# Factors Determining Household Membership to Community Forest Association for Participation in Management of Upper Imenti Forest, Meru County, Kenya

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## Abstract

Participatory Forest Management in Kenya was commenced in 1997 with the main objective being the improvement of forest conditions and enhancement of livelihoods for forest adjacent communities. This study was conducted in Upper Imenti Forest where PFM is implemented by Meru Forest and Environmental Conservation and Protection Association (MEFECAP) which got registered in 2006 as a Community Forest Association (CFA). Identification of factors affecting household membership to the CFA was considered important in this study because it will provide the information required by policymakers to develop strategies for promoting sustainable community participation in forest management for increased forest cover and improved forest conditions for sustainable forest productivity. A total of 384 participants were selected randomly from villages surrounding nine beats of the forest and stratified into two groups namely PFM and Non-PFM participants. Quantitative data was collected through a household survey using a semi-structured questionnaire. Qualitative data was collected using interview schedules and focus group discussions among key informants selected through snowballing. Factors determining household membership to CFA were identified using chi-square values obtained through analysis of quantitative data using Statistical Package for the Social Sciences (SPSS) version 25. The CFA officials indicated a positive trend in CFA membership associated with the support provided by Upper Tana and Nature Kenya to start eco-tourism projects within the forest. Factors determining CFA membership were identified as: age (F = 13.035, p = 0.000); household size (F = 10.472, p = 0.001); total income (F = 43.564, p = 0.000) and total accessible land (F = 10.730, p = 0.001). PFM par-

ticipation in Upper Imenti Forest was noted to be gender indiscriminative and it was not influenced by the marital or education status of the household head. It was however noted that by the end of June 2020, MEFECAP had 1943 registered members from the 9 beats of Upper Imenti Forest with 62.5% (1215) being women. It was also found that for CFA members, gender was a significant determinant in choice of user group membership at a 5% significance level (t = 5.635, p = 0.02) with the firewood collection user group having the highest number of members (858) with 98.8% of them being women. For tree nursery, grazing, grass cutting, beekeeping and ballast, the majority of the members were male gender. Hindrances to CFA membership for non-members including inadequate information about PFM and CFA, poor CFA management, lack of a legal benefit sharing mechanism and lack of a conflict resolution mechanism among others need to be addressed. The study further recommends that the participation of youth is encouraged and that all efforts be made to increase income generation through participation in PFM for sustainable community involvement in PFM implementation through CFA membership.

## Subject Areas

Environmental Sciences

## Keywords

Participatory Forest Management, Community Forest Association, User Group, Participation, Membership, Livelihood, Conservation

## 1. Introduction

Forest management in Kenya in the past has been a state responsibility without the involvement of communities living adjacent to the forest, a practice linked to reduction in forest cover and poor forest conditions. This has necessitated the inclusion of the forest adjacent communities through the introduction of Participatory Forest Management as a form of devolution of forest management globally (Kagombe *et al.*, 2017) [1]. Community participation is recognized universally as an effective approach to the management of forest resources (IUCN, 1992) [2]. A wealth of research shows that participation continues to be relatively low in a number of the PFM schemes in developing countries (Lund *et al.*, 2018 [3]; Chomba *et al.*, 2015 [4]) despite the realization that the attainment of conservation initiatives essentially depends on the scope of participation of the local people and benefits gained from the adjacent forest as noted by Bremer and others (2014) [5]. In most developing countries especially in Africa, forest management policies have in the past not acknowledged the imperative role of communities living around the forest in the management of the existing forest resources (Mbeche *et al.*, 2021) [6].

In Kenya, the idea of Participatory Forest Management (PFM) was a result of

the government's recognition that local adjacent communities could help enhance the increase in tree cover and to reduce forest degradation (Kenya Forest Service, 2015) [7]. Community participation was therefore initiated through the passing of the Forest Act 2005 and Forest policy 2007 (Republic of Kenya, 2005 [8], 2007 [9]).

Participatory Forest Management (PFM) is defined as procedures and mechanisms that empower stakeholders who have a stake or are concerned about forest resources to be involved in decision-making in all forest management features (Schreckenberg, *et al.*, 2006) [10]. The Kenyan PFM National Guideline as developed by Kenya Forest Service (2007 [11], 2015 [7]) describes PFM as a method of managing forests purposefully incorporating communities neighboring the forests as well as other interested partners with a view of protection and management of forests and generation of incomes to enhance livelihood for the local community members involved. Participatory Forest Management in Kenya was first recognized under the Kenya Forest Act 2005 (Republic of Kenya, 2005) [8] whereby forest-neighboring community members were permitted under section 46 of the Act to form the Community Forest Association (CFA) under the Societies Act 1998 Chapter 108. The CFAs are mandated to develop Participatory Forest Management Plans (PFMP) and sign a Forest Management Agreement (FMA) with KFS through which the CFA members gain certain rights (Republic of Kenya, 2016) [12]. However, their participation in forest management does not imply that they own the forest (Republic of Kenya, 2005 [8], 2016 [12]). A registered CFA is qualified to apply to the Director of Kenya Forest Service for permission to participate in the conservation and management of a state forest or local authority forest in accordance with the provisions of this Act. The application should be in the prescribed form and should contain; a list of the members of the association and its address; the constitution of the association; the association's financial regulations; the area of forest for which the association proposes to undertake conservation and management and the association's proposals concerning; use of forest resources; methods of conserving of biodiversity; and methods of monitoring and protecting wildlife and plant populations and enforcing such protection (KFS, 2022) [13].

Policies on the incorporation of local communities in forest resource management in Kenya have not sufficiently recognized that forest adjacent communities are different in nature. Due to these variabilities, CFAs may be mishandled and ultimately flop. More so, communities that form forest associations may not be the same and could be unpredictable as concerns their socio-economic and other characteristics that determine their commitment to participation in forest management. This variance could be from one forest to another hence the need to consider each forest separately given that different community members could be having different reasons for CFA membership for PFM implementation (Agevi *et al.*, 2014) [14].

This study considered it necessary to identify factors determining household

membership to community forest associations with a focus on enhancing sustainable participation of community members in forest conservation. Therefore, one of this study's objectives was to identify factors determining household membership to Community Forest Association for participation in forest management in Upper Imenti Forest in Meru County, Kenya.

## 2. Methodology

### 2.1. Description of Study Site

The study was done in Upper Imenti Forest situated in Meru County in Eastern Conservancy in Kenya which is rich in biodiversity and has various resources. Upper Imenti Forest Reserve is part of Mount Kenya Forest Ecosystem that was gazetted vide Legal notice Number 104 of 1938 under the Forest Department (now Kenya Forest Service) for the purpose of forest and water conservation, utilization and development. The forest has been estimated to currently have a total area of 10,375.800 hectares (KFS, 2018).

The Forest Block has an estimate terrain elevation of 2500 meters above sea level and it is located on latitude 0°3'0" and longitude 37°31'59.98" (KFS, 2010) [15]. The forest has been divided into 9 beats namely: Thege, Meru Station, Nchoroiboro, Kibaranyaki, Kithirune, Nkunga, Kithoka, Kithima and Kambakia (KFS, 2019).

### 2.2. Research Design

This study adopted a cross-sectional survey research design which encompasses collection of information through interrogation or administration of a questionnaire to a selected group of people (Orodho, 2003) [16]. The study incorporated both qualitative and quantitative data collection methods to enhance triangulation of the data sources while also ensuring complementarity for cross validation (Creswell, 2014 [17]; Hesse-Biber, 2010 [18]).

### 2.3. Data Collection

Primary data for identification of factors determining household membership to CFA was obtained using semi-structured household survey questionnaire administered to PFM and Non-PFM households, and a checklist used to guide focus group discussions with key informants for different community members involved in PFM implementation in Upper Imenti Forest. Randomly selected heads or representatives of PFM households in each of the sampled forest beat were interviewed on factors motivating and demotivating them in participating in forest management through CFA membership.

### 2.4. Data Analysis

Quantitative data from semi-structured questionnaires was managed using MS Excel computer software that was imported into SPSS for analysis. Socio-economic characteristic such as age, sex, education qualification, marital status, land size

among others were analyzed through descriptive statics and presented as frequency tables. Pearson Chi-square was further used to identify socio-economic factors that had significant influence on household membership to CFA to participate in PFM. Hindrances to sustainable participation in PFM were also analyzed through descriptive statistics and all factors discussed using information obtained through in-depth analysis of qualitative data.

## 3. Results and Discussion

### 3.1. Meru Forest and Environmental Conservation and Protection Association (MEFECAP)

The Upper Imenti Forest adjacent community and the Kenya Forest Service started piloting PFM approach in 2001 initiating forest conservation measures to address destruction of this forest and this was after the initial formation of MEFECAP in 1998and it was registered in 2006 (KFS, 2010) [15].

The MEFECAP CFA was formed with its objectives as to: ensure that the Upper Imenti Forest is well protected through community patrol and communicating to KFS on forest security matters to reduce forest destruction; ensure the forest is well conserved through participation of CFA members in Afforestation programmes implemented in degraded parts of the forest that need rehabilitation and in establishment of forest plantations and protection of water catchment sites; enhancement of the forest status by implementing silvi-cultural practices such as tree pruning and road maintenance; improving the CFA members' livelihoods through implementing income generating project activities for instance ecotourism, bee keeping, grazing in the forest and fuelwood and to build the capacity of other forest adjacent community members on the value of forests (Ongugo *et al.*, 2008) [19]. The leadership of the CFA is organized such that the executive committee is at the top of the leadership pyramid and below is the management committee and user group leadership (Figure 1).
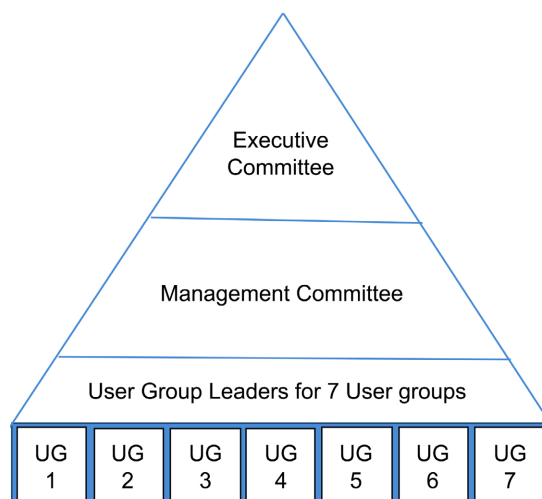


**Figure 1.** Structure of MEFECAP in Upper Imenti Forest (adapted from KFS, 2019).

Key for User Groups in Figure 1

**UG 1**—Fire Wood Collection User Group; **UG 2**—Tree Nursery User Group; **UG 3**—Grazing User Group; **UG 4**—Grass Cutting User Group; **UG 5**—Bee Keeping User Group; **UG 6**—Forest Protection User Group; and **UG 7**—Ballast User Group.

All the Forest User groups (UG in Figure 1) are registered under the Societies Act as Self-Help groups based on their interests in forest products.

**Election Process and Leadership Roles in MEFECAP CFA**

Election of leadership in the structure above starts at the beat level whereby members of the community in each beat register as member of the user rights groups based on their interests and this is done in the presence of their Chiefs and the Forester in-charge of managing the station. Under the supervision of the chief and the forester, the registered members elect their representatives in each beat and for each user right group. The elected user rights group representatives from all beats meet and elect the management committee in which apart from elected members additional coopted members include; forester, the chief, Women Representative and a representative of persons living with disability. The management committee then elects the executive committee and for one to qualify for membership of this committee they are required to have attained Kenya Certificate of Secondary School Education. The roles of these committees are discussed based on what has been stated in the manual on forming and registering Community Forest Associations (KFS and KFWG, 2009) [20] and additional information from the MEFECAP officials.

**CFA Executive Committee:** It is elected to manage and lead the association. It is charged with the responsibility of initiating registration of the CFA with the attorney general and thereafter ensures registration of the CFA with KFS so that it can participate in PFM.

**Forest Level Management Committee:** A committee initiated by the Kenya Forest Service to assist the CFA to comply with the memorandum of agreement (MOA) for implementation of PFM. This committee is very important because it ensures that the CFA has a governance structure in place. It is composed of KFS representatives, Community Forest Association representatives and other pertinent stakeholders who are to help the CFA in implementation of the community forest management agreement. In government forests that have been gazette by the government such as the Upper Imenti Forest, this committee is comprised of; Forester, KWS Warden, Forest Association Chairperson, and any other locally important stakeholders

This committee has various key functions including: provision of technical support for comprehensive management and operation of CFA; regulate effective service delivery by higher institutions such as Forest Conservation Committee; monitoring and evaluating functions of CFA; support conflict resolution among CFA members and offer assistance in development of work plans and guide the members on how to adhere to the work plans.

At the start of the study (May 2019) MEFECAP had about 1930 members some of whom were not fully registered but as at end of June 2020 the CFA had 1943 registered members from the 9 beats in Upper Imenti Forest both men and women.

**User Group Leaders:** In each forest beat, there are groups formed on interests in specific user rights. In Upper Imenti Forest, there are seven user groups (Figure 1). Each User in every beat has its leaders who govern how they access the desired forest products and these leaders assist the user group in paying the required fees to KFS as a group as well as communicating to the group members any updates from the CFA office and the KFS.

## 3.2. MEFECAP Membership and User Groups

The CFA officials indicated a positive trend in CFA membership which was associated with the support provided by Upper Tana and Nature Kenya to start eco-tourism project within the forest. Kibaranyaki had the highest number of members and Station beat had the lowest number of members (Table 1). The station beat is quite close to Meru town and this was found to be the reason for less membership since most members could be engaged in various businesses unlike in Kibaranyaki where it is more of rural life style and the demand for forest products especially firewood and grazing could be higher as informed by FGDs conducted among firewood user group representatives. This finding was supported by the Forest manager (Forester) during the interview schedule as well as the views of the CFA officials during the FGDs.

Table 1. MEFECAP membership per beat in Upper Imenti Forest.

| Forest Beat | Male gender | Female Gender | Total membership |
|---|---|---|---|
| Kibaranyaki | 222 | 238 | 460 |
| Kithirune | 162 | 223 | 385 |
| Kithima | 59 | 151 | 210 |
| Thege | 54 | 147 | 201 |
| Nchoroiboro | 39 | 157 | 196 |
| Kambakia | 18 | 146 | 164 |
| Kithoka | 88 | 74 | 162 |
| Nkunga | 61 | 39 | 100 |
| Station B | 25 | 40 | 65 |
| **Total** | **728** | **1215** | **1943** |

**Source:** Upper Imenti Forest Participatory Forest Management Plan (June 2020).

It was noted that majority of the MEFECAP members in all forest beats were women (62.5%) which is associated with the fact that majority of the people living in the rural areas irrespective of whether they are adjacent to the forest or not are of female gender who due to their roles in the family requiring fuel wood as their main source of energy. More so, the Kenya Constitution 2010 [21] requirement to implement two-third gender rule in Kenya could have encouraged mobilization of more women to join CFA.

Further in a study on PFM implementation in Nairobi County, Kosgey (2015) [22] noted that majority of Ngong Road CFA members were women. In analyzing recognition and affirmation of women's rights in the management of CFAs in Nyeri County, Maina (2018) [23] similarly noted that majority of CFA members (69%) were women and that 97% of the women were motivated to participate in forest management by the forest economic benefits expected.

It was observed that there was a significant difference in number of men (F = 2.201, p = 0.04) and total membership (F = 4.307, p = 0.000) per beat which could be due to unemployment disparities within the beats whereby beats with a greater number of men that are not engaged in business or formal employment had relatively more male CFA members (Table 2).

A comparative analysis of mean number of female and male members for the 9 beats revealed that there was a significant difference between mean number of women and men (Table 3) who had joined all the user groups in the different beats at 5% significance level (t = 5.635, p = 0.02). There were generally a greater number of women joining the CFA across all the beats in comparison to the men.

Table 2. Analysis of variance on forest beat and number of male and female members.

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| Male Gender * Forest Beat | Between Groups (Combined) | 3500.105 | 8 | 437.513 | 2.201 | 0.041 |
| | Within Groups | 10934.895 | 55 | 198.816 | | |
| | Total | 14435.000 | 63 | | | |
| Female Gender * Forest Beat | Between Groups (Combined) | 3766.974 | 8 | 470.872 | 1.101 | 0.377 |
| | Within Groups | 23514.010 | 55 | 427.527 | | |
| | Total | 27280.984 | 63 | | | |
| Total Membership * Forest Beat | Between Groups (Combined) | 10766.048 | 8 | 1345.756 | 4.307 | 0.000 |
| | Within Groups | 17184.687 | 55 | 312.449 | | |
| | Total | 27950.734 | 63 | | | |

Table 3. Paired samples statistics for gender in Upper Imenti Forest beats.

| Variables | | Mean | N | Std. Deviation | Std. Error Mean | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|
| Gender | Female Gender | 135.00 | 9 | 71.86793 | 23.95 | 8 | 0.02 |
| | Male Gender | 80.89 | 9 | 67.98243 | 22.66 | | |

The results above imply that more women were available and willing to participate in PFM in all the beats compared to men which could be associated with the increased need for forest products among women to enable them meet the basic needs of their families. There were seven user groups with the majority of members being in firewood user group despite the fact that forest access for firewood was not permitted as per the Moratorium enforcement (Ministry of Environment and Forestry, 2018) [24]. Majority of the CFA members had interest in firewood collection user group (44.2%) while very few were members of the other user groups (Tree nursery-17.1%, grazing-11.5%, grass cutting-11.4%, bee keeping-8.8%, forest protection-6.0% and Ballast-1%) based on (Table 4). This was similarly observed by Maina (2018) [23] that majority of CFA members in Nyeri County were interested in fuelwood (51.7%) with the minority being interested in grazing (27.6%), bee keeping-10.3% and tree nurseries (10.3%).

Out of all the 858 members of firewood collection user group, women were the majority (98.8%) with the user group having only 10 men. For grass cutting, grazing and bee keeping, majority of the members were men (Table 5). This

Table 4. MEFECAP membership based on user groups' interest.

| User Group Interest | Male Gender | Female Gender | Total number/% |
|---|---|---|---|
| Firewood Collection | 10 | 848 | 858(44.2%) |
| Tree Nursery | 195 | 138 | 333 (17.1%) |
| Grazing | 156 | 67 | 223 (11.5%) |
| Grass Cutting | 159 | 62 | 221(11.4%) |
| Bee Keeping | 136 | 35 | 171(8.8%) |
| Forest Protection | 58 | 59 | 117(6.0%) |
| Ballast | 14 | 6 | 20 (1.0%) |
| Total | 728 | 1215 | 1943(100%) |

**Source:** Data analysis output by Author (2020).

Table 5. ANOVA for CFA male and female membership and user group interests.

| | | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|---|
| Male Gender * User Group Interest | Between Groups | (Combined) | 7022.356 | 6 | 1170.393 | 9.000 | 0.000 |
| | Within Groups | | 7412.644 | 57 | 130.046 | | |
| | Total | | 14435.000 | 63 | | | |
| Female Gender * User Group Interest | Between Groups | (Combined) | 7592.958 | 6 | 1265.493 | 3.664 | 0.004 |
| | Within Groups | | 19688.027 | 57 | 345.404 | | |
| | Total | | 27280.984 | 63 | | | |

**Source:** Data analysis output by Author (2020).

could be linked to women being the majority of the user group members and that their major interest in joining the CFA was to access firewood. More so, FAO estimates that over 2 billion people living in rural and urban areas use fuelwood for cooking and heating and that wood-based energy contributes to the basic energy source in Africa (27%), Caribbean and Latin America (13%) and 5% in Oceania and Asia (UN, 2017) [25].

Further analysis revealed that there was a significant difference between gender and user group interests where both male and female had significant relationship with use groups that is: male (F = 9.000, p = 0.000) and female gender membership (F = 3.664, p = 0.004) based on user groups' interests (Table 5). This implies that gender was a determinant in community members' decision on which user group to join depending on their interests. For instance, firewood user group had more women than men compared to all other user groups most of which had lesser women. This could be due to the fact it is a common gender perspective that women have the responsibility to provide for the family through crop production and collection fuel wood as their main source of energy for cooking, fetching water and collection of other basic forest products (Wan *et al.*, 2011) [26]. It has also been noted that women spend much of their time looking for firewood as a basic need for the livelihood of their families hence their high interest in joining CFAs to access this forest benefit (Köhlin *et al.*, 2011) [27].

On the contrary, grazing, grass cutting and bee keeping were noted to have more men than women because these activities have been considered for a long time to be gender sensitive hence traditionally undertaken by men (FAO & CARE, 2019) [28].

### 3.3. Social Economic Characteristics of Upper Imenti Forest Study Respondents

The characteristics of both CFA and Non-CFA members interviewed during this study were analyzed and significant factors determining household decision to join PFM participation identified. Education level was significant factor in influencing community member's household decision to join CFA (Table 6) and participate in PFM through CFA membership at significant level of 0.05 (Pearson $\chi^2$ = 7.374, p = 0.06).

Table 6. PFM participation and education level cross tabulation.

| PFM participation status | No formal education | Primary Educ. | Secondary Educ. | Tertiary/ University | Total |
|---|---|---|---|---|---|
| Non-CFA | 12 (7%) | 75 (39%) | 63 (33%) | 42 (22%) | 192 (100%) |
| CFA Member | 20 (10%) | 92 (48%) | 51 (27%) | 29 (15%) | 192 (100%) |
| Total (N) | 32 | 167 | 114 | 71 | 384 |

**Source:** Author's field data (2020).

Although more males were interviewed than females, gender of the household head was not a significant factor determining decision of community members in joining CFA (Table 7) to participate in PFM (Pearson = 1.294, p = 0.22). Hence participation in PFM in Upper Imenti Forest was not gender discriminative.

Marital status of the household head was not a significant factor in determining community members' decision (Table 8) to participate in PFM (Pearson = 2.340, p = 0.50).

On average, the CFA members were significantly further away from the forest (2.1 Km) compared to Non-CFA (1.5 Km) implying that community members far away from the forest felt the need to access the forest than those near the forest hence joining PFM implementation (F = 8.428, p = 0.004). Based on what is considered normal for the community members adjacent to the forest to be the major stakeholders accessing the forest hence more interested in PFM, further discussion with non-CFA members living adjacent to the forest revealed that most of those quite adjacent to the forest had quitted PFM involvement due to various challenges. This made, distance to become a significant factor influencing community members' decision to participate in PFM. There is need to address factors that are discouraging community members living more adjacent to the forest from participating in PFM as expressed by households that were previously CFA members but withdrew membership.

The community members who had joined CFA were on average significantly older (46 years) than non CFA members., with larger household size (3.9), with higher average total income (Ksh.367,315) and slightly higher average total accessible land in comparison to their fellow members who had not joined (Table 9).

**Table 7.** PFM Participation and gender.

| PFM participation | Household head_Gender | | Total |
|---|---|---|---|
| | Male (1) | Female (2) | |
| Non-CFA | 117 (61%) | 75 (39%) | 192 (100%) |
| CFA Member | 106 (55%) | 86 (45%) | 192 (100%) |
| Total (N) | 223 | 161 | 384 |

**Source:** Author's field data (2019).

**Table 8.** PFM participation and household head marital status.

| PFM participation | Single | Married | Divorced | Widowed | Total |
|---|---|---|---|---|---|
| Non-CFA | 32 (17%) | 125 (65%) | 14 (7%) | 21 (11%) | 192 (100%) |
| CFA member | 22 (11%) | 131 (68%) | 14 (7%) | 25 (13%) | 192 (100%) |
| Total | 54 | 256 | 28 | 46 | 384 |

**Source:** Author's field data (2020).

Table 9. PFM participation status and socio-economic characteristics.

| PFM Participation | | Age | Household size | Total income | Total accessible land |
|---|---|---|---|---|---|
| Non-CFA | Mean | 41.00 | 4 | 89711.43 | 0.92 |
| | N | 183 | 154 | 70 | 152 |
| | Std. Deviation | 14.136 | 2 | 93279.773 | 0.71 |
| CFA Member | Mean | 46.13 | 5 | 367315.15 | 1.29 |
| | N | 181 | 130 | 103 | 169 |
| | Std. Deviation | 12.923 | 1.773 | 343088.277 | 1.09 |
| ANOVA (CFA & Non-CFA) | F-Value | 13.035 | 10.472 | 43.564 | 10.730 |
| | Sig. (p-value) | 0.000 | 0.001 | 0.000 | 0.001 |

Source: Author's field data analysis (June 2020).

PFM implementation should focus on encouraging young people to join and participate actively in forest conservation. It was indicated during the FGDs with both CFA and Non-CFA members that higher number of youth participation could be attainable if PFM could create jobs for the youths or assist them get ways of revenue generation. Considering the household size, the larger the household size, the higher the requirement for more of the forest products for domestic and other uses.

Various studies indicate that the socioeconomic status of individuals may limit the prospects of participation in forestry programs while also influencing the extent of transaction costs (Ogada, 2012 [29]; Garekae *et al.*, 2017 [30]) whereby high transaction and opportunity costs of participation regularly result to low participation for the poor and marginalized community members (Mbeche *et al.*, 2021) [6].

While studying level of PFM participation by forest users in Ethiopia, Tadesse and others (2017) [31] similarly noted that identified family size and income from the forest to have impacted participation positively. On the contrary to this study, they also identified income from the forest and education level to be significant while in this study, participation in PFM was not gender discriminative neither was is influenced by education level. More so, their findings indicated long distance from the forest as a negative factor while in this study it was a positive factor. The results indicate that socio-economic and biophysical factors drive the community involvement in PFM. While assessing drivers of community participation in Participatory Forest Management in Kessup Forest, Elgeyo-Marakwet County, in Kenya, Rotich (2018) [32] noted that age, distance, gender, education level, awareness of the forest act, products derived from the forest, ownership of livestock and fodder sources as the major factors all significant at (p < 0.05). It was further deduced that involvement of the community

members in PFM was mostly determined by physicalsubstantial gains irrespective of the type of forest.

## 3.4. Hindrances to Sustainable Community Participation in PFM in Upper Imenti Forest

About 48.9% (94) of Non-CFA members living adjacent to this forest indicated various reasons for failing to participate in PFM through CFA membership or why some quitted membership in the past (Table 10).

Past studies have also identified issues related to CFA official's corruption, conflict of interest and lack of proper management of CFAs. For instance, Amirani and Zeeman (2013) [33] reported concerns about lack of transparency among CFA officials manifested through lack of accountability, embezzlement of CFA funds and extension of office term beyond what is stated in the CFA constitution.

Sustaining CFA membership and encouraging more community members to join PFM, will demand addressing the issues outlined some of which require government support. Awareness creation about PFM implementation and CFA is indicated as one of the most important factors that has caused many of the community members not to join hence the CFA officials need to take it up. Some of the hindrances such as lack of community involvement in decision making and the moratorium require government intervention. Mutune *et al.* (2017) [34] similarly noted that PFM was not granting actual decision-making powers to the registered Community Forest Associations (CFAs) over essential forest resources for instance timber and firewood. In Karima Forest, Thygesen *et al.* (2016) [35] observed that the established Community Forest Association (CFA) had not been entrusted with significant powers and that all powers and benefits were, maintained by the local authority.

Table 10. Factors discouraging CFA membership in Upper Imenti Forest.

| Factors discouraging CFA membership | Count | % |
|---|---|---|
| Inadequate information about CFA and PFM | 20 | 21.3 |
| Lack of proper CFA management | 15 | 16.0 |
| High time and resource demands | 14 | 14.9 |
| Hard CFA membership registration process | 13 | 13.8 |
| Limited benefits for CFA members | 11 | 11.7 |
| Moratorium & lack of community involvement | 11 | 11.7 |
| Conflicts (CFA leaders & members, CFA & KFS & KWS) | 8 | 8.5 |
| Lack of job creation | 2 | 2.1 |
| Wild animals | 1 | 1.1 |
| **Total** | **94** | **100** |

**Source:** Author's field data (2020).

The government will also require addressing the factors affecting the quantity of benefits that the CFA members can obtain through their participation. During the FGDs with both CFA and non-CFA members, it was communicated that some of the CFA members had quitted membership due to the moratorium which had denied them access to the forest for firewood. Consultations with the community before implementing such policies will be required to enable them understand the reasons for such measures hence encouraging continued participation in PFM.

Management of conflicts among the CFA, KFS and KWS needs to be addressed appropriately through the development of a conflict resolution mechanism. This was similarly recommended by Gebara (2013) [36] in PFM and REDD+ project in Brazil that the success of the project required the provision of an accessible and clear mechanism of resolving grievances.

## 4. Conclusion

This study identified factors determining membership of MEFECAP as age, household size, total income and total accessible land. Considering the age, most of the members were significantly older compared to the non-embers, hence the need to encourage the participation of the youth by increasing job opportunities through participation and diversification of the sources of income. It was concluded that participation in PFM implementation through CFA membership in Upper Imenti Forest was gender indiscriminative, an aspect that should continue being promoted. From this study and considering other studies discussed, there is an implication that factors influencing community decision to participate or not participate in PFM through joining CFAs may be more site-specific and should therefore not be generalized. However, there is a general observation that income generation through PFM-related activities is a great motivation for community participation in forest management.

## 5. Recommendations

This study recommends that the government of Kenya and other stakeholders involved in PFM implementation should help the community members involved to diversify income sources through encouraging eco-friendly income generating activities within and outside the forest. Forest-dependent activities that result in forest degradation should be discouraged through upscaling farm forest establishment. More so, the support of the government is required in addressing hindrances to CFA membership as highlighted by the Non-PFM community members in order to ensure sustained community involvement in the implementation of PFM in Upper Imenti Forest. This might require training CFA officials to ensure appropriate governance of the institution and to encourage good stewardship over the forest resources and the CFA human power while ensuring a good conflict resolution approach is developed for use when required. A practical benefit-sharing mechanism has to be put in place to encourage CFA mem-

bership and active and sustainable participation of forest adjacent community members in PFM.

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## Authors' Contributions

MJK conceptualized the research idea, developed the proposal, and undertook data collection and paper writing. MF and MJ reviewed all the work, and edited and approved the study as supervisors at Kenyatta University. All authors read, edited, and contributed to the manuscript.

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## Conflicts of Interest

The authors declare no conflicts of interest.

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## Acronyms and Abbreviations

| | |
|---|---|
| CFA | Community Forest Association |
| FAO | Food and Agriculture Organization |
| FMA | Forest Management Agreement |
| IGAs | Income Generating Activities |
| IUCN | International Union for Conservation of Nature |
| KES | Kenya Shillings |
| KFS | Kenya Forest Service |
| KFWG | Kenya Forest Working Group |
| KWS | Kenya Wildlife Service |
| MEFECAP | Meru Forest and Environmental Conservation and Protection Association |
| MENR | Ministry of Environment and Natural Resources |
| NGO | Non-Governmental Organization |
| PFM | Participatory Forest Management |
| PFMP | Participatory Forest Management Plan |
| RoK | Republic of Kenya |
| UG | User Group |