of use restrictions reported in 1998 included cutting grass, grazing animals, and cutting trees and branches. More violations and lower benefits were reported on tabia-managed than village-managed woodlots. Moreover, villages tended to use a more intensive management strategy. Woodlots contribute, on average, more than 5 million Ethiopian birr (EB; US$ 1 = EB 8 in 1998) per community to community wealth.

Multiple regression analysis to explain the labour intensity of woodlot management, whether the community pays for a guard, whether any violations of use restrictions occur and the survival rates of trees supports the hypothesis of an inverted U-shaped relationship between collective action and population density (i.e. greater collective action to protect and manage woodlots at intermediate population density than at low or high density), perhaps because of less need for collective action when population density is low and difficulties of maintaining collective action when density is high. Communities that are more remote from markets provide greater collective labour input, plant trees more densely and achieve higher tree survival rates, perhaps because the opportunity costs of labour or the opportunities to escape community sanctions for non-co-operation are less further from markets. The presence of external organisations was negatively associated with whether the community pays for a guard, since external organisations often pay for the guard. The presence of external organisation was also negatively associated with tree survival, suggesting that external programmes may not be achieving full participation of local communities in woodlot management. We failed to find evidence of economies of scale in woodlot management in Tigray.

Conclusions and implications

Collective action in managing woodlots generally functions well in Tigray, supporting the role of community resource management in redressing resource degradation. Despite
small current benefits, woodlots contribute substantially to community wealth. Benefits are higher and management problems lower on woodlots managed at the village level. We found some support for the hypothesis of an inverted U-shaped relationship between collective action and population density. Access to market appears to undermine the intensity of collective management of woodlots and its effectiveness, probably by increasing the opportunity cost of labour and/or the ‘exit options’ of community members. The results imply that community resource management can be an effective means of redressing resource degradation and increasing community wealth. Public intervention in community resource management needs to be demand driven and complementary to local effort. Community woodlot management may be more effective if conducted at the lowest level.