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Factors influencing level of participation of community forest associations in management forests in Kenya

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ABSTRACT

In Kenya, a Participatory Forest Management (PFM) approach was adopted through formation of Community Forest Associations (CFA) to improve forest cover and their livelihoods as provided for in the Forest Act 2005. The main objective of this study was to determine the factors influencing the level of CFA members' participation in PFM activities in selected forests in Kenya. The study was undertaken on the Ontukigo and Ngare Ndare CFAs involved in participatory management of the Ontulili and Ngare Ndare forests respectively, located in the Eastern Conservancy, Buuri Sub County (Meru County) in Kenya. Semi structured questionnaires were administered to randomly selected 80 CFA and 80 Non CFA members. Participatory Rural Appraisal tools, including focused group discussions and community wealth characterization, were used to collect qualitative data for precise description of the quantitative data. The level of participation of CFA members in PFM activities was positively and significantly influenced by the level of perceived PFM benefits ($\chi^2 = 38.73$, $P=0.05$); range of farm size ($\chi^2=12.72$, $P=0.05$); and nature of the head-of-household ($\chi^2 =29.99$, $P=0.001$). As such, benefits gained from the forest play an important role as incentives to community participation in PFM.

KEY WORDS

Community; forest associations participation; Participation; livelihoods; benefit; access

Introduction

Participatory Forest Management as defined by the National PFM guideline is 'a forest management approach, which deliberately involves the forest adjacent communities and other stakeholders in management of forests within a framework, [and] which contributes to community's livelihoods' (Kenya Forest Service and Kenya Forest Working Group, 2007). The stakeholders are locally involved in management of a forest, which may be dry woodlands, tropical forests, mangrove or plantations, for the mutual benefit of both the species of flora and fauna and the community. Schreckenber, Luttrell, and Moss (2006) indicated that majority of the countries in Africa and Asia have been promoting the participation of rural communities in the management and utilization of natural forests and woodlands through some form of Participatory Forest Management (PFM).

In Kenya the formation of CFAs started in 1997. By July 2014, 98 management plans had been developed and 60 Management Agreements had been entered into between the Kenya Forest Service (KFS) and CFAs, in view of the 200+ forest stations in Kenya

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(Ayiemba et al., 2014). Studies have been undertaken to help understand how major CFAs in Kenya, such as the Arabuko-Sokoke Forest Adjacent Dwellers Association (ASFADA) and the Meru Forest Environmental and Protection Association (MEFECAP), operate given the challenges they face (Ongugo et al., 2007). However, community perceptions on the capacity of the CFAs to meet PFM objectives and their perception on how to enhance the PFM process have not been assessed in the forests of the Timau ward (Buuri Sub County) in Meru County, hence the need for this study.

Factors encouraging high level participation of community forest association members in making decisions and implementing activities related to PFM are very important. It is therefore important to understand such factors in order to enhance development and implementation of management strategies that are ecologically viable over both the long and short term while also being sensitive to the needs of community members living adjacent to such forests.

Although PFM was introduced in Kenya in 1990s and has been in progress in several state forests, no study has been conducted on factors affecting the level of CFA members' participation in PFM in these forests. This study was therefore proposed to determine factors influencing households' participation level in PFM selected forest. More specifically, the objectives of this study are to identify the demographic, biophysical and economic factors influencing the level of households' involvement in PFM, depict the magnitude of the effect of the variables and identify the key variables which policy makers will have to focus to improve the community forest management practices

Research objective

To determine factors influencing the level of CFA members' participation in PFM in Ontulili and Ngare Ndare Forests in Kenya.

Research questions

- (1) What is the level of participation of CFA members in PFM?
- (2) Why do the CFA members participate at this level?
- (3) What challenges do CFA members face in trying to maintain a high level of participation?

Methodology

Study area

This study was carried out at the Ontukigo and Ngare Ndare CFAs operating in Ontulili and Ngare Ndare forests, respectively. These forests are located in Buuri Sub County of the former larger Meru Central District, and it has two wards: Timau and Buuri.

The Ngare Ndare forest covers an area of 5554.3 hectares (54km²) and lies between 0°07'N to 0° 10'N and 37°18'E to 37°27'E. The forest is 2336 metres above sea level and 260 km from Nairobi through Nanyuki town. It is predominantly a dry cedar forest with an annual rainfall of about 450 mm occurring between March – May and November – December; its average

temperature is between 20°C and 28°C (Ngare Ndare Trust, 2008). Villages covered in the household survey included: Mbuju, Ngare Ndare, Suboiga, and Ethi.

The Ontulili forest is located within latitude 0.0666667° and Longitude 07.2833333°, about 15 km from Nanyuki town on the way to Meru. It is wetter than Ngare Ndare forest. The villages around Ontulili where the household survey was done include: Katheri, Lower Ngusishi, Upper Ngusishi, and Sirimon. These forests are part of the seven forests formerly referred to as the Mt Kenya forests, and they are located near Mt. Kenya National Park (See Figure 1).

Map Source: CETRAD (2011)

Buuri Sub County is partly lowland and semi-arid, it receives bi-modal rainfall pattern, with the long rains occurring from March to May and short rains from October to December. The sub county is near the Equator; variation in mean temperatures is minimal. Being in the leeward side of Mount Kenya, the Sub County lowlands receive between 380 mm and 1,000 mm annually. The major economic activity in the sub county is agriculture, with maize and beans being the major food crops. The cultivation of flowers and commercial vegetables is an important source of foreign exchange in this sub county. Livestock production is practised throughout the sub county (GoK, 2001). The population of Buuri Sub County was recorded as 109,803 people in the 2009 Census with a total of 32,393 households (KNBS, 2009).

Choice of site

Buuri Sub County has three forest stations, and each of them has a CFA working in partnership with the Kenya Forest Service (KFS). In the Ontulili Forest Station, there is Ontukigo CFA, which is composed of eleven community-based organizations. The CFA is registered, and management plan preparation process is underway. The Marania Forest Station has the Ntimaka CFA whose name originates from the three villages it covers, namely Ntirimiti, Marania, and Karuri. This CFA is registered with five CBOs but lacks a management plan. In Ngare Ndare forest station, there is the Ngare Ndare CFA, which is registered with six CBOs as members, and has a management plan in place.

The study was undertaken on the Ontulili and Ngare Ndare forest stations. The choice of these forests is because the two forests are part of Mount Kenya Forest, which is one of the five key water towers in Kenya. As such, many people depend on it for their livelihoods. Another factor considered is the fact that the two forests have different climatic and management conditions, with the former being a wet forest under plantation management, and the latter being relatively drier and under indigenous vegetation. Moreover, the Ontukigo CFA and the Ngare Ndare CFA have both embraced PFM while undertaking different activities. Thus it was considered necessary to assess the roles of the CFAs in management of the two forests and be able to present the differences in their capacities to meet PFM objectives of improving forest cover and community livelihoods.

Target population and sample size

A Purposive sampling technique was used to select CFAs working in the two forest sites, as it is the CFAs who possessed the required information with respect to the objective of

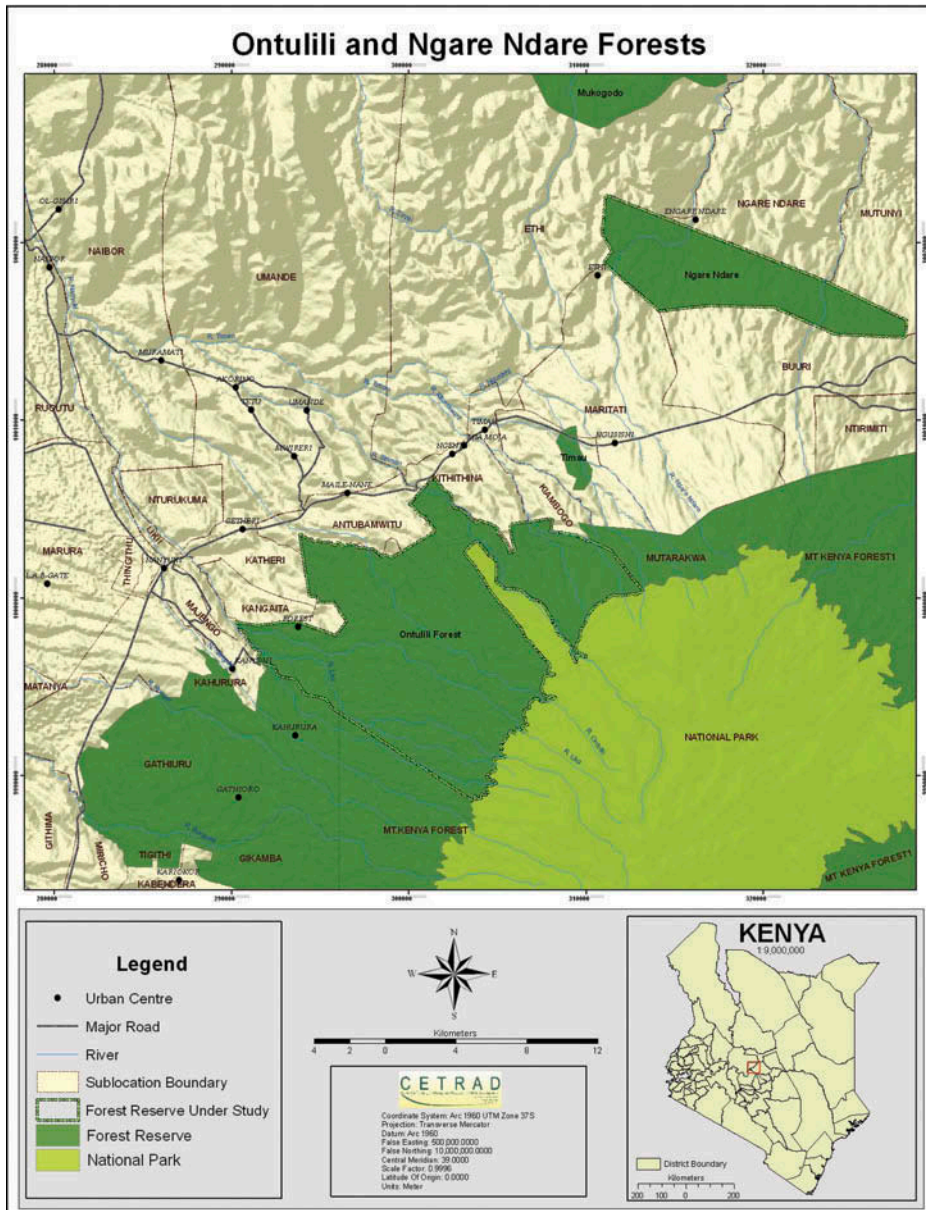


Figure 1. Location of Ontulili and Ngare Ndare Forests in Kenya.

this study. Focussed group discussions were held in each of the forest sites, with at least 10 members drawn from the CFAs adjacent to these forests to provide the needed information (Lelo et al., 2000). Interview schedules were administered to KFS staff, KWS, CFA staff, and other stakeholders' officials selected by use of a snowball sampling method (Mugenda & Mugenda, 1999).

For household interviews, the respondents considered for this objective were CFA members. Gay (1981) proposes that 30 cases or more are required for correlation research.

A semi-structured questionnaire was administered to 80 CFA members selected by a stratified random procedure from at least 4 randomly selected villages surrounding each of the two forests. Eighty households were interviewed around each forest site, giving a total of 160 households in both the Ontulili and the Ngare Ndare forest stations.

Data collection methods and instruments

The objective of this study was to assess the relationship between the level of participation of CFA members in PFM and their perceived benefits. This objective was addressed using the semi-structured questionnaire. Probing was done to obtain greater in-depth information (Mugenda and Mugenda, 1999). Wealth characterization was undertaken by a few of the community members living adjacent to each forest site, and each CFA member was attached a wellbeing rank by the interviewee based on wealth characterization done by the community members.

Results and discussion

Factors influencing CFAs' general level of participation in PFM

The CFA members' level of perceived benefits in PFM

Effective resource management as desired in PFM entails balancing benefit entitlements and responsibilities of managing forest resources. It is therefore important to determine whether there is any relationship between the levels of participation of the CFA members and their level of perceived benefits. A high level of participation was noted for high benefit perception (68.8%), while a low level participation (17.5%) was observed for low benefit perception (see Figure 2).

There was a strong positive association between the level of CFA participation and their perceived level of benefits (Gamma value = 0.978) and the relationship was significant ($\chi^2 = 38.73$, $p = 0.05$). This implies that an increased level of perceived benefits would generally lead to a higher level of participation. These findings are consistent with those of Coulibaly-Lingani, Svadogo, Tigabu, and Oden (2011) who noted that a majority of those participating in forest management programs in Burkina Faso were

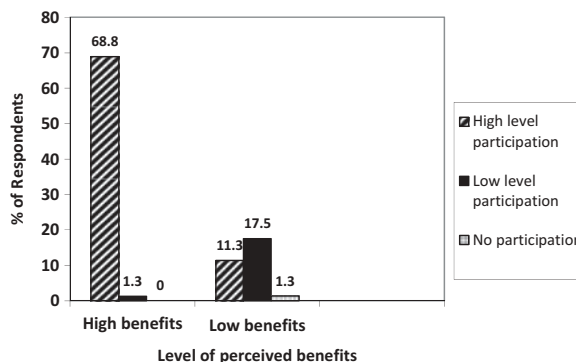


Figure 2. Levels of participation in PFM in relation to the level of perceived benefits.

those receiving direct benefits from participating in such programs. Dolisca et al. (2006) similarly observed that respondents who had benefited from Forêt des Pins Reserve in Ahiti were more positively inclined towards social, environmental, and economic participation. Environmental participation can be enhanced through providing opportunities for local people to increase incomes through participation, which implies that high forest dependency encourages participation in forest management. Lise (2000) also similarly concluded that the best chances of voluntary participation in forestry activities will be obtained from farmers who are highly dependent on the forest and who perceive the quality of the forest as good.

Degeti and Yemshaw (2003) noted that the level of benefits that people in Oromia region derived from the forest was directly related to their level of participation in forest management, especially benefitting from forest products and fodder for their livestock. Local consumption was noted to be the most important kind of benefit for the community members, followed by monetary benefits such as profits obtained through sale of forest products (e.g., firewood) and through ecotourism services (e.g., tour guiding, among others). A majority of the community members involved in PFM engaged in selling fuelwood and other products to generate additional income.

Temesgen et al. (2007) noted that what motivates communities to manage forests is the income from the resource. Therefore, sustainable forest management should have a clear focus on managing forest product supply and demand. The more products available and thus the more potential livelihood opportunities at a forest site, the easier it is to set up community based forest management. Participatory Forest Management should therefore ensure that the forest resources that are in high demand are grown in the forest.

The government should also work closely with the CFA members in developing income-generating activities within and off the forest, and these activities should be those that do not compromise the state of the forest cover. For forest adjacent communities, forestland represents one key source of environmental capital that stakeholders can use to build their set of livelihood activities. There is of course need for numerous sources of income in order to make forest management attractive and provide a sustainable foundation for successful PFM. A range of Non timber Forest Products (NFTPs) must be developed rather than relying on a single product, and their value also needs to be increased through organic or forest certification as well as niche marketing. Income sources such as eco-tourism and other environmental service payments need to be developed to ensure that agricultural land users do not outcompete forestland use (Wood, 2007) as it is currently in the communities adjacent to the Ontulili and the Ngare Ndare forests.

The government should not expect continued forest resource management participation from community members living adjacent to the forest without any form of incentive or benefits. As noted by Meinzen-Dick and Di Gregorio (2004), many governments are undertaking decentralization and devolution of programs to transfer responsibility for resource management to local governments and user groups such as CFAs after they have failed to effectively manage those natural resources centrally. Transferring the responsibility of forest resource management to local community organizations, such as CFA's, without transferring the corresponding rights is a common yet inefficient practice. Due to such occurrences, CFAs may lack the incentive and hence the authority—to manage the resource.

Range of farm sizes of CFA members

A high level of participation was observed for CFA members with farm sizes in the ranges of 0.6-2.0 acres and 2.1-5.0 acres. Considering the community wealth characterization, this implies that the most active CFA members were the poor and the rich (at times all considered as a middle income group), and very few of the ‘very poor’ and ‘very rich’ participated actively in PFM (Table 1). The average farm sizes for the CFA members with High (3.55 acres), Low (1.83 acres), and No participation (17 acres) display significant differences ($F=2.859$, $p=0.06$), though the one respondent exhibiting “No participation” had a very large tract of land.

In India, it was noted that a lack of productive assets such as land and livestock was associated with low levels of household influence in decision-making processes (Adhikari et al., 2004). The results of this study supports, at least partially, the general perception that ownership of more assets allows households to exploit more forest resources (Coulibaly-Lingani, Tigabu, Savadogo, Oden, & Ouadba, 2009), which possibly motivates stakeholders to participate more in forest conservation activities so that they can benefit from the forest in a sustainable manner. Wood (2007) also observed that the poor who are among the majority of the CFA members see the forest as the source of that additional land, although wage labor opportunities for immediate cash are probably more attractive to them. The very rich may have enough agricultural production to support them; hence they view forest maintenance as a way of diversifying their income-generating opportunities so as to reduce risks. The majority of the middle-income groups are likely to participate in forest management because they are highly aware of the fatal consequences of deforestation (Dolisca et al., 2006).

Although the nature of the “head of household” did not seem to influence a household’s decision to join CFA, it had a significant influence on participation in forest conservation for all respondents irrespective of CFA membership ($\chi^2 = 29.955$, $p < 0.001$), with a greater number of male-headed households (62.5%) participating compared to female-headed households and households of other natures (See Figure 3). This result suggests that CFA membership participation might improve with greater gender equality and equal decision-making between men and women.

This discrepancy in gender participation could be attributed to the differences in gender roles in the respective society, hence male headed households have a greater chance of participating than female-headed and single-headed households, as the sharing of domestic chores is often limited in these communities/households. Sell (1997) found that women co-operate more often in intact-female groups than where they are a minority in a mixed-gender group. However, men cooperate more smoothly in a largely female group since they are able to influence group decisions in such an

Table 1. Level of participation in relation to range of total farm size.

Level of participation	% of respondents /range of total farm size				N
	≥0.5 acres	0.6-2.0 acres	2.1-5.0 acres	5.1 acres and above	
High	7.8	60.9	20.3	10.9	64
Low	20.0	53.3%	26.7%	.0	15
No participation	.0	.0%	.0	100.0	1
Total	10.0	58.8	21.3	10.0	80

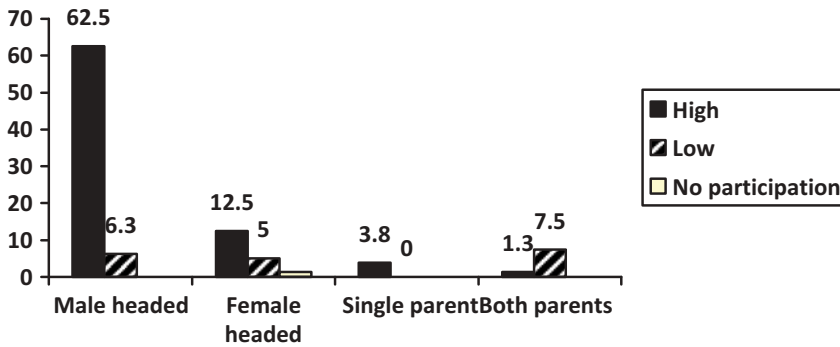


Figure 3. Level of participation in relation to household headship.

environment, as opposed to an all-male group where all other members are equally powerful. Therefore, the low social standing of female community members, and moreover: of single women, and the limited participation of such women in leadership positions, may limit the participation of women in forest conservation and in accessing subsequent economic benefits.

Alternative sources of livelihood

In this study, a highly significant relationship ($\chi^2 = 28.189$, $p = 0.001$) was observed between alternative sources of livelihood and the level of CFA members' participation in PFM. The majority of high level participants (62.3%) were those keeping livestock as an alternative source of livelihood. As well, the fodder source was also noted to have some significant influence on the level of CFA level of participation ($\chi^2 = 23.952$, $p = 0.002$). A majority of high level participants (43.3%) gathered fodder from the government forests, which reflects how the benefits gained from the forest motivate CFA members to participate to a greater degree. It was also observed that the level of CFA members' participation was also influenced by their source of firewood ($\chi^2 = 40.983$, $p < 0.001$). There was a significant difference between mean fuel-wood consumption for respondents with different sources of firewood ($F = 9.062$, $p < 0.001$). The mean fuel-wood consumption for respondents per respective sources were: government forest = 2.97 head loads, own farm = 1.81 head loads, neighbors = 1.50 head loads, and market = 1.10 head loads. Lise (2000) noted that forest dependency stimulated people's participation in forest management. Coulibaly-Lingani et al. (2011) attributed this phenomenon to the fact that people with a higher level of forest dependency have a higher stake in the forest, which is reflected in their level of participation in management.

Age and level of education of CFA members

The level of participation of the CFA members was not significantly influenced by participants' age range, level of education, or distance of their homestead from the forest. However, it was observed that most of the 64 CFA members with a high level of participation (40.6%) were in the range of 36 to 50 years in age. Considering the average

age of the high (45 years), low (48 years), and no participation (65 years), it was noted that there was no significant differences ($F=1.414$, $p=0.25$).

Most of the high level participants were of upper primary (35.9%), secondary school, (31.3%) and lower primary (20.3%) levels of education. Though the influence of education on level CFA participation in PFM seems to be insignificant in this study ($\chi^2 =10.829$, $p=0.2$), it is still clear and consistent with other studies that illiterate farmers are less likely to participate in forestry programs. Literate people are more aware of potential benefits obtained from well-managed forests than the illiterate. Respondents with primary education are more willing to participate than the illiterate (Dolisca, Carter, McDaniel, Shannon, & Jolly, 2006). Therefore, education plays an important role, though not statistically significant, in encouraging a high level of participation for the CFA members across the two study sites.

Well-being categories of CFA members

A high level of participation was indicated by a higher number of the CFA members in the rich/well-off category and the poor (see Figure 4).

The level of participation was not influenced by the current well-being of the CFA members ($\chi^2 =1.42$ $p=0.84$). However, the data clearly shows that the PFM process in the two forest sites had the support of the rich households more than the very poor households, similar to what was observed in Haiti and attributed to the fact that they were aware of the effects of deforestation (Dolisca et al., 2006). Adhikari et al. (2004) also noted that the poor households have a high opportunity cost of participation, as the time spent in participation could be used instead to gain additional cash income. The observations of this study also support the observation that poor households do not benefit as much as middle and upper income households; hence they are not very interested in community participation (Malla, Neupane, & Branney, 2003).

Key indicators for perceived level of benefits

The key indicators for “high-perceived” benefits were indicated by 76.3% of CFA members from both the Ngare Ndare and Ontukigo CFAs. These benefits include; firewood (75.4%),

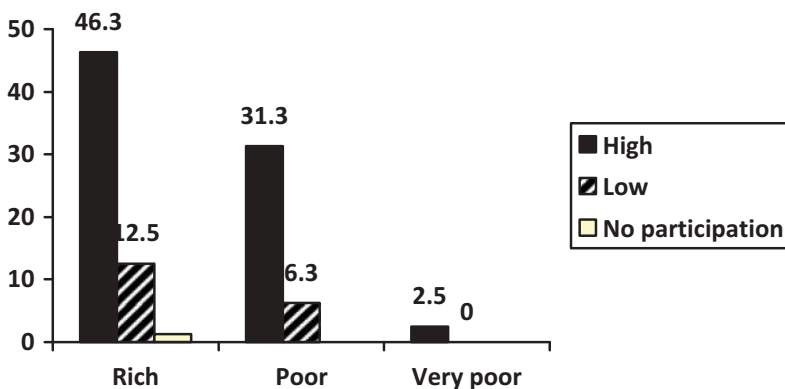


Figure 4. CFAs Level of participation in relation to well being categories.

grazing (55.4%), PELIS (32.8%), and potential IGAs. Key indicators for “low” and “no perception” were indicated/attributed to high fees charged for forest products (11.1%), lack of sharing of financial benefits (33.3%), low benefit return, and too much time taken to get the benefits (33.3%), as well as too much time spent in forest conservation work (22.2%). Factors leading to actual high participation were identified by 67 CFA members as: generally high benefits expected (67.2%), High PELIS benefits witnessed (46.3%), need to conserve forest (43.3%), PFM awareness (29.9%), and holding leadership positions (26.8%). Factors contributing to “low” and “no participation” were highlighted as “low” or “no” perceived benefits, lack of finance, and people being too busy to participate. The PFM paradigm that is currently in operation in the Ontulili and Ngare Ndare forests is most likely “benefit sharing”, since a high level of participation is associated with a high level of PFM benefits. Yemshaw (2007) describes this paradigm as characterized by having the adjacent forest community members more interested in accessing forest products.

Conclusion and recommendations

One of the objectives of this study was to assess whether there was a relationship between the level of participation of CFA members in PFM and their perceived benefits. It was noted that the level of participation of CFA members in PFM was positively influenced by the level of perceived benefits. A high level of perceived benefits encouraged a high level of CFA participation in PFM activities.

The range of total farm size also influenced participation level positively. A high level of participation was observed for CFA members with land ranging from 0.6 to 5 acres. Using the community wealth rank characteristic of farm size, none of the CFA members under the category of very poor (less than 0.5 acres) and of the very rich category (more than 5 acres) participated in PFM activities at a high level.

It was also noted that majority of the households participating at a high level were headed by males, hence the nature of the head-of-household influenced the level of CFA members' participation in PFM activities. The major forest benefits that encouraged high participation in PFM were identified as firewood gathering, grazing, and other income generating activities in both forests and PELIS in Ontulili forest. Other factors motivating CFA members to participate at a high level in PFM include: the need to conserve forests, PFM awareness, and being involved in CFA leadership.

Training in forest conservation and management was identified as a factor contributing to high level participation of CFA members in forest patrol (50.7%), fire control (71.6%), tree nursery activities (70.1%), and tree planting (44.8%). A majority of the CFA members who planted trees in their farms had a high level of participation in PFM and a high PFM benefit perception. Thus: the level of CFA participation and their perceived PFM benefits influenced tree planting on the farms positively.

A high level of participation of CFA members in forest patrol, fire control, tree nursery activities, and tree planting was associated with training and high PFM benefit perception. It is important for the government to provide adequate training on all forest conservation and management issues to all CFA members in order to increase their level of participation in all PFM activities. The government should also assist the CFAs involved in PFM to develop good business plans to enhance income generation from both on-forest and off-forest income generating activities in which they are engaged.

The contribution of PFM activities to better livelihood is assessed by the forest communities on the basis of the few benefits the CFAs have been receiving since they joined PFM and those benefits expected in the future. Therefore, the government should work closely with the CFAs to find ways to sustain income generation from PFM, as these benefits—whether financial or otherwise—act as incentives to community participation in PFM activities.

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