Ecological Economics 97 (2014) 162–171

Contents lists available at ScienceDirect

Ecological Economics

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

Analysis

Impacts of access and benefit sharing on livelihoods and forest: Case of participatory forest management in Ethiopia

Aklilu Ameha *, Oystein Juul Nielsen [1], Helle Overgard Larsen

Department of Food and Resource Economics, University of Copenhagen, Rolighedsvej 23, 1958 Frederiksberg C., Denmark

ARTICLE INFO

Article history:
Received 7 April 2013
Received in revised form 31 October 2013
Accepted 24 November 2013
Available online 20 December 2013

Keywords:
Participatory forest management
Income
Asset
Livelihood
Propensity score matching
Ethiopia

ABSTRACT

The introduction of participatory forest management (PFM) may involve the exclusion of previous forest users from accessing forest resources. This is the case for PFM in the two Ethiopian pioneer sites, Dodola and Chilimo that represent two distinct PFM approaches in Ethiopia. This paper analyses how PFM, after controlling pre-PFM differences, affects members of forest user groups (FUGs) and non-members' total annual incomes, forest incomes, expenditures and livestock asset holdings. Income and asset data were collected from 635 randomly selected households. Data were analysed using propensity score matching models. Results show that in Dodola, where commercial timber harvest is allowed, the introduction of PFM means that FUGs have higher livestock assets and forest income than non-members. The average total income and the expenditure for members and non-members, however, were not significantly different. In Chilimo site, the result is the opposite —the introduction of PFM means that FUG members have lower total incomes and assets than non-members. Based on our findings we recommend that the PFM scaling up approaches in Ethiopia, which currently allow FUGs only subsistence use from forest resources, need to be revised.

1. Introduction

Participatory forest management (PFM) has been practised over the last three decades with the objectives of enhancing forest conservation, reducing poverty, and achieving village level development (Agrawal and Gibson, 1999; Agrawal et al., 2008; Andersson et al., 2004; Ribot et al., 2006; Somanathan et al., 2009). The underlying premise of PFM is that sustainable forest management is most likely to occur when local communities manage local forests, and when they get access to direct benefits from participating in forest management (Agrawal and Ostrom, 2001; Ostrom, 1990).

The success of PFM depended much on the extent of rights of access to forest products or forest property rights, forest management task, decision making power and the capacity of communities to create viable institutions (Charnley and Poe, 2007). In PFM arrangements rights that exist with respect to a resource affect the level of benefits that accrue to the right holders. Schlager and Ostrom (1992) defined the following types of rights: (1) Rights of access —who is allowed to enter the forest? (2) Rights of withdrawal —who is allowed to harvest which products? Can they be harvested for sale or only for subsistence? (3) Rights to manage —who defines regulations and is responsible for implementing them? (4) Rights to exclude others —who is responsible for excluding others from the forest? and (5) Rights to convert, sell or transfer land —who can decide about alternative uses of the land.

Many studies have demonstrated that PFM is contributing to forest conservation (e.g. Blomley et al., 2008; Takahashi and Todo, 2012; Thoms, 2008), but welfare implications related with households' participation in PFM remain poorly understood —despite their importance for the sustainability of the concept. Specifically, PFM typically places new restrictive rules and regulations on forest-related livelihood options, mainly in the form of harvesting restrictions (Larson and Pulhin, 2012) that may lead to decline in forest based incomes (Schreckenberg and Luttrell, 2009). To balance the restricted access some PFM programmes introduce income-generating activities to add value to forests (e.g. ecotourism), develop alternative sources of forest products and income (e.g. woodlots) or compensate for the losses (Gobeze et al., 2009). But the welfare implications of these added benefits or compensations also remain poorly understood.

PFM was introduced in Ethiopia in the mid-1990s, like in many other African countries, with the assistance of international NGOs and bilateral organisation (Temesgen et al., 2007). In the case of Ethiopia, the government retains the ownership of the forest while the local communities, organised in forest user groups (FUGs), have use rights. The use rights are granted under the condition that communities maintain at least the forest cover present at the time of PFM introduction. Members of FUGs

* Corresponding author. Tel.: +1 647 633 3129.
E-mail addresses: aklilu_am@yahoo.com (A. Ameha), ojn@iwc.dk (O.J. Nielsen).
[1] Investment Forestry Analyst. The International Woodland Company A/S, Amalievej 20, 1875 Frederiksberg C., Denmark.

0921-8009/$ – see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.ecolecon.2013.11.011

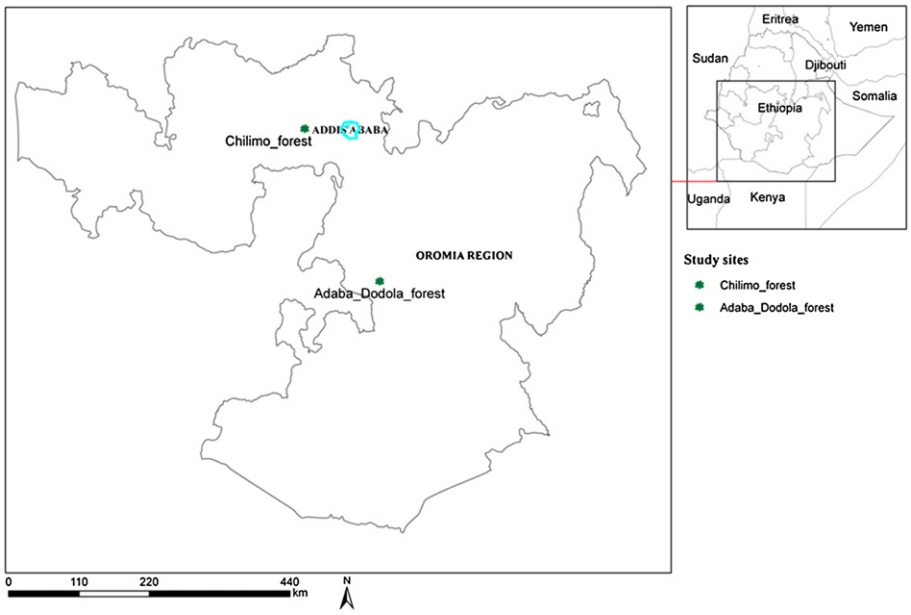

Fig. 1. Map of Adaba–Dodola and Chilimo PFM sites in Ethiopia.

are typically from the same village (Kebele[2]) and they live in or close to the forest designated for PFM. Commercial harvest from natural forest is not allowed in all sites, but Adaba–Dodola PFM site. Each FUG democratically elects its executive committees who run the day to day activates of the group. The group also developed subsidiary bylaws that guide its activities and penalties in case of infringement by members or outsiders. In all cases the management agreement is not limited in time, but the government has the right to revoke it if the forest cover is reduced or if the forest is found 'important' for other uses of national importance (e.g. IFMP, 2004). Today about 667,498 ha of forest land has been under the management of 556 FUGs and 123 FUG cooperatives in Oromia and Southern Nations and Nationalities People Regional states. National scaling up of PFM is planned, and two new donor-funded projects have expanded the PFM activities to the regional states of Amhara and Benesahngul Gumuz.

The importance of forests to rural livelihoods in Ethiopia, similar to many other developing countries (Vedeld et al., 2007), is documented by a number of studies in various locations, which indicate that income from forest products contribute 27–39% of average total annual household income (Abebaw et al., 2012; Babulo et al., 2008; Mamo et al., 2007; Yemiru et al., 2010). Forest products typically harvested by local forest users include firewood, timber, honey, gum, coffee, poles, medicinal plants, spices, charcoal, and grazing (Temesgen et al., 2007).

To study the impacts of PFM on livelihoods necessitates comparison with livelihoods that are not influenced by PFM. The introduction of PFM to Ethiopia has been reported to improve forest condition and income of participants (Amente, 2005; Bekele et al., 2004; Gobeze et al., 2009; Takahashi and Todo, 2012). However, neither of these studies attempted to identify the casual impacts of PFM by removing rival explanations of the observed outcomes that have nothing to do with PFM. Other studies that have addressed this issue (e.g. Ali et al., 2007; Gobeze et al., 2009; Maharjan et al., 2009; Vyamana, 2009) also considered overall average differences between PFM participant and non-participant households, without accounting for potential confounding pre-PFM differences. This is particularly true for studies made in Africa, with the exception of a study in Malawi by Jumbe and Angelsen (2006).

[2] Kebele is the lowest administrative unit in Ethiopia comprising about five sub-villages. In this paper village is used synonymous to Kebele in Ethiopia.

The aim of the present study was thus to evaluate the impacts of PFM on three important facets of livelihoods in Ethiopia: (1) households' total income and forest income, (2) expenditure (consumption), and (3) livestock assets. Expenditure was included to overcome problems related to under reporting of income (Deaton, 1997); livestock are often identified as the key asset in rural Ethiopia and elsewhere (Abebaw et al., 2012; Andersson et al., 2011). The study uses propensity score (PS) and covariate matching models to control for potentially confounding factors, thus allowing better attribution of the outcomes to the PFM programmes, and not to other confounding factors. The paper cannot rely on time series (before and after PFM) because of the lack of base line data collected for before PFM. Attempts at eliciting robust recall based income and expenditure data from the year 2000 were unsuccessful due to interviews in ability to recall.

The resulting improved understanding of the impacts of PFM can contribute to the Ethiopian government's development of a national PFM scaling up programme (Asfaw et al., 2013; Temesgen and Lemenih, 2012). The present study does not, however, look into environmental, social and human impacts of the PFM programme.

2. Methodological and Ideological Options

2.1. Study Area

The study was conducted in two districts, Dendi and Dodola, in the Oromia Regional State of Ethiopia (Fig. 1). These two districts were selected purposively because they are the first two pioneer PFM implementation sites in Ethiopia and they represent two distinct approaches of PFM. In Dendi the Chilimo forest is handed over for local management without commercial timber extraction, while in Dodola the Dodola forest is handed over for local management with commercial timber extraction. In both areas, the forest type is dry afro-montane forest (Friis, 1992) dominated by *Juniperus excelsa* and *Afrocalpus falcatus*.

Prior to the PFM projects the Chilimo and Dodola forests were subject to open-access conditions (Hardin, 1968), i.e. there was no control with who extracted forest products, or the quantities extracted (Amente, 2005; Bekele, 2003). The Chilimo forest is located in the central plateau of Ethiopia, surrounded by vast areas of agricultural land. Most farmers base their livelihood on a mix of crop and livestock production and