



Building future scenarios and uncovering persisting challenges of participatory forest management in Chilimo Forest, Central Ethiopia

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ABSTRACT

We examined the changes in forest status and people's livelihoods through building future scenarios for Chilimo Forest in Central Ethiopia where participatory forest management (PFM) is being implemented. Participatory methods were employed to collect data, and a dynamic modeling technique was applied to explore trends over time. By integrating the more quantitative model outputs with qualitative insights, information on forests and livelihoods was summarized and returned to users, both to inform them and get feedback. A scenario of open access without PFM provides higher income benefits in the short term but not over the longer term, as compared to a scenario with PFM. Follow up meetings were organized with national decision makers to explore the possibility of new provisions in the national forest proclamation related to joint community–state ownership of forests. Project implementers must constantly work towards improving short term incentives from PFM, as these may be insufficient to garner support for PFM. Other necessary elements for PFM to succeed include: ensuring active participation of the communities in the process; and, clarifying and harmonizing the rules and regulations at different levels.

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1. Introduction

Severe rural poverty and natural forests often coincide in developing countries (Angelsen and Wunder, 2003; Sunderlin and Huynh, 2005; Sunderlin et al., 2005). Research on the forest–poverty link has questioned the simplistic links between poverty and forest degradation but recognizes poverty as among the causal factors (Sunderlin et al., 2005). The forest–poverty link is heavily influenced by access to and control over forest resources of communities in general, and the poor in particular (Wollenberg et al., 2000; Lynam et al., 2002; Angelsen and Wunder, 2003). In many developing countries there have been state failures in

ensuring property right regimes that allow farmers to equitably share the benefits and responsibilities of managing forests (Melaku, 2003). Clearly defined resource boundaries and management rules, properly recognized rights to access with graduated sanctions for misappropriation or failing to accomplish agreed tasks, and rapid and low cost conflict resolution mechanisms are important elements for effectively managing forests (McKean and Ostrom, 1995).

Realizing the shortcomings of traditional top-down state forest management has led to involving local people in forest management during the last two decades (Kiss, 1990; Arnold, 1998; UNASYLVA, 1998; Bruce, 1999; DFID, 1999). Community forestry, community-based natural resource management, joint forest management, collaborative management, adaptive co-management and participatory forest management (PFM) are terms used to describe a new set of varying and evolving relationships between the state (usually through forest departments) and people living in and close to forests and woodlands (Hobley, 2005). In this paper the

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term PFM is used to describe the system where communities living closest to forests and woodlands, and local government authorities work together to make decisions in all aspects of forest management, from (co-)managing resources to formulating and implementing institutional arrangements.

Much of the earliest experience that served as the precursor to PFM was gained mainly in India and in Nepal. The objectives of these initiatives during the 1980s and 1990s were to meet local needs equitably and sustainably, and to empower communities to make decisions (Hobley, 2005). A growing number of environmentalists and activists have called for local control as a means to better protect natural resources and improve local livelihoods. National governments were also interested in devolving authority so as to reduce budgetary costs of protecting forests (Wily, 2001; Hobley, 2005). PFM in Africa is evolving and shifting away from strategies that locate communities as subordinate beneficiaries, receiving a share of access, products or other benefits, into positions where they themselves regulate this source of livelihood. Involving and working effectively with community institutions facilitates the use of local people's knowledge about their environment, helps to better manage the behavior of resource users, and to integrate customary social structures into the resource management regime (Husain and Bhattacharya, 2004). These advantages led many developing countries to change their legislation to institutionalize PFM (Schreckenber et al., 2006) though variations in the motives for and forms of PFM result in great variability in institutional arrangements.

One challenge in PFM is to actively involve all stakeholders and ensure that they equitably benefit from forest goods and services, without compromising long term resource and development goals (Sayer and Campbell, 2004). Identifying and expanding forest livelihood options is another challenge. The conventional conceptualization of sharing of power and responsibility between the government and local resource users oversimplifies the challenges of PFM when it does not account for the ecosystem dynamics that provide the resources to be managed, the varying nature of relationships between the state and the community, and the complexity of the adaptive learning process (Sayer and Campbell, 2004; Carlsson and Berkes, 2005).

Since the mid-1970s the management of forest resources in Ethiopia was mainly carried out as state and community forestry programmes (EFAP, 1994). These non-participatory approaches failed to reduce tree felling and clearing, especially in Protected National Forest Priority Areas (Melaku, 2003). In response, alternative management approaches were initiated, primarily by NGOs, with the aim of introducing PFM in the protected forests (FARM Africa, 2000).

The PFM project at Chilimo National Forest Priority Area is one of four such projects recently initiated in the country. Local communities at Chilimo have organized themselves as forest users groups (FUGs) and concluded an agreement with the District Agricultural and Rural Development Office (DARDO) to manage the forest based on Proclamation No. 72/2003 (Art. 6, Sub art. 2 & 3) of the Council of the Oromia Regional Government that allows for transferring the management responsibility of forests to local communities. A total of eight FUGs were established around Chilimo-Gaje forest. Later organizing FUGs into cooperatives was taken as the best option to ensure that these community organizations have legal status. The cooperative by-law is based on formal rules and regulations of establishing cooperatives (Cooperatives Proclamation No. 147/1998). This paper focuses on one of the FUGs, the Chilimo FUG, which became the first cooperative to manage protected and planted forest resources. Chilimo Forest is also the first natural forest in Ethiopia managed by a cooperative. Though better outcomes in terms of reduced deforestation rate and improved incomes were reported, it was important to examine options that in

the long term would minimize trade offs and maximize synergies between conservation and livelihoods. The purpose of this paper is to examine the future contribution of the Chilimo Forest to people's livelihoods, with and without PFM scenarios, and to identify challenges to promoting PFM. Accordingly, the research questions were: (a) Can Chilimo Forest provide people with an equitable and a sustainable stream of net benefits greater than those under a non-PFM situation? (b) Are the existing rules and regulations favorable to positive livelihood and conservation outcomes?

2. The study area

The Chilimo Forest is one of the 58 National Forest Priority Areas of Ethiopia. It is located some 100 km southwest of Addis Ababa, between 38°05'E to 38°15'E and 9°00'N to 10°08'N, with elevations ranging from 1700 to 3200 m a.s.l. The forest represents the remnants of the dry Afro-montane forests in the central plateau of Ethiopia. The main species in the canopy layers are *Juniperus procera*, *Podocarpus falcatus*, *Prunus africana*, *Olea europaea* subspecies *cuspidata*, *Hagenia abyssinica*, *Apodytes dimidiata*, *Ficus* spp., *Erythrina brucei*, and *Croton macrostachyus* (Melaku, 2003).

For over a century, Chilimo Forest was under State control. Since 1991, state control over the forest has weakened, and deforestation increased significantly despite its designation as one of the National Forest Priority Areas (NFPAs). Higher timber extraction rates along with grazing and farming pressure radically reduced forest cover. A survey in 1982 indicated an area of 22,000 ha. Aerial photographic analysis revealed nearly 50% reduction in forest cover between 1982 and 1994 (Melaku, 2003). Currently, the forest covers an area of 6000 ha, and is surrounded by vast areas of agricultural land. About 3000 households with an estimated total population size of 15,000 live inside and on the periphery of Chilimo Forest. FARM Africa began activities to promote PFM in Chilimo Forest with two objectives: conservation and sustainable management of the existing natural forest; and improvement of the livelihoods of the local community. The 2003 Regional Legislation on Forest Management allows for the devolution of management power and effective ownership status to local people when they organize themselves for forest management. FARM Africa facilitated the formation of 11 forest users groups (FUGs), nine of which have already been allocated forest land from the total of 3800 ha. Chilimo is one of these FUGs. Transferring the ownership of the forest was made in 2004 when the district office legalized the by-laws of FUGs, clarifying the responsibilities of FUGs in developing, utilizing, and protecting the forest. As FUGs do not have legal status, organizing them into cooperative societies was taken as the best option for them to have legal status. When this process was finalized in 2004, the cooperative initiated management of a total area of 791 ha, of which the forest area occupies 596 ha. Most of the villagers in and around the Chilimo FUG forest are descendants of migrants who came to work in the sawmills.

3. Approach and methods

3.1. Approach

Management of forests invariably involves different stakeholders who seek to satisfy multiple and often competing objectives using resources that are both spatially and temporally variable (Sayer and Campbell, 2004). System dynamic models can be used to conceptualize and examine the interactions of components of systems across different scales and times (Sterman, 2000). Ensuring active participation of stakeholders while building such models facilitates understanding their objectives in managing resources and building on their knowledge about the local environment and its trends (Sayer and Campbell, 2004). Modeling through scenario

building plays an important role by simulating various courses of action to achieve desired outcomes. It is the first step in the lengthy process of identifying management strategies that are likely to help us achieve desired results. Participatory modeling seeks to clarify problems and improve communication among stakeholders, facilitating the screening of management or policy options to eliminate unworkable solutions, and helps identify critical knowledge gaps (Lynam et al., 2002).

3.2. Methods

The study was centered around a 2-week workshop involving 19 researchers from numerous disciplines. It involved data collection, model building and stakeholder engagement. It was followed by smaller policy dialogue meetings. The future of the forest and the viability of participatory forest management were examined using modeling. This paper largely focuses on two scenarios: with and without PFM. Other scenarios were also investigated (including those related to levels of agricultural production, human population scenarios and types of plantation management) but are not presented here for sake of length. As PFM is relatively new in Ethiopia, there are still many questions about its likely success. By focusing on these scenarios we planned to stimulate discussions from local to national levels to improve outcomes for people and forests.

Data was collected, largely through key informant interviews, on farm size, crops grown, livestock reared, average crop and livestock yield levels per household, forest-based income, percent of production consumed and sold, income sources and amounts from non-farm activities, and farm gate prices of inputs and outputs. The selection of key informants was made from different wealth categories and age groups, and also covered both members and non-members of the Forest Cooperative. Information so collected was used to build and feed different sectors of a model that was created during the workshop using STELLA software version 8. Components of the model (Fig. 1) were: major drivers of change (rainfall and population), the different categories of income (forest, crop, livestock, off-farm), and the growth and dynamics of different types of forests (plantations and natural forest).

The trend of the average household income was used as an indicator of the performance of PFM for achieving livelihood outcomes. The model simulated income and other variables over a period of 30 years. While calculating agricultural income, estimated farm gate prices were used and the calculation of income considered barter, gift, loan, subsistence, and cash income. The net income was calculated after cost of production (disregarding labor cost) was subtracted. The model was built for an average farmer whose farm size is currently 1.4 ha; with a cropping pattern of wheat (0.30 ha), *teff* (0.30 ha), barley (0.30 ha), *enset* (0.25 ha), and maize (0.25 ha); with estimated annual production of 0.35, 0.20,

0.20, 0.40 and 0.25 tons/household respectively (all data from key informant interviews). Annual rainfall (a random variable based on the mean and standard deviation of rainfall) influenced crop production levels, while population growth slowly decreased average field sizes. All barley and *enset* production was assumed to be consumed, while 40%, 20% and 25% of maize, wheat, and *teff* was considered to be marketed, with transport costs and crop losses accounted for. An average farmer owns about five cattle, three sheep, two equines and two chickens, which generate a variety of subsistence and tradable products. While calculating the wage labor rates earned, the estimated price of free lunches and drinks was added to the payment per day. When calculating forest income, annual production of construction wood from eucalyptus and cypress were estimated by foresters based on the existing forest management plan at 115,540 m³ (58.08 ha times 198.7 m³/ha), and 11 741.4 m³ (40.7 ha times 288.49 m³/ha), respectively. Annual production of fuel wood from eucalyptus and cypress was estimated at 3032 m³ and 2420 m³, respectively. Production of fuel wood from natural forest was estimated at 2497 m³ per year assuming 994 trees per hectare and an extraction rate of two trees per hectare per year. As no new fields were used for crop farming and as crop fields are free of trees, interaction between trees and crops were considered marginal, and were not accounted for in the model. All income is reported in Birr. At the time of the survey (April 2005), the exchange rate was 1 USD = 8.6 Birr. The comparison of the scenarios with and without PFM involved a series of assumptions (Table 1).

In undertaking the fieldwork, other groups of researchers focused on more qualitative aspects: (a) conflict and its management; (b) the institutional framework for natural resource management; and (c) history of forest use, but the details will be reported elsewhere. Discussions were undertaken with selected key informants, cooperative members, and villagers to disseminate results and get feedback. Two major feedback workshops were held in Chilimo: one with villagers, and another with representatives from various organizations (Chilimo Cooperative, appropriate government offices, and FARM Africa, the NGO implementing PFM in the area). Through a series of informal and formal meetings, the findings of the study were later used to inform national policy makers about institutional arrangements needed for community forestry.

4. Results

4.1. The implications of participatory forest management for forest resources

Prior to PFM, the forest was protected by the government, and people exploited the forest resources through illegal cutting and pit sawing. Firewood sales were rampant. After the Chilimo

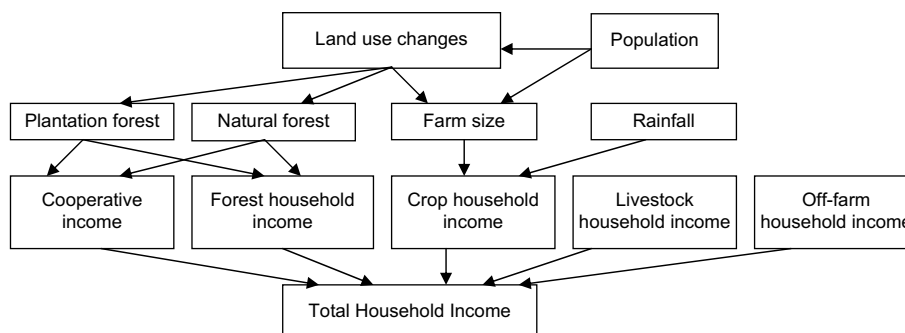


Fig. 1. The basic components of the model.

Table 1
Assumptions in studying the trend of with and without PFM scenarios

Parameters	Assumptions	
	Without PFM	With PFM
Forest status	5% loss of plantation area and 2% loss of volume of natural forest annually as has occurred historically	No loss
Forest income	No seed sales from natural forests	Annual seed sale from natural forests organized by the cooperative
	80% of households trading fuel wood as has occurred in the past	30% of households trading fuel wood as the cooperative allows the most destitute members to trade
	No replanting of plantations	All areas cut are replanted
	5 trees/ha cut illegally from plantation areas	No trees are cut illegally
Fuel wood income	Increased because of illegal cutting and sale	Regular but lower fuel wood sale income
	Current level of productivity	100% increase in productivity (due to NGO interventions)
Crop income	No cooperative income	Annual income from the cooperative as determined by income derived from forestry activities

FUG cooperative was formalized, villagers and state authorities have noted a significant reduction in illegal activities. While non-members felt dispossessed, cooperative members reported changes in their attitude towards the forest resources since they took responsibility for the forest. Only those people who are considered very poor are allowed to collect and sell fuel wood. They have to collect the wood, only twice a week, and they pay a monthly fixed fee to the cooperative. Others are allowed to collect firewood only for their own consumption. The use of other wood products is decided by the Cooperative Executive Committee. Cooperative members believe that the forest is now better managed and cite increasing wildlife populations, better regeneration and reduced conflicts between community and the State as success indicators of PFM.

The impact on the forest volumes of PFM is simulated in Fig. 2. Without PFM, it is assumed that the *Eucalyptus* and *Cupressus* plantations will be rapidly depleted. Because of PFM the simulation

suggests that the natural forest is recovering, while without PFM the recovery would be arrested; once the plantations have been decimated, the natural forest will be rapidly depleted. The level of destruction could well be faster without PFM, as the model probably fails to account sufficiently for extraction by external woodcutters and traders.

4.2. Household income: current status and future trends

Socio-culturally the community is not heterogeneous, though variations in wealth status are noticeable. The livelihood of the majority of households is derived from agriculture and forest products. Land allowed for farming and grazing within the forest has long been limited, and the villagers are faced with a growing problem of land fragmentation and landlessness. Currently 20% of households are defined as functionally landless. With the PFM project, interventions are underway to promote irrigation for enhancing vegetable and fodder production, and poultry and sheep farming. Villagers identify land shortage, crop damage by wild animals, and the high cost of inorganic fertilizer as the main constraints to agricultural production. There are inadequate social services, especially the lack of a school nearby. Villagers emphasize the need for diversifying livelihoods to increase household income but recognize that doing so without causing decline in forest resources is a challenge.

4.2.1. Current income levels for households and the cooperative

Forest products account for about one-third of total household income, followed by income from livestock and crop farming (Table 2). Much of the cash income is earned from the sale of livestock, vegetables, and *enset* (false banana). Some households are also engaged in non-agricultural activities and a few others get remittances. The income from the forest (Table 3) is derived directly from the forest mainly through firewood and honey and indirectly from the cooperative as payments (derived from plantation timber sales).

The cooperative obtains income from a variety of sources. According to the agreement that the cooperative entered into with local authorities, 30% of forest plantation income goes to the government as tax, another 30% is divided amongst the members, 20% is used for community social services development works, and the remaining 20% is kept as capital for investment and for financing the activities of the cooperative. The total expenses and gross income for the 2004/2005 fiscal year were, respectively, Birr 132,333 and 176,896 (Table 4). The bulk of the income came from the sale of *Cupressus* wood.

The *Cupressus lusitanica* and *Eucalyptus globulus* stands have reached harvestable size. But the existing management plan does not allow cutting all mature trees fearing that this will not make an evenly distributed income to the cooperative in future years. The STELLA model outputs indicate that while the income from plantations is substantial, the annual fluctuation is high. This will continue until the forest is gradually brought to a structure that allows for a sustained yield, i.e. when the area planted annually is not less than the area harvested each year.

Table 2
Estimated average annual household income of a cooperative member in 2005

Income type	Cash (Birr)	Subsistence (Birr)	Total (Birr)	Percentage
Crop	202	809	1011	29.2
Livestock	607	469	1076	31.1
Forest	686	549	1235	35.6
Off-farm	141	–	141	4.1
Total	1636	1827	3463	100

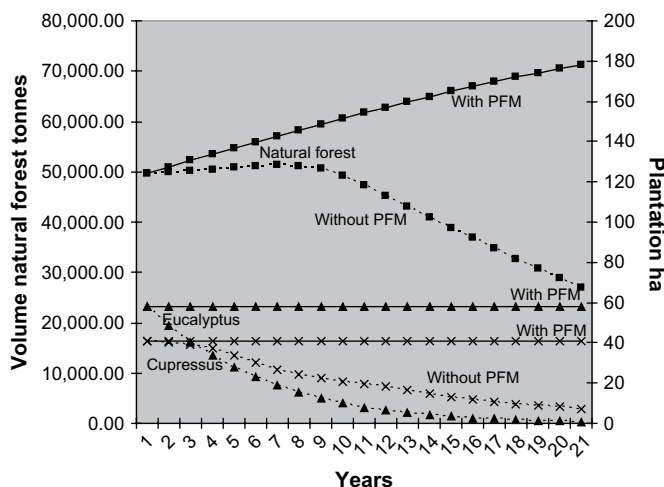


Fig. 2. The trend of forest volumes in Chilimo with and without PFM.

Table 3
Estimated average annual household income from forest-based activities

Income type	Cash (Birr)	Subsistence (Birr)	Total (Birr)
Income from cooperative from sale of plantation timber	209	–	209
Logging and loading wages	65	–	65
Construction wood	–	104	104
Fuel wood	181	229	410
Honey	209	90	299
Forest tree seed collection and sale	22	–	22
Wild foods	–	127	127
Total	686	550	1236

4.2.2. Household cash income trends

Incomes from livestock and off-farm activities do not vary much between the with PFM and without PFM scenarios. But there is a significant increase in agricultural income with PFM. This increase in income comes partly from increased social and marketing services provided to members by the cooperative, and partly through the extension service and support of FARM Africa for vegetable farming. Concerning income from the forest, the model output shows that with PFM, villagers will have varied sources and more sustained cash income from the forest only in the medium and long term. In the short term, forest income without PFM is higher than with PFM (Fig. 3a and b). This is because open access will lead to a three-fold increase in income from the sale of fuel wood alone.

However, this does not necessarily mean all the community will benefit from the forest resource without PFM. Open access is likely to benefit a small portion of households, perhaps the better off households as they have the resources and the networks to extract and market the forest products. Villagers around the forest and people coming from nearby towns will likely be involved in cutting of timber trees and selling of fuel wood.

4.2.3. Subsistence income trends

Subsistence income from agriculture is simulated to be about 11% higher without PFM than with PFM as forest lands are likely to be converted to crop fields. Besides, income from illegal wood sales could be used to buy agricultural inputs that increase yield. Fuel wood subsistence income is simulated to decline significantly without PFM due to loss of forest. All other sources of subsistence income from the forest are shown to be sustained in the case of PFM (Fig. 4a), while all sources decline sharply in the case of non-PFM (Fig. 4b).

4.2.4. Total household income trends

Up to the seventh year, total household income is simulated to remain higher without PFM than with PFM (Fig. 5). But after that the trend reverses as open access will have significantly reduced the forest resource, and total household income becomes higher

Table 4
Major income sources and expenses of the Chilimo Cooperative in 2005 (interview data)

Income	Birr	Expenses	Birr
Sale of <i>Eucalyptus</i> wood	31725	Government tax	47750
Sale of <i>Cupressus</i> wood	127440	Payment to members	47750
Tax from fuel wood sellers	5625	Social services expenditures	31832
Sale of forest tree seeds	7920	Forest tree seed purchases	5000
Ecotourism income	1000		–
Interest from saving	4111		–
Total	177821		132332
Net income			45489

with PFM than without PFM. In both scenarios, the decline in income over time is attributed to an increase in the number of households in the area and the absence of new income generating opportunities.

4.3. Managing conflicts and clarifying rules and regulations

Conflicts, disagreements and dispute over access to and control over natural resources are common where there are resources that are managed and utilized by groups of people (Matiru, 2000). Some suspect that lack of recognition of conflicts is a factor in the failure of many PFM projects (Skutsch, 2000). Besides involving everyone affected in the decision making process and clarifying the rules and regulations, opening up means of discussing potential sources of conflicts and adopting inexpensive mechanisms to resolve conflicts, even minor ones, are essential for PFM to succeed. PFM at Chilimo Forest has helped solve at least some of the previous conflicts, e.g. between government guards and illegal loggers, between guards and the surrounding community when collecting fuel wood and fodder, and between long standing local residents and more recent settlers. So far there have been no serious conflicts amongst members of the cooperative and between members and non-members, though there are very few non-members. But some aspects require special attention to avoid future conflicts and to increase the chance of success of PFM. These are discussed below.

The major rules and regulations that influence the management of Chilimo Forest include the Federal Government Proclamation (No. 94/1994), the Oromiya Regional Government Proclamation (No. 72/2003) on the management of forests, the Federal Government Cooperative Proclamation (No. 147/1998), the Forest Management Agreement signed in 2004 between the Chilimo FUG and the District Office of Agriculture and Rural Development that transferred the user right to the FUG based on specified conditions of management, the internal by-law of the Chilimo Cooperative which is based on the Cooperative Proclamation, and various customary rules. There are gaps in the coherence and compatibility of regulations at different levels. At Federal level, for example, proclamations governing natural forests and those for establishing and legally recognizing cooperatives are not complimentary. The first puts emphasis on the need for the conservation of natural forests through an agreed upon management plan while the cooperative legislation encourages cooperative members to use their resources so as to maximize incomes. At the district level, the Natural Resources Office, responsible for defining and checking on the management of the forest, and the Cooperative Promotion Office, mandated to assist the establishment and legalization of cooperatives, are operating based on these two proclamations. This results in lack of consistency and a common vision as to how the forest resources could be managed by the cooperative. Thus reconciling major proclamations, and combining the cooperative by-law and the internal by-laws into a single consolidated and coherent legal document may facilitate their enactment. Such documents have to be continuously assessed and adapted to better govern forest–people relationships.

The Chilimo FUG does not have legal status and membership is inclusive. It is defined in terms of socio-spatial arrangements. Every member is entitled to secure free access to specified forest products and services. Similarly, every member is obliged to participate in the protection and development of the forest. In contrast the Chilimo Forest Cooperative does have legal status and membership is exclusive. Although it is open to all FUG members, the rules oblige the prospective member to meet certain requirement such as capacity to pay the registration fee and to accomplish certain obligations such as guarding the forest. Thus not all FUG members are members of the cooperative. The cooperative law is very rigid

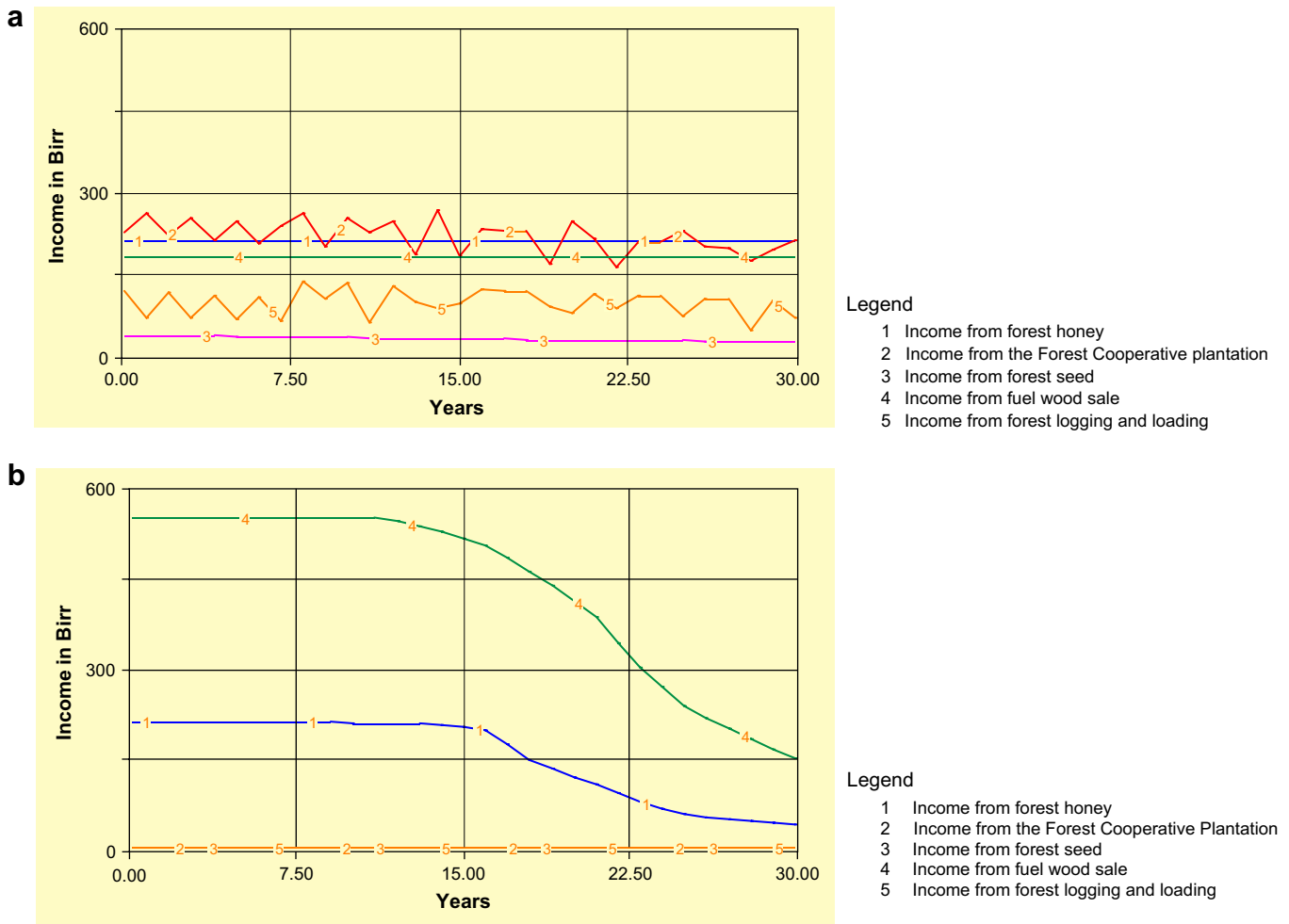


Fig. 3. (a) The trend of household forest cash income in Birr with PFM. (b) The trend of household forest cash income in Birr with out PFM.

and recognizes the forest resource as the exclusive property of cooperative members, disenfranchising non-members who are largely very poor and old members of the community. Accommodating their use right goes with the moral values of the society but existing cooperative by-laws are not yet adapted to accommodate such needs. No efforts are being made to adapt the existing cooperative model to a cooperative that manages natural forests. Nevertheless, cooperative level by-laws were better implemented and observed than higher level laws and were more effective in minimizing the former *de facto* open access to the forest.

The by-laws governing access to forests and the customary rights need to be reconciled. Some villagers are unhappy with the restrictions that the cooperative has imposed. People need to participate in rule-making processes, and this facilitates enforcement of rules on the ground. Electoral and benefit sharing rules are not clear for many. Many members see their participation in planning activities as inadequate. Some doubt that there are fair mechanisms for accessing credit support schemes introduced by FARM Africa, and for the distribution of income from sale of plantation timber. There are also spatial location issues that require careful attention to avoid future conflicts. Irrigation is benefiting only those close to the water points. Wild animals attack the crop fields and livestock of farmers near the core forest areas more frequently than those that are further away. These households allocate more time to guard the plots and invest more to build fences. In some cases they

even change the types of crops they grow. If there are members that are not benefiting from the development of irrigation schemes and if those that are affected more by the wild life are not compensated for losses, this is likely to create conflict. Democratic and inclusive electoral processes and planning processes, and transparent and equitable modes of benefit sharing help to build trust in the management of the cooperative.

4.4. Discussions with farmers and local officials

Farmers have generally agreed with many of the findings presented to them. Villagers contested the findings of the model regarding lower income in the short run with PFM as compared to without PFM. They felt that they are doing their best to protect the natural forest and to better manage the plantation, and thus income from the forest cannot be lower under PFM. Perhaps the model needs to better reflect the impacts of external agents on the forest, as it may be the external agents and the Chilimo elite (the wealthy and those connected to leadership positions) that capture the benefits of rapid liquidation of the forest. As the land area is limited and there are no options for expansion, farmers realize that income per household would considerably decline unless they start to strategically plan for the future and identify other income generating opportunities.

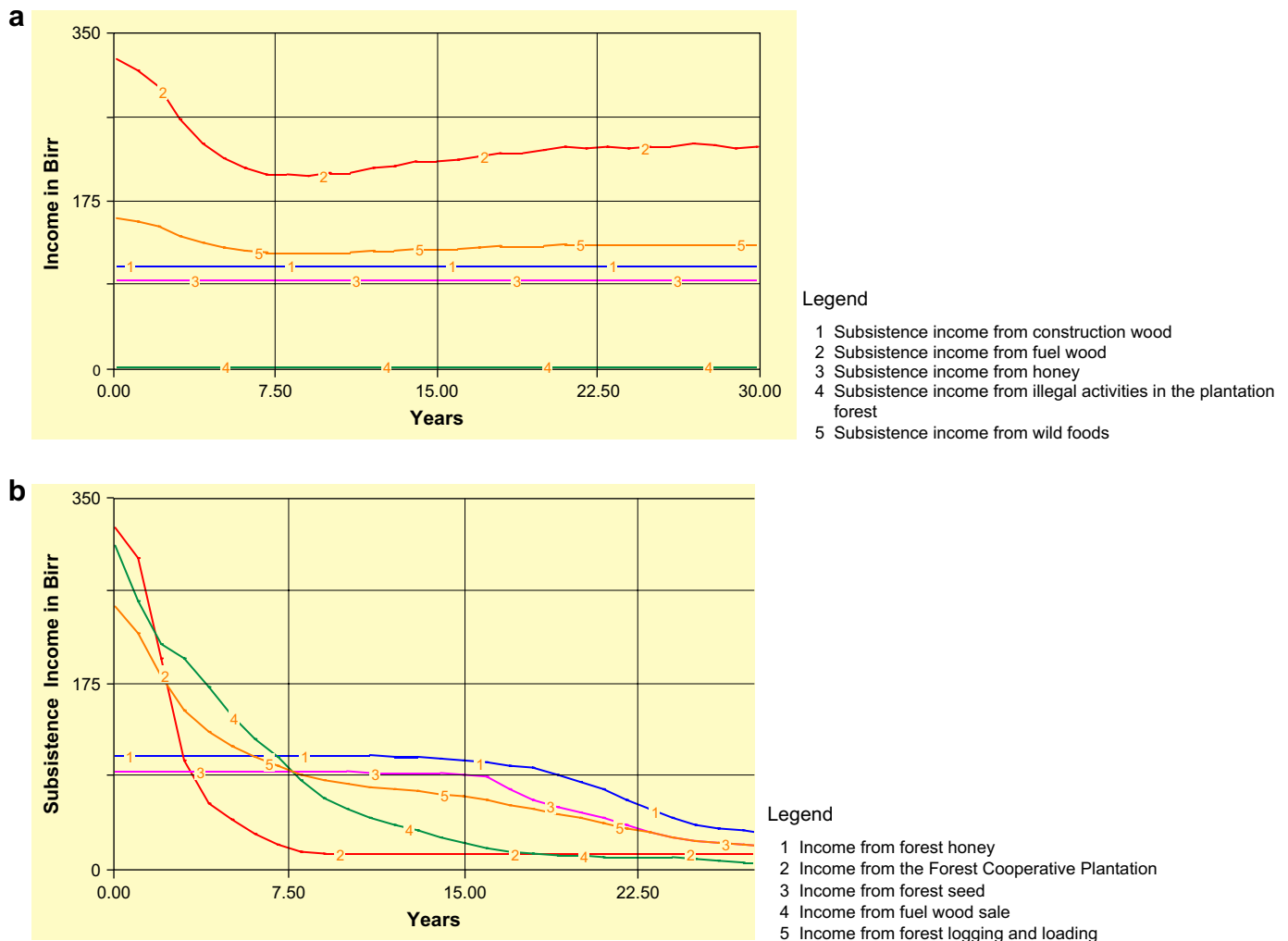


Fig. 4. (a) The trend of household forest subsistence income in Birr with PFM.

Many villagers believe that the role of Chilimo Forest in improving people's livelihoods will continue to be important under PFM. The main reasons given were:

- The natural forest area will increase in quantity and quality due to improved natural regeneration, filling gaps, including on trails and in patches of lands used previously by livestock.
- The area under plantation will also increase as open lands will be used for tree planting as income from trees and tree products is promising.
- Incomes from non-farm activities, forest products and irrigation based vegetable farming will increase while the proportion of household income to be obtained from field crops and livestock production will decline. But farmers may be over-optimistic. For example, plantation is not easy and there is a question as to whether the cooperative has the ability to achieve a high level of replanting.

Reduced deforestation, increased regeneration, effective enforcement of regulations and empowerment of local people were identified by villagers as positive outcomes of PFM. Highly restricted forest access to non-members, further marginalization of the poor, households headed by women and the aged, unequal involvement of all members in decision making processes of the

cooperative, and increased wildlife attack on crop and livestock were reported as negative outcomes. If PFM is to succeed, the negative outcomes must be addressed and opportunities for increasing income from the forest and for ensuring an equitable share of benefit and responsibility have to be explored. This requires managing competing claims over the forest and clarifying rules and regulations to better manage conflicts.

Discussions with officials helped to realize the lack of coherent working relationships among concerned departments (Natural Resources and Cooperatives Departments for example), and the inadequacy of local government support to communities managing the forest. It was agreed that transparent processes of developing local by-laws, making those laws known to all concerned, enforcing those by-laws, and maintaining frequent communications with district officials would help. Experts of FARM Africa emphasized inadequate federal legislation and insufficient enforcement at local level. In addition, they disputed the model outputs relating to agricultural income arguing that their interventions had had major impacts on productivity. Their feedback initiated further fieldwork to get additional data and some changes in the model assumptions. The challenges of using the cooperative organizational model, taken from the agricultural cooperative model, for managing forest-people relationships were acknowledged. The need to involve higher policy makers in policy dialogue to address the need

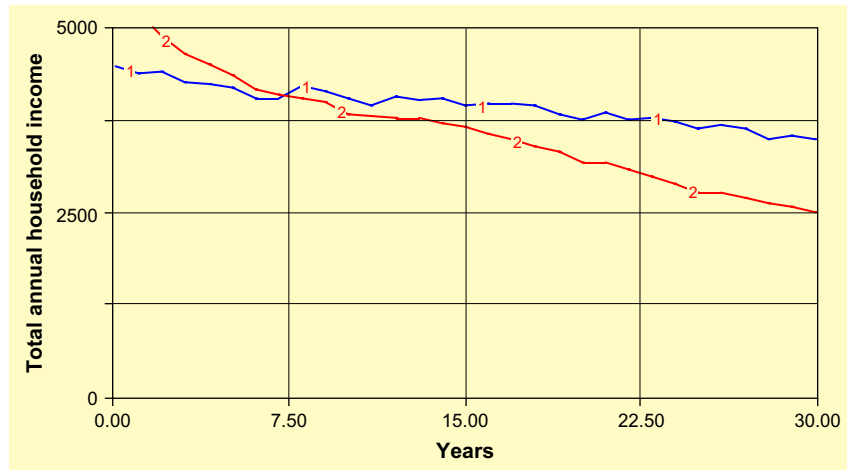


Fig. 5. The trend of average household income with PFM (1) and without PFM (2).

for legally recognizing joint state–community ownership of forest lands was agreed upon.

4.5. Follow up discussion at national level

Successive informal meetings in the capital Addis Ababa led to a formal meeting with key national level policy makers to discuss the content of new forest legislation that is to be tabled in Parliament. The findings from this study and evidence from related studies were presented to illustrate the existence of legal loopholes. The policy makers clearly saw the gaps and agreed to include articles in the legislation to bridge these gaps. The proposed articles in the new legislation would facilitate the adoption of PFM as joint state–community management of forests will be legally recognized. Thus far only private and state ownership of forest lands has been recognized by law. Some regional governments are drafting laws to recognize joint state–community ownership. The lack of legal recognition of joint ownership had undermined the promotion of PFM in state owned natural forests. So far PFM has been applied in only four of the 58 national forests. When the new legislation is approved, it will be easier to introduce PFM in the remaining state owned and managed National Forest Priority Areas of the country.

5. Discussion

The problems related to PFM include the state agencies trying to retain control over management decision making, weak accountability of local institutions (with the possibility of resource capture by elites), growing inequalities of access by disadvantaged and marginalized members of the community, and the opportunity costs associated with restricted access to the forest resulting in negative short term returns. These are commonly observed problems in a number of PFM initiatives elsewhere (Shackleton et al., 2002; Campbell and Shackleton, 2002; Campbell et al., 2001; Shyamsundar, 2005; Campbell, 2006; Schreckenberg et al., 2006); if PFM is to succeed communities need to be defined in a more inclusive way (Wily, 2001), and the divergent interests of stakeholders within the communities need to be explicitly addressed.

Stakeholders of Chilimo Forest believe that PFM improved forest–people relationships as deforestation was reduced, regeneration rate increased, and farmers were empowered to manage the forests to earn income. Forest income constitutes an important part of household income, and much of it is obtained from the sale of plantation timber. While the income from

plantation is substantial, it fluctuates significantly. Intensifying agriculture and diversifying livelihood options will help reduce pressure on the forest. Options include adding value to forest products, improving plantation management, improving the bidding process for the sale of plantation timber (better valuation of the wood volume and advertising widely), and exploiting opportunities for eco-tourism, legal hunting and the sale of wild animals.

If income from the Chilimo Forest is to continue, the capacity of the cooperative must be strengthened, especially its technical, managerial and administrative capacity. The cooperative should serve as a learning platform to better manage forest–people relationships, and a basic need is to improve the quality of local participation. Existing rules and regulations and cooperative by-laws have not yet been adapted to accommodate the management of natural and planted forests, though the state is now attempting to improve the legal framework. The local authorities must realize that their roles have to change in PFM, and appropriate levels of involvement of the different stakeholders should be spelt out, especially between the state and the communities. If not, the role of the state may even be strengthened in controlling local resources (Edmunds and Wollenberg, 2003). There are still many elements of command and control, and there is room for increasing the participatory content. As Campbell and Shackleton (2002) noted, the greater authority organizations at community level have, the more likely they are to succeed. The state can also assist the community in identifying problems and solving them, mainly by playing an arbitrating role between groups with divergent interests. The state should also monitor livelihoods, as it does changes in the status of the forest, in order to learn how to improve the status of forests while at the same time improving people's livelihoods. Finally, for lessons from PFM in Chilimo to be drawn and replicated elsewhere, experiences relating to institutional and legal arrangements need to be properly documented. Options that open the door for legally recognizing joint community–state ownership rights, and according legal status of community-based organizations and further experiments with organizational models need to be stimulated as a cooperative model may be far from ideal. Elsewhere there is positive experience regarding trusts and conservancies. Learning from these experiences can be used to initiate dialogue with policy makers to reformulating and harmonizing existing rules and regulations governing the forestry sector and to clarify the modalities and requirements of scaling up PFM. The experiences reported here indicated some commitment by the state to improving forestry.

6. Conclusions

The initiative of PFM in Ethiopia began with NGOs that are experimenting with more participatory approaches. While non-participants felt that their rights over the forest have been eroded, participant households and experts felt that PFM improved forest–people relationships. Forest income constitutes an important part of household income, and much of it is obtained from the sale of plantation timber. The model outputs on household total cash income showed that in the short term, income without PFM is higher than income with PFM. But this income will decline sharply as open access will lead to over exploitation of the forest in a short period of time. With PFM, forest income will be higher and consistent but only in the long term. If income from the forest is to continue, the capacity of the cooperative must be strengthened, especially its technical, managerial and administrative capacity. Existing rules and regulations and cooperative by-laws have not yet been adapted to accommodate management of natural and planted forests. In addition, the clarity and coherence of rules and regulations at different levels and the existing gaps in by-laws must be addressed to accommodate changing realities of livelihood options and forest conditions.

There are many recent studies that suggest that achieving win–win situations for conservation and livelihoods is proving difficult for conservation and development agencies (Adams et al., 2004; Naughton-Treves et al., 2005; Agrawal and Redford, 2006). The Chilimo Forest case indicates that a win–win situation may indeed be possible. If the current community-based arrangements and activities are maintained, the long term livelihood outcome is better than in an open access situation, indicating that devolved natural resources management remains an important development strategy (Shyamsundar, 2005; Campbell, 2006). However, the current win–win situation may not necessarily lead to poverty reduction (reduced number of people in poverty); rather it limits further slides into deeper poverty (Sunderlin et al., 2005). In addition, project implementers have to be cognizant that short term incentives may result in a lack of support for PFM, and thus must constantly work towards improving short term incentives.

One has to question whether the current situation is sustainable. Is the pro-conservation attitude of communities a consequence of having plantation timber and associated cash income at their immediate disposal? What will happen if the plantations are degraded? Can the transaction costs associated with community-based activities (borne by the NGO) be reduced to facilitate sustainability? How can the role of local level institutions be legally strengthened to guide community-based activities in natural resource management and help reduce such costs? Should the NGO focus also on capacity building and facilitating roles as part of its exit strategy? Unless the policy and legal frameworks create an enabling environment to strengthen the local institutions, they could collapse (fragility of community-based institutions has been demonstrated by Campbell and Shackleton, 2002).

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