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Participation of People in Participatory Forest Management in Jawi District, North West, Ethiopia

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Abstract
The study intended to coduct on determinant factors for participation in participatory forest management in Shimelegir Forest, Jawi district, Awi Administration Zone, Ethiopia from October, 2012 to February, 2014. By using stratified random sampling method, 151 households were selected to carry out a questionnaire survey with the aim to generate data on the socio-economic and physical conditions. Binary logistic regressions, STATA version 16, were used to analyze willingness of participation. From explanatory variables, land holding size (7%), livestock owned by respondents (1.7%), poverty (53%), understanding about the CBO (40%), education (27%) and gender (30%) were found to have a significant effect on participation and significant power to influence household decision on participation. Distance from market and distance from forest, HH size and age found to have insignificant effect on the decision of participation. Hence, different stackhoolder should conceder those factors specially; the researcher was come upwith as insignificant effect on peoples to decide participating in participatory forest management user group.
Keywords: Participatory Forest Management, socioeconomic and biophysical factors and Shimelegir state forest

INTRODUCTION

Deforestation is the primary couse of degrading the forest resource. One of the options for reducing natural forest degradation is the introduction of Participatory Forest Management (PFM); whereby all stakeholders including forest dependent communities will participate in all forest management aspects. In recent years the focus on forest management and conservation has significantly shifted from the highly technical commercial forestry to a more people-oriented social forestry orientation or PFM (Hobley, 1996).

PFM is being scaled up in Ethiopia by MoA as a Scaling–up of Participatory Forest Management project (SPFM) with the help of European Union since 2009. The Participatory Forest Management (PFM) programme has been operational since 2012 in the forest of Shimelegir. As the programme is new no one can be sure of the outcome. It may be successful or facing a failure. This study, therefore, contributes in identifying the factors contributing to the success or failure of such projects, which employ participatory community forest management strategy. More specifically, it casts light on the complex relationships between the identified factors and participation in community forest management in the case of Shimelegir state forest Awi Zone, Amhara Region.

At leterituer review part different related reviewers are cited to expline the already findings and solutions that were answerd their stated objectives. How the research could be worked out has explained in the methodology part. The result of this study discribs informations that achieved the stated objectives with descriptions which have related and contrasted previous findings with in Ethiopian and nearby dryland countries. Lastly conclusion and recomenditions are defind for the intended to do objectives.

Statement of the Problem

The uncontrolled exploitation of forest areas by anthropogenic factor and depletion of vegetation by natural factor led to the threat as well as the decline in number and area of many plant species (Tesfaye Bekele, 2002). The combined information of population structure and demographic data can explain the potentials and/or constraints of the future population dynamics of a site (Peters 1996).

In Jawi district the forest contributes different non-timber forest products for people's livelihood but the resource has not utilized sustainably. So far, no study has been conducted to investigate as to why people's participation in PFM is less in the study area.

Therefore, this study tries to fulfill this gap by determining level of participation. This forest resource have not properly and sustainablly managed and utilized. No study was made on means of sustainable forest management that is Participatory Forest Management in Ethiopia.

Objectives of the Study

General objective

The general objective of the study is to assess factors affecting participation in Participatory Forest Management in Shimelegir state forest, Jawi district, Northwest Ethiopia

Specific objectives
The specific objectives are:
To assess the socio economic factors for householdes to partcipate in Participatory Forest Management.
To assess the Biophysical factors for householdes to partcipate in Participatory Forest Management.
Research question
The questions to be answered by this study are the following:
What are the factors affecting peoples to participate or not to participate in Participatory Forest Management?
Are there socio-economic and bio-physical factors affecting communities to participate in Participatory Forest Management?

MATERIAL AND METHODS

Description of study area
Location
Awi is one of the 11 zones found in Amhara National Regional State (ANRS). It consists of seven werdas and two towns administration namely Guangua, Ankesha, Banda, Dangila, Fageta Lekoma, Guagussa Shikudade, Jawi and Chagnie and Injibara town. The study was conducted at Jawi Wereda, which was newly delineated by taking peripheral lands of Quara, Alaffa Takusa and Dangila Weredas. The study area is located in the Northwestern peripheral lowland of Ethiopia, bordering the Benishangul-Gumuz National Regional State. The area lies aside to Metekel resettlement area of the Derg regime, west of Belles River and extending up to the northern foots of the Belaya escarpment. It lies within the geographical location of 360 to 370 East and 10038` to 110 30` North. It has an area of 515,000 hectares. The study forest area covers about 524.89ha.
Climate
Jawi has a climate which can be described as tropical with winter dry season. The agro-ecological map of the region reveals that Jawi has a warm and humid lowland zone around the area of the Belles River, a major tributary of the Blue Nile, and further to the west and the rest of the region lies in a hot and humid zone." The study area as a whole is in a Kola Zone (hot). The temperature in the region is hot most of the year with an average ranging between 30-350C (Jawi Meteorological station, 2007). During the Bega season (October-January), the temperature ranges between30-350C; during the Belg season (February-May) it ranges between 35-400C and it begins to cool down during the Keremt season with temperatures ranges between 25-300C. Jawi receives very little rainfall; for example, during the rainy season (Keremt), it receives only between 400-800 mm of rainfall.
Vegetation
Based on the physiognomic division of the nine vegetation types of Ethiopia, the vegetation of the area falls on Combretum - Terminalia broadleaved deciduous woodland. This vegetation characterized by Combretum spp, Terminalia spp, Lannea spp, Oxytenanthera abyssinica, Boswellia papyrifera, Streospermem kunthianum, Albezia malacophylla and Entada africana (IBC, 2007). In addition to the woodland, deep incised valleys of the area have reverine vegetation while poorly drained depression tends to have grassland vegetation (MoA, 2000). Vegetation of Combretum - Terminalia woodland ecosystem has developed under the influence of fire. Thus, trees have very thick bark to cope with fire while most herbs have perennial bulbs (Menassie Gashaw, 2000).This vegetation has been deforested in recent years due to indiscriminate fire, intensification of agriculture, and extraction of wood for fuel wood and construction material. Since 1984 there has been an intensification of agricultural activity together with increasing population due to the government schemes that settled people from famine stricken areas of highlands (Anonymous, 1994).
Populations
The study area is situated in between four Wereda (Dangila, Achefer, Alafa Takusa, and Quara) of Amhara Region and Metekel Zone of Benishangul-Gumuz National Regional State. The total population of the Wereda is estimated to be 71,357 with average household size of 5.6. Jawi has a population density of 12.174 persons / k m2 (CSA, 2007).
Farming / Cultivation system
One of the major reasons why Bellesí Valley is sparsely populated has to do with the fact that the region is infested with malaria, bilharzias, meningitis, and tsetse fly. The indigenous people who inhabit the Wereda are the Agew, Amhara, and the Gumuz. Originally, the system farming by the Gumuz and Agew people of Jawi area was shifting cultivation using simple hand tools like hoes by fallowing their land for some time to regenerate its fertility. In addition to this Agew people mostly depend on beekeeping and rearing small ruminates (Wolde Selassie Abbute, 1997). In the beginning of 2000 Al-Mesh PLC, worked on agricultural investments and occupied the area around Fendika town they introduced mechanized farming technologies which included new way of cultivation using agricultural inputs, tractors and monoculture farming system, that caused the clearing of large-scale woodland forest. After 2002, the first round government supported resettlers arrived in the area; spontaneous resettlers also simultaneously occupied large area and practiced their cereal-based agriculture

mainly oilseeds, maize, sorghum and others. For the time being 75000 ha of the study area near to Fendika town is occupied by sugar project and it provide employment opportunity for more than 20,000 peoples.

Data Collection

Data for the study were collected from primary and secondary sources. The primary data were collected employing systematic stratified sampling method and bio-physical inventory and socio-economic assessment respectively. Secondary sources mainly from published and unpublished works such as annual report of Agricultural Development Office of Jawi and annual plane of Environmental Protection, Land Administration and Utilization Office Jawi woreda

Socio-economic data collection

As this research explains the relationship between participation and the different explanatory variables, it is explanatory type of study. Primary data sources were used to collect the data. Semi structured household questionnaire, were used to collect data about social, economic and biophysical characteristics of the sampled village households.

From total population of kebele the sample household was selected randomly based on (Cochran 1977) sampling formula for the purpose of data collection through household questionnaire.

$$no = \frac{z^2pq}{d^2} \rightarrow n = \frac{no}{1+\frac{no-1}{N}}$$ .....Equation 3.1

Where: no = the desired sample size
n = number of sample size
z = 95% confident limit i.e. 1.96
p = proportion population to be included in the sample i.e. 10%
q = 0.9
N = total number of population
d = margin of error (5%)

Primary data were generated by the use of structured questionnaires and interview schedule administered on the respondents. The questionnaires were pre-tested using randomly selected farmers from the sampled households to evaluate whether they were prepared in the way that creat communication between interviewers and interviewed. The necessary adjustments to the questionnaires were then made before fully duplicating and distributing them to the enumerators.

The household questionnaire was designed with the following objectives in mind. The first objective is to have a general understanding about household characteristics. Data related to distance from forest, distance from market, household size and some demographic variables like age and sex were collected. The second objective was to reveal understanding of respondents about Participator Forest Mnagement. Specifically, knowledge of the respondents about the major activities in formation of Community Based Organizations was evaluated. The third objective was to collect data about the major household activities and their contributions to thier income. Respondents' income from forest was used to estimate the economic value of forest resource to rural livelihoods. Regular monitoring was conducted by the researcher while enumerators are interviewing the respondents and daily evaluation of the filled questionnaires was undertaken throughout the data collection processes.

Description of Variables and Respective Hypothesis

Dependent variable = Participation

Participation is the dependent variable of this study. Participation is operationalized as the involvement of a community in PFM. It refers to being a member of a Community Based Organization (CBO). Accordingly, the variable is coded as follows

• Household was coded 0 if they were not member of the community forest group
• Household was coded 1 if they were member of the community forest group

Independent variables

The independent variables were classified into economic, social and biophysical variables. The description of variables used in this study is presented below with their respective hypotheses.

Wealth status

To run the regression, after annual income of the respondents was computed in birr (Ethiopian currency) it was exchanged to wealth status, poor and rich. This value was taken as it is to perform the regression analysis. The richest segments of the community have more time to participate in community meetings and more information about PFM. Thus, one hypothesis tested was people with lesser income are less likely to participate in PFM.

Livelihood options in the forest / economic value of forest

As a rational being, community has reason to preserve forest. The economic value of forest highly determines household decision to involve in community forestry programme. The economic value of forest was measured as a proportion of forest income from total income. The main forest related a household activity was firewood sale. Based on this fact forest income was expected to have a positive impact on household decision to participate.

Gender

In most rural African communities, people work hard for long hours to sustain their lives. Though the type of work may differ from country to country, women do more work than men. Generally, rural women work longer hours than men and are involved in a wider range of activities. In rural areas women work 'double' days as they manage both production and maintenance. But adult men in the village have few tasks to do and therefore are freer than women. This gender imbalance in labour mainly reflects women are less participation in such programs (CBO)

Livestock owned

Households' livestock resource was measured by tropical livestock unit (TLU). Households with more livestock unit are more inclined to use community forests for fodder and grass. Thus, they are more inclined to participate in community forest management and it was expected that income from livestock have a significant positive relationship with participation.

Understanding of the community

Perception of the community was measured by the level of understanding the community has about the major activities in formation of Community Based Organization. To measure respondents understanding about Community Based Organization, the researcher marked ten important questions from the household questionnaire and corrected them out of ten. This variable was changed into categorical variable; some understanding (if they scored greater than five) and no understanding (if they scored five and less than five). Then a dummy variable was created and coded as zero if the respondents have no understanding and 1 if they have some understanding to run the logistic regression. Thus, one hypothesis tested was whether such variable has actual effect on the up take of community based forest management project.

Household size

Large families can improve forest condition by increasing aggregate household contributions to conservation and support to institutions that facilitate conservation. Thus, a significant positive relationship was expected between participation and household size.

Distance from forest

Distance from forest was measured by the time spent to reach the forest. PFM involves both protection and utilization of forest resource. For those who are far away from the forest, it may be difficult to equally participate with those who are inside the forest in forest protection; hence, respondents who travel for three hours to reach the forest may decide not to participate. Thus, it was expected that respondents close to the forest would be more interested to participate in PFM.

Distance from market

Distance from market was measured by the walking time from the nearby markets. Respondents who are very close to the market are expected to join PFM at the earliest. This is because they can easily sell the forest products and support their livelihood.

Age

Age in this study refers to the age of respondent at the time of interview. People feel responsibility as their age increase. Thus, a positive relationship between participation and age was expected.

Data Analysis

Socio-economic data analysis

Data processing is an important part of the whole survey operation. It includes manual editing, coding, data entry, data cleaning and consistency checking. The researcher made all these activities of data processing. Econometric analysis was performed to study the effect of explanatory variables on participation. STATA version 9 was used for the analysis.

To explain the observed variation in participation, binary logistic model in which the dependent variable participation is regressed as a function of the explanatory variables, economic, social, and biophysical was used. The response of the participants as to whether they participate in PFM can be outlined as a binary-choice model, with an outcome (decision of households) of participation or no participation. The decision of households whether or not to participate in PFM depends on economic, social and biophysical factors. Simply put, in the biary logistic model, Yi represents the dependent variable, participation, which equals to 1 if the respondent participates in PFM and 0 if not. The probability of household participation in PFM, Pr (Yi = 1), is a joint probability density function/ likelihood function evaluated at $X_i\beta$, where Xi is a host of explanatory variable and β is coefficient of the predictor variable explaining the change in the dependent variable as a result of a unit change in an explanatory variable. In the biary logestic model, like in any nonlinear regression model, the parameters are not necessarily the marginal effects (Greene 2000; Kennedy 2001), but represent changes in the natural log of odds ratio for a unit change in the explanatory variables. The estimation form of biary logistic transformation of the probability of participants' opinions in favor of participation in PFM Pr (Yi= 1) can be represented as:

$$\Pr(Yi = 1) = \frac{\exp(XiB)}{1 + \exp(XiB)}$$ ……..……Equation3.3

The above equation can be reduced to:
Pr (Yi=1) = B0+B1X1+B2 X 2+ ... +BiXi
Where: P is the probability of presence of the characteristic of interest, participation.
B is the coefficient of the predictor variables and is estimated from calibration data using maximum likelihood technique.
X is a host of explanatory variables
The dependent variable: The outcome variable is participation of households in PFM, which is coded 1 to signify participation in PFM if explanatory variables are affecting the respondents to particpat as increase per the variables unit and zero if not.
Independent variables: refers to a host of explanatory variables assumed to influence respondent's decision to participate in PFM.
The model, which represents participation (coded 1 if the household has participated and 0 if not) and a host of explanatory variables, is given by:
P(P) = B0+B1(Poverty)+B2(IF)+B3(IFW)+B4(PU)+B5(HHS)+B6(DF)+B7(DM) +B8 (A) +B9 (LA) +B10 (LS) + B11 (E)
Where:

P	is a binary dependent variable indicating participation in PFM
Bo	Constant (y- Intersept)
Poverty	is a continuous variable indicating annual gross income of respondents
IF	is a continuous variable indicating proportion of forest income from total income
Gender	is a continuous variable indicating sex of respondent
PU	is a dummy variable indicating respondents understanding about the major activities in the different stages of community based organization
HHS	is a continuous variable indicating the household size
DF	is a continuous variable indicating the time to reach the forest in minutes
DM	is a continuous variable indicating the time to reach the nearest market in minutes
A	is a continuous variable indicating the age of the respondents at the time of interview
LA	total land area owned by a household (heacter)
LS	total livestock units owned by a household
E	Educational level of the respondent (1 = illiterate)

Determinants of Participation in Participatory Forest Management
In order to answer the research question, what are the factor affecting peoples to participate or not participate in Participatory Forest Management; researchers chose to use the logistic regression model.
Table 4-3 Logistic estimation reporting marginal effects
Note1: *1% significance level, **5% significance level, ***10% significance level

Var	Coef.	S.E.	Z	P> | z |	[95% conf.	Interval]	dy/dx
Age	-.0238153	.0382397	-0.62	0.533	-.0987636	.0511331	-.0056517
HHs	-.0425015	.2394371	-0.18	0.859	-.5117896	.4267866	-.0100862
E**	1.188132	.586224	2.03	0.043	.0391545	2.33711	.2725418
DFF	-.0071138	.0229806	-0.31	0.757	-.052155	.0379274	-.0016882
DFM	-.1638265	.4601075	-0.36	0.722	-1.065621	.7379676	-.0388781
PU**	1.718734	.6689943	2.57	0.010	.4075294	3.029939	.4048069
LA**	.2990887	.1299024	2.30	0.021	-.0444847	.5536928	.0709776
IF	-.0001034	.0001022	-1.01	0.311	-.0003037	.0000968	-.0000245
LSO**	.073667	.0216021	3.41	0.001	.0313277	.1160063	.0174821
Gender1**	-.1.305372	.6316682	-2.07	0.039	-2.543419	-.067325	-.3150051
Poverty**	-2.541832	.6517163	3.90	0.000	1.264491	3.819173	.5350515
Constant	-2.042382	1.685653	-1.21	0.226	-5.346202	1.261438	

An In-depth discussion of factors that determine decisions of the community, i.e., whether or not to participate in common resource management, were given in the literature review part. In this section, only context specific factors, which were assumed very relevant for this study, were discussed. Participation in PFM is the dependent variable. The explanatory variables for logistic estimation were presented in Appendecs 4.
A logistic regression is performed to determine the joint effect of different independent variables on participation. The odds ratio shows the strength of association between a predictor and the responses of interest. The estimated model, taking participation as the dependent variable along with other biophysical, social and economic as explanatory variables, is presented in Table 4-3. The analyzed result showed that from the total explanatory

variables about 54% were come up significantly. The overall significance and fitness of the logistic model is determined by its chi-square value. The chi-square value were Pr = 0.0000 thus the explanatory variables can significantly predict the dependent variable.

Income from forest (IF)

Income from forest does not show any significant effect on participation rejecting the earlier hypothesis that income from forest may have a negative effect on participation. A research conducted by Kugonza et al (2009) in North- western part of Uganda reported that respondent's dependence on forest resources have no significant impact on willingness to participate in community based forest management.

Distance from forest (DFF)

Distance from forest was hypothesized to have negative effects on participation, however; the logistic estimation shows that distance from forest was insignificant in its power to influence household decision on participation. Similar studies by Chhetri (2005) and Kugonza et al (2009) found a negative relationship between distance from forest and community involvement in forest protection, resource utilization and decision-making. This finding is contrast with previous studies which found that people living further away from the forest had more positive attitudes towards conservation, mainly because they did not suffer crop damage by wild animals (Shrestha, 1987).

Distance from market (DFM)

It was hypothesized as a positive influence on decision of people's participation in CBO. But as the forest product harvested by farmers has less in quantity the insignificancy of the variable may be true. Distance to market had a positive influence on perception of 'involvement in decision-making' under the forest development management approach (Shrestha, 1987).

Age (A)

In the analyzed result age has non-significant outcome. Similar result was found on respondent's age has insignificant in its power to influence household decision on participation Alemtsehay Jema. (2010). If forest users have heterogeneous or diverse in their age, ethnicity, settlement pattern and history, and customary right to forest resource access and maximum in size (Mulugeta Lemenih and Demele Teketaye.; 2004), it leads for conflict.

Household size (HHs)

Household size has insignificant in its power to influence household decision on participation. The study conducted by Alemtsehay Jema. (2010) in Goba and Dello, Ethiopia was also found that household size has non-significant power to influence to peoples to make a decision to participate in participatory forest management. PFM as a process is more feasible and effective if forest user group members are kept at relatively manageable medium sizes. The people might consider lesser significance of generated forest income when distribution to many more households or individuals (Mulugeta Lemenih and Habtemariam Kassa, 2011).

In the forthcoming part, the effects of variables are presented and interpreted using their marginal value. The marginal effect explains the marginal effect of explanatory variable on dependent variable in terms of probability. As the logistic model works on the assumption of maximum likelihood, the researcher preferred to interpret the parameters value using probability. Major problems being encountered in community forestry program are due to the lack of involvement of poor, illiterate and women at various activities of community forest management (Lachapelle et al., 2004; Pandey, 1999). The meanings of the coefficients of significant independent variables in this study are presented below.

Education (E)

Educated has a positive effect on the probability of deciding to participate in Participatory Forest Management. The probability of the household being a member of CBO increases when the percentage of educated members in the household increases. It increases a household's chance of participating in CBO by about 27 percentage points. That is, educated households have 27 percent higher probability of joining CBO than there, none educated counterparts. Aryal and Angelsen (2007) also reported that education increases the probability of participation of households being a member of CBO. Chhetri, K. (2005) found that one could argue that the education reduces forest dependency and hence the incentives for being member of CBO. But the positive sign indicates that other effects are dominating: first, education can lead to increase awareness towards the resource conservation and therefore increased participation. Second, educated households may have a better chance to exercise political influence by joining the CBO.

Gender

Women's share of active participation was very low compared to their counter parts which might be because of the cumbersome tasks women shoulder. As indicated in Table 5, the probabilities of male headed households were 30 percent less likely to be participant compared to their female head counterparts. This implies that the hypothesized as women's reproductive tasks and multiple burdens might not constrain their participation. But it agrees with the study made by Musyoki et al (2013) and Maskey et al. (2003) that there is a highly significant relation between gender and participation in forest conservation. Women are quite disadvantaged due to their social and household chores both indoor and outdoor tasks. Therefore, their multiple roles hinder them to

participate actively in conservation activities or attend forest management meetings.

Understanding about community based organization (PU)

The logistic estimation shows that respondents' understanding about community based organization was statistically significant (at the 5% level) and has a positive effect on household decision to participate. Table 5 shows that respondents who have understanding about community based organization were about 40 per cent more likely to participate than those who do not have understanding. Those households that were aware of the CBO had 40 percent higher chance of participating in CBO was found in Kenyan study (Maurice J.O. 2012).

Livestock owned (LSO)

The respondents having high number of livestock had high probability to decide to participate in CBO. It increases a household's chance of participating in CBO by about 1 percentage points. Table 5 shows that an increase in household's livestock owned by one Tropical Livestock Unit (TLU) increases the possibility of household participation by 1.7 per cent. Adhikari et al. (2004) also reported that households who keep more livestock are benefiting more from the community forests (Chhetri, 2005) in Nepal, high probability to participate in community forest management than their respective counterparts. This is very true for pastoralist communities as they need forests and grass for fodder to feed their cattle. This finding is inline with the finding of Agrawal and Chhatre. The study by Agrawal and Chhatre in three Indian states, who used an econometric model and suggest that household's livestock assets are strongly and positively related with the involvement in protection and development of forest resources (Agrawal and Chhatre, 2006).

Land holding size (LA)

As expected, household's farm land has a negative relationship with participation at 10% significance level. Table 5 indicates that households who have one hectare of land decrease the probability of participation by about 7 per cent than those who do not have any farm land. That means households with larger pieces of land may produce a number of products which they would otherwise extract from forests under CBO. In Kenya study each additional acre of land owned area also found to reduce the probability of participating in CBO by 4.8 percentage points (Maurice, 2012). In contrast, Shrestha (1987) in her study found that farm size affects participation negatively.

Poverty

Richer people have more time than the poor and thus can involve in PFM. Poor households do not benefit from common forest management as much as the rich can benefit and their participation in common resources management is minimal. The opportunity cost of poor households is also very high as the time spent for participation can be used to earn money through offering of their labour. As expected, poverty has a significant positive relationship with participation at 5% significance level. Table 5 shows that when household's wealth status is rich it increases the possibility of household participation by 53 per cent. This is inline with the findings of Shahbaz and Ali (2000); Maskey et al. (2003); Aryal and Angelsen. (2007); Alemtsehay Jema (2010) that households' incomes have significant effect on participation in community forest management.

CONCLUSION AND RECOMMENDATION

Conclusion

In Shimelegir State Forest, the people who live nearby it, had less participation as socio-economic and bio-physical factors hinder them to participate in PFM. Result of determinants of participation showed that illiterates increase a household's chance of participate in CBO by about 27 percentage points. Regarding gender, men's was not found to be expected as women had 30% probability to participant than men. Understanding about the aim of PFM programme was found to be statistically significant as expected. As defore suspected that increase their number of livestock by one TLU and acre of land increased by one ha resulting for the probability to participate in CBO increased by about 1.7 and 7 percentage points respectively. The expected hypothesis had compatable with the result as rich households were about 53 per cent more likely to participate than poor households.

Recommendations

Generally, as Shimelegir forest has different important goods and services, PFM is established in 2011 with the objective of conserving the unique biodiversity of the region and improving livelihood of the community. Hence the following recommendations are forwarded for how peoples can improve their willingness to participate in PFM.

Affirmative action needs to be taken into account to streamline gender and equity issues in CFM Agreements. Special sensitization meetings for women, the poor and other vulnerable groups need to be undertaken so as to empower such groups to be able to negotiate and make informed decisions.

Moreover, people's participation requires concentrated efforts from the government, non-governmental organizations which working on agriculture and gender concerns and academic institutions to bring about a positive influence on illiterateness, lesser understanding about PFM with its inclusiveness whether they are poor or female in gender and how they manage their livestock and farm land.

CHAPTER SEX: REFERENCE

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CHAPTER SEVEN: APPENDICES

Appendix 1. Recording format for tree height and DBH

Name of CF ----------Transect line no ----------Plot no ----------GPS X ----------GPS y ----------Altitude ----------

Date: _____

SN	Plot no.	Height (cm)	DBH (cm)

Appendix 2. Household questionnaire

Household questionnaire

This is Abay. I am conducting a research on the project called Scaling- up Participatory Forest Management. So, I kindly request you to provide me with your answer. The information you provide me was used only for academic purpose.

PART I: General Information

Name of the district: _____ village/sub village: _____

Sex: Male_____ Female _____

Age _____

Number of people live/economically dependent in the household: _____

Educational status _____

PART II: PFM + understanding

Do you know about Participatory Forest Management? 1. Yes 2. No

Are you a member of the community forest management group? 1. Yes 2. No

If no, why? _____

If yes, how long it takes from learning to the date CBO is formulated?

1. Less than 2 years 2. 2 – 3 years 3. Not yet formed

If your answer to the above question is not yet formed, why it takes long please specify

_____

_____

How were you involved in the identification of forest user group?

_____

What are the major stages to formulate CBO?

_____

_____

Was that satisfactory: Yes/No comments_____

How were by-laws set?

Who made these decisions?

Was the community consulted about the by-laws? 1. Yes 2.No 3. No idea

Were you involved in decisions making? 1. Yes 2. No

Questionnaire for Household Survey

Household number: _____ Date: _____

Part III: Socio-economic characteristics

A. Household characteristics

Occupation

Types	Male	Female
Agriculture		
Governmental/non-governmental employment		
Business		
Others		

Livelihood strategies (Please ask in part generally 10)

Source of livelihood strategies	Yes/No	Contribution in Percentage
1. Crops		
2. Vegetables and fruits		
3. Livestock		
4. Non timber forest product		
4. Services within the country		
5. Services outside the country		
6. Business		
7. Daily wages		

B. Sources of household income

How much size of farm land do you have?

Forest Product collected during the last 12 months:

Crops and production

Types of crop	Quantity	Price/ unit	Costs of purchased inputs						
			Manure	Fertilizer	Seed	Pesticides	Hired Labour	Rent payment land	Other
Sesame									
Maize									
Millet									
Vegetables									
Fruits									
Cash crop									
Others									

Income from sales of Livestock or animal product during the last 12 months

Product type	Number / quantity	Total cash earned
Cattle		
Pig		
Goat/sheep		
Chicken		
Milk		
Milk product		
Other (specify)		

Source of cash income of the HH (off-farm employment) during the last 12 months

Type of employment	Number of person involved		Cash earned
	Male	Female	
Services (GO and NGO)			
Pension			
Family business			
NTFP			
Labour			
Other (specify)			

Part VI: Community forest and forest management

How much time does it take to reach to the market_____ hr?

How much time does it take to reach to the market_____ hr?

Thank you very much for time!

+

Appendix 3. Tropical Livestock Unit (TLU) equivalent conversion factors

Livestock Type	Conversion factors
Cattle	0.7
Sheep	0.1
Goats	0.1
Donkeys	0.5
Camels	1.0
Horse	0.8
Chicken	0.01

Source: Janke 1982 cited by Ayele Abebe.2012.

Appendix 4. Socio economic characteristics wth hypothesis at the study site

Variables	Specification	Characteristic of variable	Expected Effects
Economic variables			
Annual gross income (poverty)	Poverty in birr from all activities (poor and rich) i.e farm icom + non-farm income	Categorical	+
Income from forest	Income in birr from forest, 0,1,2,3…	Continuous	+
Livestock	Number of livestock they have, 0, 1, 2...	Continuous	+
Land ownd	Size of land they have, 0,1,2,3…	Continuous	_
Social variables			
Understanding about CBO	0 if no understanding 1 if some understanding	Categorical	?
Household size	Number of people living in the household (economically dependent)	Continuous	+
Gender	Sex of respondents	Categorical	+
Age	Age of respondents	Continuous	+
Education	Respondents Education Level (literate and illiterate)	Categorical	+
Biophysical variables			
Distance from forest	Time taken to reach the forest in minutes, 1, 2, 3…	Continuous	+
Distance from market	Time taken to reach the nearby market in minutes, 1, 2, 3, …	Continuous	+

Source Alemtsehay Jema, 2010.