ATTITUDE OF LOCAL PEOPLE TOWARDS COLLECTIVE MANAGEMENT OF PROTECTED FOREST AREAS: THE CASE OF CHOKE MOUNTAINS, ETHIOPIA

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Abstract

The objectives of this study are to describe the Natural Resource Conservation and Tourism Development Cooperative (NRCTDC) members' attitude towards collective management of the protected forest areas (CMPFAs) and to ascertain the determinants of attitude. The survey was conducted from January to June, 2016. The study sites are three districts of Eastern Gojjam Zone, Amhra, Ethiopia. Two NRCTDCs were randomly selected from each district. The research employed six focus group discussions and a household survey of 367 respondents. The independent variables were predicted and measured via ordinal logistic regression model (ologit). They were patterned to multicollinearity, heterosckedasticity, Brant's parallel line regression assumption and other tests. Members' attitude towards CMPFAs accounts 229(62%), 21(6%) and 117(32%) negative, neutral and positive in that order. Lack of transparency, participation in decision makings, clear guideline, and unfair benefit sharing are the major reasons. The ologit estimated threshold parameters are-0.21838 and 0.15925. Gender, illiteracy, non-participation in trainings and living in Sinan and Bibugn districts contributed 25.3%, 23.2%, 27.5% and 55.4% and 56.9% on the odds of developing negative attitude. Thus, designing of participatory strategies to strengthen stakeholders' linkage, grind down the deeply embedded gender discrimination, enhance educational/training opportunities among others is wise to recommend for successful CMPFAs.

Key words: institution, ecosystem, collaboration, participation, transparency

1. BACKGROUND

Protected Area (PA) is defined as an area of land or sea dedicated to conservation and maintenance of biological diversity, natural and cultural resources managed through effective means (UNEP-WCMC, 2004). The establishment of the first PA in the world, Yellowstone, in 1872, was a response to uncontrolled degradation of biodiversity (Pretty and Smith, 2004). In 2005, the world reached a total of 144,296 PAs, covering an area of 19,381,000 km² (Chape*et al*., 2008).

Local communities have an extensive level of appreciation for Pas (Heinen and Shrivastava, 2009 and Triguero-Mas *et al*., 2010). Moreover, the study of White and Martin (2002) confirmed that reserved forests owned by local communities constitute 11% of the world's forests. The share had increased to 13% in 2008 (Sunderlin*et al*., 2008). Thus confirming the failure of "state control" that Hardin (1968) suggested solving the problem of the commons (Ostrom, 1990 and Baland and Platteau, 1996). Thus, institutions for collective action are basic for the economic and environmental well-being (Jodha, 1986).

Literatures revealed cooperatives to be successful in managing communal property resources (CPR) in several countries (Dasgupta, 2001). But, the quality of collective action depends on the institutional set up, enforcement, and the attitude of participants. Hence, assessing the institutional settings and factors affecting collective natural resource management (NRM) is vital (Alemtsehay, 2010).

1.1 Introduction

An attitude is the evaluative dimension of a concept (Ajzen and Fishbein, 1977). Attitudes are strong correlates of actual behavior and thus can be used to predict people's behavior, their responses, acceptance, or reaction to development and conservation efforts (Shibia, 2010 and Tessema *et al*., 2010). Borrini-Feyerabend *et al*. (2004) defined collaborative management as partnerships for NRM that involve local people as main stakeholders. Hence, a discussion on the conservation of natural resources requires a thought on major stakeholders' attitude as it demands a collective action.

The global increase in the area under community forests depicts the contribution of varied forms of participatory forest management (PFM) approaches (Agrawal, 2007). Hence, the establishment of PAs alone cannot safeguard perpetuation of biodiversity (Hayes, 2006 and Ban *et al*., 2008). Rather, incorporating a more participatory approach into PAs is critical to foster the implementation of conservation strategies (Anthony, 2007 and Reed, 2008).

A study on conservation of tropical rainforests at 16 PAs in 11 African countries also showed that attitude of local people to be the strongest correlate of success (Struhsaker *et al*., 2005). A vibrant understanding of the local people's attitude also helps in selecting and assessing conservation management options and to avoid potential conflicts (Hu, *et al*., 2006). Yet, such relationships are often ignored in numerous conservation initiatives (Buch-Hanen, 1997 and Maikhuri *et al*., 2001).

Ensuring the participation of local community in the management of forest resources is mentioned as a critical input to protect and improve Ethiopia's forest resources (EPA, 2003). As it upholds the acquisition of power by communities to make their own decisions on matters that affect their life and environment (EPA, 1997). Thus, Ethiopia introduced the PFM approach as a remedy to the failures of the top-down approaches (Keeley and Scoones, 2000). Then, it confirmed to promote sustainable forest management and improve the livelihoods of local people from the PFM approach (JICA, 2006 and PFMP, 2006).

Local communities are important forces in solving the environmental crisis (Praneetham *et al*., 2012). The study of Triguero-Mas *et al*. (2010) strongly advocates the prominence of local people's support for sustainable management of forest resources. Though such a commitment emanates from the ocean of the attitude, it is wise to care that local community's perception and their priority might differ from that of externals (Matta and Alavalapati, 2006). Thus, the perception towards the NRM and their priority affects their attitude. Understanding the attitudes of local communities is essential for protected areas management (Ogunjimi *et al*., 2012). Therefore, a comprehensive understanding of the local people's attitude is a management priority for the success of community-based forest management (Macura*et al*., 2011).

Contemporary studies take up local people's attitudes as a major topic; mostly related to conservation projects or wildlife and nature reserve areas (Lee *et al*., 2009). In community-based forest management context, participants' perception of the purpose and the implication of the arrangement towards their interest and thus the attitude they form influence the willingness and commitment (Husain and Bhattacharya, 2004; Gelcich *et al*., 2005). But these studies tried to identify sources of conflicts, and propose solutions for future policy decisions. Conversely, the studies of Kideghesho *et al*. (2007), Lee *et al*. (2009) and Tomicevic *et al*. (2010) stressed on a deeper understanding of important attributes that determine people's attitudes. Yet, very few studies have looked into the underlying drivers of attitude for collective management of protected forest areas (PFAs). Specially, study on the determinants of attitude for collective forest management in the Choke Mountains is

completely inattentive. Hence, this study is devoted to describe the Natural Resource Conservation and Tourism Development Cooperative (NRCTDC) members' attitude towards collective management of the PFAs and to ascertain the determinants of such attitudes.

2MATERIALS AND METHOD

2.1 Description of the Study Areas

The Choke Mountains are considered as one of the East African Afro-montane Biodiversity Hot Spot (Simane, 2011). The Biodiversity in this geographic region is highly threatened, the vegetation cover and the soil are degraded and the fertility is depleted because of long history of human settlement and the ever-mounting population pressure. There is also an abject poverty together with a continuous downward spiral alternative livelihoods opportunity.

The major part of Choke is found in *Bebugn, Senan, DebayTilatgin, Machakel* and *Hulet Ejju Enessie* in that order of broad area coverage. Its upper catchment is located between $10^0$33'06" to $10^0$50'24" North latitude and $37^0$42'36" to $37^0$58'24" East longitude. Topographically the watershed lies in the altitudes range of 2100 to 4413 (at the pick of *Talo*) m.a.s.l. It is a home of biodiversity and a source or 59 rivers and 355 springs (ORDA, 2011).

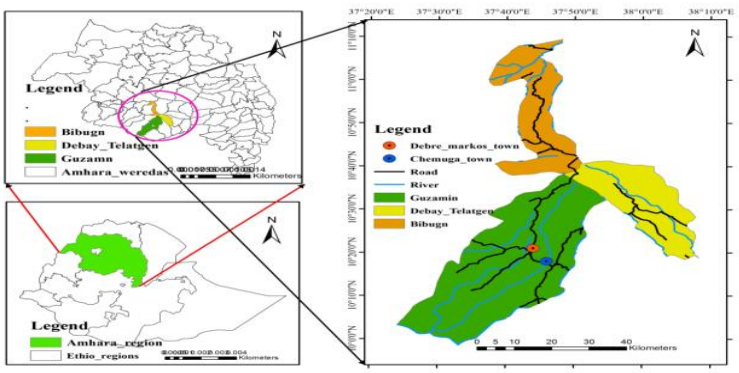

Figure 1.Map of the Study areas coordinate system WGS1984 UTM zone 37^0 N projection.

The Choke Mountains are part of the Nile '*Abay'* River Basin, which provide the source of many tributaries to the Nile River. The major upper catchments (i.e., under study) that drain from the Choke Mountains are InatMuga, GilgelMuga, Temcha, Zimbl, TilkuAbeya, TinishuAbeya, Chemoga, Godeb, Tijan, Tefe, Teme, Azwari, Komed and Oromo Meshageriya, Aybab, Sede, Jigay and Gula. However, the Blue Nile basin, wetlands are given limited attention.

2.2 The Study *Weredas*

The study was conducted in three weredas of East Gojjam Zone of theAmhara Region, Ethiopia. The *weredas* are named DebayTilatgin (1), Sinan (2), and Bibugn (3). These w*eredas* are purposively selected for their higher area coverage of the Choke Mountains. Besides, these*weredas* were getting much courtesy of several stakeholders; Ethiopia Environmental Protection Authority (EPA), United Nations Development Project (UNDP), Organization for Rehabilitation and Development of Amhara (ORDA) and others for years. Of these, the UNDP had established eight, eight, and five NRCTDCs having a total of 4441;1570, 1402 and 1469beneficiaries in *wereda* 1,2 and3 respectivelyin 2009. Every NRCTDC was carefully selected a degraded watershed area extending from the Choke Mountains to manage and promote it into a future tourism sites (ORDA, 2011).

2.3 Sampling and Sample Size

The field work was conducted from January to June 2016. The target populations were the NRCTDCs in *weredas*1, 2 and 3. The study used Yamane's (Yamane, 1967) formula to determine the total sample size to be 367.

$$n = \frac{N}{1 + N(e)^2} \text{---------- (1)}$$

Where, n is the sample size, N is the population size, and 'e' is the level of precision (95%).

Two NRCTDCs were randomly selected from each *wereda* as a sampling frame via a lottery system. Thus, Yegomira and Weyifen Adkim, Chemoga and Temicha, and Gedeb Giorgisand Meleya were picked from *wereda* 1, 2 and 3 in that order.

The sample size from each cooperative was determined using a proportional to size simple random sampling technique. Finally, the responding households were nominated through a systematic random sampling technique from the respective NRCTDCs members' list (Table 2).

2.4 Data Collection Methods

The study consumed both qualitative and quantitative data. The data collection process includes focus group discussions and household surveys using a checklist and an interview schedule respectively. Focus group discussions (FGDs) with 20 participants; four from administrators, "strong" farmers, "medium" farmers, women house heads and landless youth were conducted in sampled cooperatives. However, there are also two mini FGDs conducted separately with youth and women members in each FGD.

The interview schedule used both open and close-ended questions. It was pretested, revised and translated to the local language, *Amharic*. Preliminary survey, 40 *Weyifen Adkim* NRCTDC members, was used to check the clarity and reliability of items. They replied to the 12 items according to their strength of agreement using five level scores (Bass *et al.*, 1974).But they were not included in the main sample group (Table 3).

Factor analysis (Principle Component Analysis) was used to reduce the Likert scale responses into manageable factors that were then subjected to Cronbach Alpha so as to determine the reliability of the item responses in measuring attitudes and determining motives towards CMPFAs. A Cronbach's Alpha value of at least 0.7 is considered reliable (de Vaus, 1996). The analysis approved six items to be reliable. Chi-square test was used to determine factors that influence the respondents' attitudes.

The Cronbach's Alpha test for reliability for the responses of pre-test sample was 0.786, thus showing inclination towards agreement with the scale statements.

Table1. Reliability Statistics (n=40)

Cronbach's Alpha	Cronbach's Alpha based on standard items	Number of items
0.786	0.771	6

Source: own Pre-test data 2018

Table 2. Sampling procedure, sampled cooperatives and selected respondents

		Cooperative Members' Description			
Weredas	**Selected Kebeles**	Men	Women	Total Population	Sampled units
DebayTilatgin	Yegomira	98	20	118	26
	WeyifenAdkim (-40)	130	34	164	28
	Total	188	54	242	54
Sinan	Chemoga	202	83	285	63
	Temicha	180	150	330	73
	Total	382	233	615	136
Bibugn	GedebGiorgis	332	99	431	96
	Meleya	179	186	365	81
	Total	511	285	796	177
Study sites total		**1079**	**574**	**1653**	**367**

Table 3. Items-total statistics (n=40)

	Mean, if item deleted	Variance, if item deleted	Corrected item-total correlation	Squared multiple correlation	Cronbach's Alpha if item deleted
Members have clear management idea	17.15	6.131	.636	.448	.731
Members share benefits equally	17.03	7.922	.557	.483	.751
Management practices are smart	17.08	6.738	.596	.407	.739
The forest shows greater improvement	19.25	9.885	.086	.107	.825
The leaders are transparent enough	17.33	7.097	.793	.725	.699
Members' participation in decision making	17.05	7.126	.570	.609	.745

2.5 Data Analysis Techniques

Dependent variable

The NRCTDC members' attitude towards the collective management of the PFA is set in to three ordinal constructs. Hence, it is represented by '1', '2' and '3'for negative, undecided and positive attitudes respectively. A composite score based on the mean value of the different items was used to measure the constructed (Conner and Armitage, 1998). Models for ordered responses have their origin in the statistical literature.

Though Aitchison and Silvey (1957) proposed the ordered probit model, Snell (1964) suggested the logistic for mathematical simplicity to analyze orderly ranked classes. Thus, the analysis was made using STATA V.13 and SPSS V.22 statistical software.

The first comprehensive treatment of ordered response models appeared with the work of McKelvey and Zavoina (1975) who generalized the model of Aitchison and Silvey to more than one independent variable. The idea assumed the existence of an underlying continuous latent variable related to a single index of explanatory variables and an error term and to obtain the observed categorical outcome. General surveys of the parametric as well as the semi and non-parametric literature were given, for example, in Bellemare *et al*. (2002) and Stewart (2004), the two latter references in particular for the semi- and non-parametric treatments of ordered data. Thus, the gologit (generalized ordered logit) model can be written as:

$$P(Y_i > j) = \frac{\exp(\alpha_j + X_i\beta_j)}{1+[\exp(\alpha_j + X_i\beta_j)]}, \text{j} = 1, 2, .., \text{M} - 1$$

The unconstrained model gives results that are similar to running a series of logistic regressions, where first it is category 1 versus all others, then categories 1 & 2 versus all others, etc. The unconstrained model estimates as many parameters as mlogit does, and tends to yield very similar fits. Hence, an ordered logit (ologit) model is a special case of the gologit model, where the betas are the same for each j.

$P(Y_i > j) = \frac{\exp(\alpha_j + X_i\beta)}{1+[\exp(\alpha_j + X_i\beta)]}$, j = 1, 2, ..., M − 2 Thus, it is explained as follow;

This implies that: $P(Y_i = 1) = 1 - \frac{\exp(X_i\beta - \kappa_i)}{1+[\exp(X_i\beta - \kappa_i)]}$; $P(Y_i = j) = \frac{\exp(X_i\beta - \kappa_{i-1})}{1+[\exp(X_i\beta - \kappa_{i-1})]} - \frac{\exp(X_i\beta - \kappa_i)}{1+[\exp(X_i\beta - \kappa_i)]}$ $j = 2,,,,,M-1$

$P(Y_i = M) = \frac{\exp(X_i\beta - \kappa_{M-1})}{1+[\exp(X_i\beta - \kappa_{M-1}]}$

Independent variables

The study assumed the following explanatory variables to influence the dependent variable, attitude. These areage, literacy level, sex of the house head, district, market and PFA distance, income from livestock, participation in tree selling, access to focused trainings and social role.

2.6 Potential Bias and Limitation

The costs incurred and benefits created by PFAs strongly influence the peoples' attitude (Heinen and Shrivastava, 2009 and Shibia, 2010). However, in this particular study they were not considered in our model as these data were neither collected nor available from other sources.

3 RESULTS AND DISCUSSION

3.1 Members' Attitude on CMPFAs

Respondents were encouraged to reveal and rate their subjective judgement to every item. The attitude was computed through summing up their responses to every item using SPSS version 22 software. The majority of the respondents, 184 (50%) showed their agreement while, 116 (31.6%) remain undecided and only 67 (18.4%) expressed their disagreement helping to comprehend the improvement observed on the protected forest. But they explained their involvement in the PFAM to only be for the fear of penalties bestowed for their non-attendance. This contributed for the progress on the protected forest (PF) though it cannot rectify the latent cracks. But, the lack of transparency among leaders and lack of participation on decision makings counting 216 (58.8%) and 205 (55.9%) compel farmers to develop negative attitude towards collective management of the protected forest. Likewise, the study by Silori (2007), reported the lack of local community's involvement in the decision making processes to critically affect the development of a negative attitude toward PAs.

The majority of respondents 262 (71.4%) tend to disagree with the item "Benefits are equally shared among members." First, all of the PFAs did not start providing benefits, except the grass. Generally, people tend to appreciate protected areas if the benefits gained from them offset the associated costs (Ormsby and Kaplin, 2005). However, respondents reveal trainings and the cooperatives' finance to foully be corrupted by leaders. Besides, most leaders are *kebele* administrators and this makes fighting corruption so complex. These bolted members' not to vibrantly appeal their shares. Likewise, the results of Agrawal (2001) and Berkes (2008) reported the tendency of local elite to gain all benefits when new managing groups are formed and the structure of society is reflected in the functioning of those groups.

Moreover, majority of the respondents, 232 (63.2%) with 169 (46.0%) mild and 63 (17.2%) strong disagreement arbitrated the management practices not to be smart enough to ratify the PFAs into a tourism site. This further urges them not to presume the benefits of their effort in the short run and consequently to develop a negative attitude towards CMPFAs. Similarly, the studies of Ormsby and

Kaplin (2005) and Allendorf (2007) reported people's perception on the management practices to affect their attitude towards the PFAs. A negative attitude entails high transaction costs in conservation and development endeavours (Baral & Heinen, 2007 and Ray & Bhattacharya, 2013).

The aforementioned points and related circumstances afterward urge the cooperative members not to have clear idea on how best to manage the PFA computing 267 (72.7%). It in turn influences their focus on the future fate of the protected forest areas. The most probable elucidation seems to be the lesser involvement of cooperative members during the conception, planning, monitoring and evaluation of the cooperative.

3.1.1 Socio-economic characteristics

Farmers of the study areas own an average farm lands size of 0.77 hectare. Whereas, 105 (28.6%), 22 (6%) and 30 (8.2%) respondents are having 0.5, 0.25, and 0 hectare of farm land. Nevertheless, those 29 landless members used to manage others' land through renting or sharing modalities. However, the average family size of the respondents is 5.68 (Table 5).

Table 4. Members' attitude by districts

Districts	Negative	Unclear	Positive
Debay T.	(16.7%) 9	(3.7%) 2	(79.6%) 43
Sinan	(70.6%) 96	(6.6%) 9	(22.8%) 31
Bibugn	(70.0%) 124	(5.7%) 10	(24.3%) 43
Total	(62%) 229	(6%) 21	(32%) 117
Statistics	**Value**	**df**	**Sig. (2-S)**
Pearson χ^2	67.139a	4	.000
Likelihood	63.806	4	.000
Linear Association	37.113	1	.000
Cramer's Variance	0.302	---	.000

Source: own survey 2018

Table 5. Distribution of respondents based on their attitude scale (n=367)

Attitudinal statements (items)	Levels of agreement										Statistics		
	SAG*		AG		UND		DAG		SDAG				
	#	%	#	%	#	%	#	%	#	%	1*	2	3
We share benefits equally	20	5.4	38	10.4	47	12.8	177	48.2	85	23.2	3.7	4	1.2
Decision making participation	40	10.9	85	23.2	30	8.2	127	34.6	85	23.2	3.4	4	1.8
We are using smart practices	4	1.1	20	5.4	104	28.3	173	47.1	66	18.0	3.8	4	0.7
We have clear PFM idea	67	18.3	100	27.2	35	9.5	125	34.1	40	10.9	2.9	4	1.8
We saw progress on the PFA	51	13.9	133	36.2	115	31.3	63	17.2	5	1.4	2.6	2	0.9
The leaders are transparent	26	7.1	57	15.5	64	17.4	125	34.1	95	25.9	3.6	4	1.5

* 1, 2 and 3 represents the mean, mode and variance of the specific items respectively.
* SAG= strongly agree; AG= agree, UND = undecided; DAG = disagree and SDAG= strongly disagree
Source: own survey 2018

This made most farm households incapable to safeguard the annual family food demand. Moreover, each *wereda* clenches more than 5000 landless youths. This further tenses the demand to have and expand farm lands by those landless and with higher family size households respectively. This in turn places maximum pressure on the PFAs.

Knowledge towards rules and regulations of the NRCTDCs'

Forest rules are not limited to formal, official rules and may include norms, rules, and traditions defined by local forest users (CIPEC, 2002). It is recognized and understood by the majority of forest users. In the case of protected forest area, a forest may be legally designated as protected, but its respective codes of conduct will not be considered as rules unless they are recognized by cooperative members.

Table 6. The family, own and total farm size

Statistics	Family	Own farm	Total farm
Mean	5.68	0.77	0.98
Median	6.00	0.75	0.75
Mode	5.00	0.50	0.50
St. dev.	1.91	0.45	0.55
Variance	3.65	0.20	0.30
Skewedness	0.18	0.72	1.02

Source: own survey 2018

However, the NRCTDCs' rule and regulations are set, agreed and written by the members and are serving their purposes. The more the cooperative members know the rules and regulations, the higher the tendency to develop a negative attitude towards collective management of PFA (CMPFAs) (Fig. 2).

This result strengthened by the study of Heinen and Shrivastava (2009) that confirmed the members' higher level of awareness on the rules and regulations to have a negative influence on their attitude towards the CMPFA. This tendency, most probably, might emanate from their knowledge on the gaps in the rules and regulation to attain their future goal together with the lack of transparency of the cooperative leaders to consider and accommodate members' feelings in an open manner.

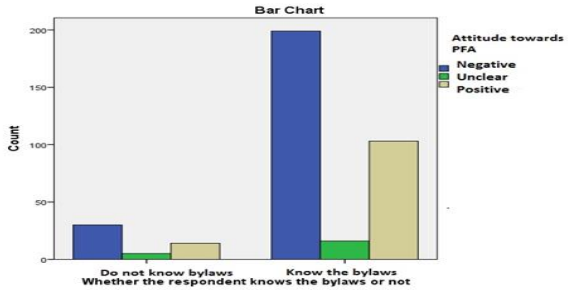

*Figure 2.*Relationship of attitude with knowledge of rules and regulation.

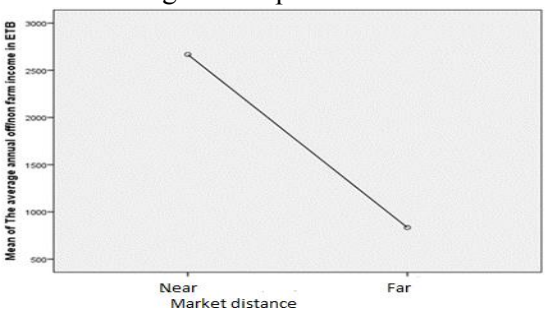

Figure 3. Market distance Vs off/non-farm income**.**

The relationship between market distance and respondents' off/non-farm income showed a positive relationship. This is a potential area for stakeholders to target towards providing trainings of income generating activities for those who are living nearer to the market places.

This has a dual contribution. First, participating in off/non-farm activities increases the households' income that helped to reduce their dependence on primary activities. Second, such higher income improves their access to agricultural technologies that increase land and labour productivity than looking for additional farm land that is still competing with the forest lands. Furthermore, the ordered logistic regression result vividly showed those household heads trained with income generating schemes has higher tendency to develop a positive attitude than those not trained towards the CMPFAs.

In a nut shell, the cooperative members are managing the PFAs under such a cuddled status quo with the expectation of fetching future benefits. But, they are not getting any benefit though the management has aged six solid years. Among practical reasons; the selection of tree species that need longer time to attainbenefits (Hagenia abyssinica "*Koso*", Oleaafricana "*Weyira*" and Juniperus procera "*Tsid*") is the one. Moreover, lack of clear guideline on how to manage and distribute benefits from the PFA is putting a gloomy shade on members' attitude. For instance, the most successful *Yegomira* NRCTDC did not distribute the five years aged grass (fig. 4).

Figure 4.Yegomira Kebele PFA(Debay Tilatgin).

Moreover, farmers are grieft from a strong rivalry feeling with the newly established active farmers' organization, for similar purpose, by the Sustainable Land Management (SLM) project. Again, the fall of technical support and incentives (e.g. farm implements) from stakeholders are wilting members' morale not to assertively take part in the collective management of the PFA.

3.2 Determinants of Attitude towards CMPFA

All of the attitudinal items have significant relationship to the respondents' general attitude. This shows the items' validity to measure the attitude. Beside, the variability in the level of significance and correlation to each other again richly show how they are addressing varying aspects of the attitude towards collective management of PFAs (Table 7 and 8).

Table 7. Within items' correlation

Attitude items	CLER MGT	BNT SHR	SMR PRC	FRT PRG	TRS PAR	PR DC
CLERMGMT	1					
BENESHR Corr.	.140					
Sig. (2-tailed)	.007	1				
SMRTPRAC	-.004	.133				
	.933	.011	1			
FORSTPRG	-.012	.028	-.01			
	.826	.596	.892	1		
TRNSPARC	.010	.312	-.15	.172		
	.854	.000	.003	.001	1	
PARTDECS	-.008	-.11	-.06	-.09	.168	
	.874	.036	.274	.071	.001	1

Source: own survey 2018

Table 8. Items' correlation and regression

	Correlation		Regression	
GATTITUDE	Coef.	P	Coef.	P>t
CLERMGMT	-0.6190	0.000	-.1719	0.000
BENESHAR	-0.6033	0.000	-.0973	0.002
SMRTPRAC	-0.2700	0.000	-.1269	0.000
FORSTPRG	-0.4412	0.000	-.1069	0.000
TRNSPARC	-0.7704	0.000	-.3049	0.000
PARTDECS	-0.5771	0.000	-.1427	0.000
_cons			4.8755	0.000

N= 367, F (6,360)=168.12, Prob> F= 0.000,
R2 = 0.7370, Adj R^2 = 0.7326, Root MSE = 0.4773
Source: own survey 2018

The independent variables were predicted and measured using an ordinal logistic regression model. These variables were of personal, socio-economic, institutional and PFA related variables. They were patterned for their association to the other independent variables towards multicollinearity, endogeneity, and heterosckedasticity conditions. As table 12 depict they show no relations to one another except for the district 2 and district 3 that are beneficial for further *wereda* level analysis. The household's annual average income from the sale of livestock has a negative but significant relation with the corresponding attitude. This, most probably seems to emanate from the respondents' higher demand for free access to grazing areas for their livestock than managing the PFA from which they are getting no benefit at all. Hence they might consider the PFAs responsible for their lost income advantage from livestock selling.

Parallel line regression Assumption

This assumption is run to check the fitness of the model to conduct the attitude test. Hence, as the Brant test is found to be non-significant to satisfy the parallel line assumption it implies that the ordered logit test is fit to make the attitude test (table 10).

Table 9. Relationship and significance level

	Statistics	Age	Livestock Income
Attitude	Correlation	-.039	-.228
	sig.(2-tailed)	.456	.000
	Df	365	365

Source: own survey 2018

Table 10. Parallel regression assumption test

Tests	Chi^2	Df	P>Chi2
Wolfe Gould	5.312	11	0.915
Brant	5.367	11	0.912
Score	14.36	11	0.213
Likelihood ratio	17.09	11	0.105
Wald	14.29	11	0.217

Source: own survey 2018

The model chi-square result is 144.87 with an 11 degree of freedom. This is significant to ascertain the considered variables are having strong influence on members' attitude towards CMPFAs. The threshold parameters of -0.21838 and 0.15925 are explained with three possible values for Y (i.e. M = 3), the values for Y are; $Yi = 1 \text{ if } Y^*i \text{ is} \leq -.21838$

$$Yi = 2 \text{ if } -.21838 \leq Y^*i \leq .15925$$

$$Yi = 3 \text{ if } Y^*i \geq .15925$$

Usually, we look at the sign and level of significance for coefficients in interpretation. This helps to plug in hypothetical or real data values to get a better sense of meaning.

Table 11. Regression coefficients of variables

GATTITUDE	Coef.	Std. Err.	t	(P>t)
AGERES	-0.0042	0.0063	-0.67	0.502
SEXHH	0.3041	0.1040	2.92	0.004
EDUCATION	0.3253	0.0904	3.60	0.000
INCMLIVS	-0.0001	0.0001	-0.70	0.487
MRKTNEW	0.0710	0.0856	0.83	0.407
FORSTDIS	-0.1360	0.0808	-1.68	0.093
PARTRESEL	0.0795	0.0902	0.88	0.379
INCTRAIN	0.4016	0.0863	4.65	0.000
DISTRCTN2	-1.1430	0.1470	-7.78	0.000
DISTRCTN3	-1.0431	0.1391	-7.50	0.000
SOCLROLE2	0.2580	0.1103	2.34	0.020
_cons	2.1491	0.2802	7.67	0.000

N= 367, F(11, 355) = 16.6, Prob. > F = 0.0000,
R^2 = 0.3393, Adj. R^2 = 0.3189, Root MSE = .76178
Source: own survey 2018

Gender

Being a woman has contributed a 25.3% increase in the odds of developing a negative attitude whereas being male has contributed 20.8% increase in the odds of developing a positive attitude towards CMPFAs, assuming other variables to remain constant. Among the most probable reasons urging most women to develop a negative attitude towards the CMPFAs; lower farm land size (Only 5 (6.1%) of women have a farm land holding size between 0.75 and 1.5 hectare), lower household labour, fewer access to additional income generating trainings, only 17(20.7%) women, lower rate of participation in the progress report of their NRCTDCs'(only 25(30.5%) women, lower frequency of extension visit, no woman as compared to 114 (40.0%) men gets most frequent extension agents' visit. Women,13 (15.9%) compared to 109(38.2%) men, have lower involvement in other social roles that helps to widen their access to several training and income earning opportunities considered to be crucial (Appendices 1 and 2).

All these evidences vividly demonstrate us how women are systematically marginalized. Such a marginalization fires back the society and exacerbates the existing natural resource degradation. The result of this study goes in line with the findings of Guijt & Shah, (1998) that explained women to be excluded in a community due to gender, economic, social, cultural and political characteristics that give some groups more power and more claim over resources.

Moreover, Agarwal (2010b) reported that "marginalizing women negatively impinges women's attitudes towards conservation and development." Women, therefore, will directly or indirectly be forced to look for means of increasing their income and consequently be engaged in off/non-farm activities 52 (63.4%) to fill their household deficits. On the other hand, the CMPFAs demand their time. Thus, these interrelated factors compel them to develop a negative attitude towards CMPFAs.

Literacy level

Being illiterate contributed 23.2 % increase in the odds of developing a negative attitude towards while being literate shows a significant, 19.4% increase in the odds of developing a positive attitude towards CMPFAs. Being literate is gives opportunities to involve members in additional social role, 110 (90.2%) literates do involve in additional social roles as compared to 12 (9.8%) illiterate respondents. Similar number of, 137(93.8%) and 9(6.2%) literates and illiterates respectively had participated in the management of protected forest trainings as well as financial progress report meetings. Moreover,109(75.7%) and 35(24.3%) literates and illiterates respectively participated in additional income fetching trainings(Appendix 3).

The findings indicate that attitudes of the population sample with relatively higher levels of education shows greater influence by parameters. This concurs with findings of a study by Bandara and Tisdell (2002) strongly advocates education to plays a critical role in shaping the attitudes and perceptions of local communities towards natural resource conservation (Romanach*et al.*, 2007). Though such studies advocated that educating women to contribute much on the tendency to develop positive attitude towards natural resource conservation and development, the result of this study depicts that in an environment where being literate does not help much to get access to employment opportunity.

Other factors that determine their access to economic resources and capacity building trainings play critical roles in marginalizing women than the level of literacy they hold. This further strengthens the result of Infield (1988) that showed how economic factors positively influence attitude.

Distance of PFAs

Residing a beat far from the PFAs has contributed 11.2% on the odds of developing negative attitude whereas residing near has contributed 9.6% on the odds of developing a positive attitude towards CMPFAs though it is at 5% significant level. This may be due to that managing the PFA is taking their time than those residing nearer. Plus it might be due to the lack of sense of ownership.This is against the results of J. P. Lepetu, and H. Garekae (2015) and Shibia (2010) which declared that "the attitudes of local people living adjacent to forest reserves reflect suspicion and mistrust on forest management policies" and "local communities living adjacent to protected reserves have negative attitudes than those who are far away.**"**

Income generating trainings

Respondents' access to participate in trainings that help them to fetch additional income has contributed 24.2% on the odds of developing a positive attitude whereas not having access to such training has contributed a 27.5% on the odds of developing a negative attitude towards CMPFAS. This goes in line with the study of Sifuna (2010) that make clear on the contribution of the benefits that local people obtain from protected areas in different forms to create a positive attitude towards CMPFAs. Also, as the NRCTDCs were established to give future economic and non-economic opportunities, trainings might widen their view and enhance their understanding towards the benefits.

District (*wereda*)

Being members of the NRCTDCs of *Sinan* and *Bibugn* had contributed 55.4% and 56.9% on the odds of developing a negative attitude towards CMPFAs respectively. Lower success rate of the PFAs in *Sinan* and *Bibugn* and the existing weak linkage among actors of the PFA system are the reasons.The studies of Hunter and Gibbs(2006) and Lindsey *et al*. (2005) assured the place of residence and the type of land use practices to influence people's attitudes in that order. Several authors also confirmed that attitude toward community managed forests to vary within districts for the reasons of different management objectives and history, levels of access to resources, andcosts orbenefits created (Allendorf, 2007; Heinen and Shrivastava, 2009).

Social role

The mere participation of cooperative members in *kebele* administrations has contributed 14.2% on the odds of developing a positive attitude towards the CMPFAs. It also confirmed that not participating in the *kebele* administration to contribute 16.0% in the odds of developing a negative attitude, though at 5% significance level, towards the CMPFAs. As such participation widens their opportunity towards several trainings and income opportunities that would help to broaden their view point on the natural resource management and to support their annual income for satisfying their household demands. Therefore, these helped them to have the knowledge and the time for the management of PFAs.

Table 12. Chi-square estimates of the categorical variables

Variable and attributes		Attitude towards the PFAs			Pearson Chi-Square			Linear-by-Linear Association		
		Negative	Unclear	Positive						
		No. (%)	No. (%)	No. (%)	Val.	df	Sig(2-s)	Val.	df	Sig(2-s)
Education	Illiterate	94 (76.4)	5 (4.1)	24 (19.5)						
	Literate	135 (55.3)	16 (6.6)	93 (38.1)	15.6	2	.000	15.1	1	.000
Gender	Woman	69 (84.2)	2 (2.4)	11 (13.4)						
	Man	160 (56)	19 (7)	106 (37)	21.3	2	.000	20.0	1	.000
Market distance	Near	145 (63.3)	14 (6.1)	70 (30.6)						
	A beat far	84 (60.9)	7 (5.1)	47 (34.0)	.575	2	.750	.357	1	.550
PFA distance	< 30 min	98 (55.1)	12 (6.7)	68 (38.2)						
	30 <X< 60	131 (69.3)	9 (4.8)	49 (25.9)	7.95	2	.019	7.57	1	.006
Income training	Not trained	162 (72.6)	10 (4.5)	51 (22.9)						
	Trained	67 (46.5)	11 (7.6)	66 (45.9)	25.5	2	.000	24.7	1	.000
Tree selling	Not Part.	150 (68.2)	10 (4.5)	60 (27.3)						
	Participate	79 (53.7)	11 (7.5)	57 (38.8)	7.93	2	.019	6.96	1	.008

Source: survey data 2018

Table13. Parameter estimates of the ordinal logit model for the independent variables

GATTITUDE	Coef.	Std. Error	Z/ (P>Z)	dy/dx Coef.1	Z (P>Z)	dy/dx Coef. 2	Z (P>Z)	dy/dx Coef. 3	Z (P>Z)
AGERES	-.01427	.02013	-0.71 0.478	.00315	0.71 0.478	-.0005	-0.70 0.485	-.0027	-0.71 0.478
SEXHH	1.3562	.40774	3.33 0.001	-.2530	-4.25 0.000	.04512	2.85 0.004	.20787	4.33 0.000***
EDUCATION	1.1416	.33053	3.45 0.001	-.2316	-3.89 0.000	.03738	2.78 0.005	.19421	3.91 0.000***
INCMLIVS	-.0001	.00009	-0.84 0.403	.00002	0.84 0.402	-2.66e-0	-0.82 0.413	-.0000	-0.84 0.402
MRKTNEW	.21236	.27832	0.76 0.446	-.0469	-0.76 0.446	.00689	0.75 0.453	.03997	0.76 0.446
FORSTDIS	-.5067	.25763	-1.97 0.049	.11177	1.98 0.047	-.0161	-1.80 0.072	-.0956	-1.98 0.048**
PARTRESEL	.17008	.27495	0.62 0.536	-.0376	-0.62 0.536	.00552	0.61 0.541	.03203	0.62 0.536
INCTRAIN	1.2228	.27227	4.49 0.000	-.2748	-4.62 0.000	.03291	3.18 0.001	.24189	4.45 0.000***
DISTRCTN2	-3.1932	.51002	-6.26 0.000	.55397	8.26 0.000	-.0737	-4.35 0.000	-.4803	-7.36 0.000***
DISTRCTN3	-2.9140	.48398	-6.02 0.000	.56879	7.49 0.000	-.0598	-4.06 0.000	-.5091	-6.70 0.000***
SOCLROLE2	.68742	.31583	2.18 0.030	-.1604	-2.11 0.035	.01827	2.29 0.022	.14214	2.03 0.042**
cut1	-.2184	.89837	(Ancillary parameters)						
cut2	.15925	.89858							

- "**" and "***" indicates the level of significance at 5% and 1% respectively
- N = 367, LR chi2(11) = 144.87, Prob. > chi2 = 0.0000, Pseudo R2 = 0.2400, Log likelihood = -229.4028 and Latent SD (Neg) = 0.67087487, Observed SD (Neut) = 0.07746408Observed SD (Posit) = .25166106

Source: survey data 2018

4. CONCLUSION AND RECOMMENDATION

4.1 Conclusion

Currently, protected areas are getting ceiling attention as it helps to conserve the world ecosystem. Research results assured the management of the PAs by the Local community to show greater success. The Choke Mountains are the home for biodiversity and a water tower for the surrounding zones. It contributed for 54 big and full season rivers for the Blue Nile (*Abay*) river magnifying its contribution to the renaissance hydro electric dam. And even it is playing a critical role for the Sudan and Egypt economy, making it a regional resource.

The study was conducted in Debay Tilatgin, Sinan and Bibugn *weredas* of the Eastern Gojjam zone of the Amhara Regional State, Ethiopia. Respondents of the study areas hold an average farm land size of 0.77 hectare with a mode of 0.50 hectare. However, the average family size is 5.68 persons with a mode of 5.0 persons per household. Thus, it is hard to get production for the household annual consumption without a supplementary income. Selling fire wood and livestock fattening are the common supplementary income sources. But they put elevated pressure on the natural resource base. Literacy level has a direct tie with involvement in income generating trainings and extra social role. Besides, it has a positive link with participation in off/non-farm activities. These create several capacity building and income earning occasions to amend the household deficit and reduce dependence on the natural resource base.

The NRCTDCs members' involvement since the conception of the idea was so low. This idea was first emanated from the UNDP small grant project that for long supported the Ethiopian Environmental Protection Authority. The contribution of UNDP from inception to enabling the cooperatives legal entities was critical. Members boldly revile their passive participation in the processes of designing the rules and regulations and nominating the leaders of their cooperatives. Moreover, lesser participation in the decision making processes, lack of clear guideline on how best to manage the PFA and lack of transparency among leaders about the financial and other resources management erode members' confidence on the future of their cooperatives. All these influenced most members to develop negative attitude towards the CMPFAs.

The study further acknowledged the determinants of members' attitude towards CMPFAs. Thus gender, literacy level, participation in trainings and progress reports, involvement in additional social roles are the critical ones. For instance, gender discrimination marginalizes them from resource ownership, like farm land ownership. It again directly and indirectly influences their education (e.g. early marriage), household income, livestock ownership, household labor and other related critical assets. These further add several back breaking tasks on them to satisfy the household demands. Thus it impinges them not to have time and other resource to participate in trainings, meetings and NRCTDC. Even though they do involve in such a cooperative, it is unlikely to actively participate in capacity building trainings and discussions.

In a nut's shell, most cooperative members did develop a negative attitude towards CMPFAs due to inter-related factors. Therefore, a proper understanding of stakeholder attitudes and the factors influencing it is imperative for cost-effective, successful and sustainable conservation and development endeavours. Especially it is an inevitable in a situation where members as well as stakeholders are required to wait long to rape their fair shares.

4.2 Recommendation

The NRCTDCs members operate and display tangible progress under frustrating and desperate situation. In order to reduce their obstruction on the PFA and their cooperatives' fate, it might be prudent to design complementary and efficient strategies. The designed strategies have to reduce the communities' dependence on the protected forest areas and the biodiversity. For these, expanding educational (formal, informal and non-formal) services must be a priority focus. In order to improve the literacy level of the local people, the cooperative members, it is highly recommended to establish a strong linkage among stakeholders of the CMPFAs. This will improve people's access to informal and non-formal trainings to get theoretical knowledge and practical skills. Applying the knowledge and practice will help them see a progress on their PFAs, upholding their tendency of developing a positive attitude towards CMPFAs. This further motivate and urge them see their ultimate goal, developing their PFA into a tourism site. However, the formal education, more specifically the elementary and junior, curriculum lacks a natural resource management component. Therefore, as a policy implication it is highly recommended to inculcate this issue to create a massive awareness on the public and improve the forest and biodiversity coverage of the nation at large, especially, in the areas of integrated watershed management.

It is wise to strengthen the linkage among actors of the PFA system to improve participation and transparency. Thus, they can share their specific roles and responsibilities that would enhance a continuous follow up and encourage actors' and members' participation. More specifically, the respective *weredas'* cooperative promotion offices need to at least consume one of the monthly meetings of the cooperative members to disclose the financial progress report. This paves a way to minimize members' suspicion towards the corruption of the cooperative resources. Such a transparent system for sure helps members to develop a positive attitude towards the CMPFAs.

Deep rooted and culture embedded gender issues need time to create awareness among the mass and to engage towards gender mainstreaming and further activities. Hence, it is very wise to design area specific legal frameworks that is capable of solving the existing challenges and that facilitate the realization of gender equity and finally gender equality. But, care must be taken for them not to contradict with the national gender legal framework. In the mean time providing trainings on gender issues and mainstreaming gender in such a NRCTD cooperative must be a priority to encourage full participation of women in CMPFAs.

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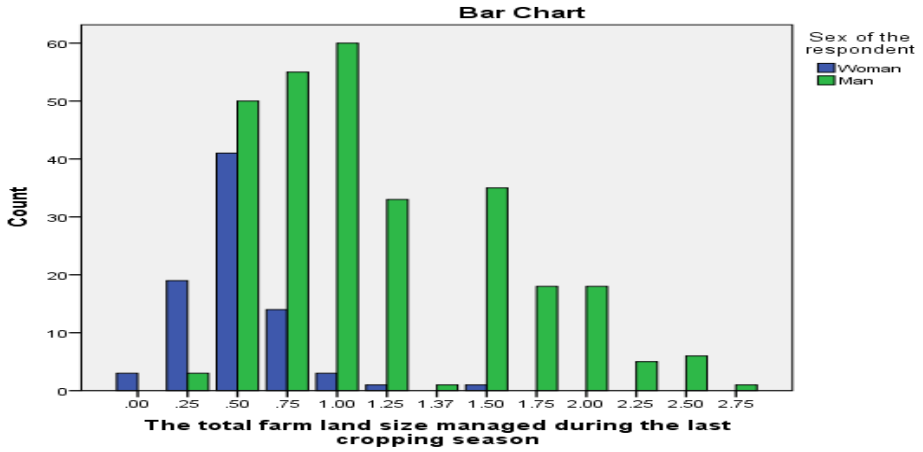
Appendices

Appendix 1. Gender differential on access to different benefits rendered for the NRCTDCs'

Variable	Dimension	Women(82)	Men (285)
Participation in Participatory Forest Management training(s)	Yes trained	25(30.5%)	121(42.5%)
	Not trained	57(69.5%)	164(57.5%)
Additional social role participation	Cooperative leader	5(6.1%)	49(17.2%)
	Kebele administrator	8(9.8%)	60(21.0%)
	No more social role	69(84.1%)	176(61.8%)
Participation in financial progress report meeting	Participated	25(30.5%)	121(42.5%)
	Not participated	57(69.5%)	164(57.5%)
Participationin additional income generating training(s)	Trained	17(20.7%)	127(44.6%)
	Untrained	65(79.3%)	158(55.4%)
Frequency of extension workers' visit	Seldom	64(78.0%)	34(11.9%)
	Regularly	18(22.0%)	137(48.1%)
	Most often	0(0%)	114(40.0%)
Participation in off/non-farm activities	**Participated**	**52(63.4%)**	**149(52.3%)**
	Not participated	30(36.6%)	136(47.7%)

Source: own data 2018



Appendix 2. Gender and own farm land holding size

Appendix 3. Literacy level and its differential treatment on access to different benefits

Variable	Dimension	Literate	Illiterate	Total
Participation in Participatory Forest Management training(s)	Trained	137(93.8%)	9 (6.2%)	146
	Untrained	107(48.4%)	114(51.6%)	221
Additional social role participation	Cooperative leader	50(92.6%)	4(7.4%)	54
	Kebele administrator	60(88.2%)	8(11.8%)	68
	No more social role	134(54.7%)	111(45.3%)	245
Participation in financial progress report meeting(s)	Participated	137(93.8%)	9(6.2%)	146
	Not participated	107(48.4%)	114(51.6%)	221
Participation in additional income generating training(s)	Trained	109(75.7%)	35(24.3%)	144
	Untrained	135(60.5%)	88(39.5%)	223
Frequency of extension workers' visit	Seldom	45(46.0%)	53(54.0%)	98
	Regularly	96(62.0%)	59(38.0%)	155
	Most often	103(90.4%)	11(9.6%)	114

Source: Own survey 2018