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Local Communities' Accountability for Natural Resource Conservation: a Comparative Study of Chiro and Fiche, Ethiopia

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Abstract
Ethiopia's natural resources base, its land, water, forests and trees are the foundation of any economic development, food security and other basic necessities of its people. Smallholder agriculture is the dominant sector that provides over 85 percent of the total employment and foreign exchange earnings and approximately above 45 percent of the GDP. However, natural resource degradation is a major concern for Ethiopia's poor rural communities. Post-modernism approach to natural resource management assumes that sustainability of specific natural resource conservation and management measures is at risk when local communities feel no ownership over the resources for the way it is used and managed. The main purpose of this study was, therefore, to assess conduciveness of factors for local communities' accountability for natural resource conservation in Chiro and Fiche area, Ethiopia. The research variables were economic benefits; right and access to natural resources; and knowledge and capacity to implement conservation activities. For comparison purpose, two successful and unsuccessful watershed developments were purposively chosen for this study. Data were collected using survey instrument from 304 head of households sample population in Fiche and Chiro areas within Ethiopia. Qualitative data were also collected through interview and document review. The study used descriptive statistics represented by frequencies and percentages. Chi-square test was also used to analyze whether or not significant variation existed between the sites. The results indicated high local communities' accountability for natural resource conservation in Chiro. Existence of economic benefits is a critical and an effective means to provide the incentive for feeling a sense of ownership by the local communities. Knowledge and capacity of carryingout conservation activity is equally vital for successful implementation of community based natural resource conservation. It is also possible to implement successful community based natural resource conservation under the existing rural land ownership system in Ethiopia.
Keywords: sense of ownership, local communities' accountability, natural resource conservation, watershed development

1. Introduction

The two approaches to natural resource management (NRM) are modernization and post-modernization (Pretty and Shah, 1997; Talbot, 1984). Modernization approach assumes that because local people are the cause for natural resources (NRs) degradations; the responsibility to conserveshould be vested on the state and its agencies. This approach excluded local people's participation in the planning for natural resource conservation. Most of the conservation efforts in modernization frameworks have not brought lasting effects though they have conveyed considerable success in the short run (Pretty and Shah, 1997; Talbot, 1984). As a response to this failure, post-modernization approach to NRM has been developed starting from the mid-1980s and mid1990s (Carney and Farrington, 1999). This approach argues that people know what is best for them. Hence, one has to listen to and actively seek after their voices to bring sustainable natural resource management (Pretty and Shah, 1997).

Scholar like Laban (2005) hasidentified factors such as institutional, social, economic and environmental domains that influence natural resource conservation at the community level. These factors determine the extent to which people can and will assume their part of the overall responsibility for managing natural resources(Laban, 2005).This sense of ownershipthat local people take for the way resources are managed in their community is related to two things: the degree that local people can assume accountability and the rights they have to natural resources(Laban, 2005). In this research accountability isused in a sense of "taking responsibility for one's own behavior and actions, at the same time being able to account for the effects of such behavior and actions to others" (Laban, 1994). Extensive experiences have shaped the idea of accountability in relation to natural resource conservations (Laban, 2005):community forestry program in West Africa; program of NGOs on sustainable land use in India; and a thematic review of eight long-term development programs in natural resource management funded by the Netherlands Government in Nepal, India, Pakistan, Nicaragua and Bolivia.These experiences revealed sustainability of specific natural resource conservation and management measures is at risk

when local communities feel no ownership over the resource and/or ownership for the way it is used and managed. Laban (2005) has developed analytical framework for local people's accountability for natural resource conservation and management.

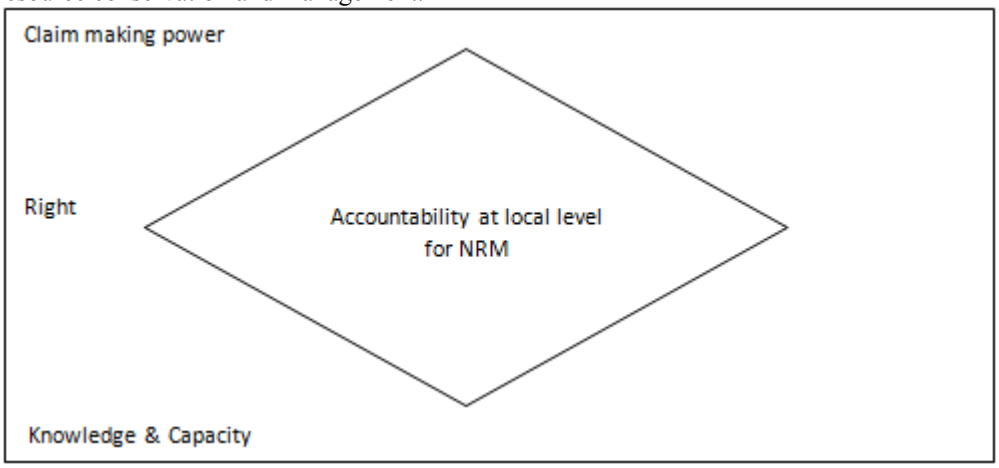

Figure 1: Proxies for local people's accountability for natural resource conservation

The above framework reveals that protection and management of natural resources have to take into account the multiple economic interests of local people ranging from religious to subsistence economic benefits. If these benefits are not vital, local people will refrain from investing time, effort and money in land use activities (Laban, 2005, 2000; Pimbert and pretty, 1995 and Berkes, 2004). Similarly,local people need to have the inner conviction that they are capable and have the right skills and means to carry out activities leading to sustainable management of natural resources. Furthermore, if local populations are in a state of uncertainty about their rights to natural resources, they no longer feel accountable for the protection and management of these resources in their land. Usufruct, access, control and ownership rights for individuals need to be made more explicit in formal legislation and regulations (Laban, 2005). Finally, local people are seldom homogeneous units; there are often multiple conflicting interests between different groups composing local communities. Organizing community leadership and strong and functional village groups with similar interests becomes a necessity to increase their claim making power and to confer sufficient autonomy and independence.

Identification of the pre-conditions and an analysis to check whether or not they are met may help to understand how such conditions can be improved. It will also highlight shortcomings in government policies and the need for lobbying to have them modified (Laban, 2005). This study has focused on three variables: economic benefits; right and accessto natural resources; and knowledge and capacity to implement conservation works. The purpose of this study,therefore, is to assess availability of these important factors for local communities' accountability for natural resource conservation.Section two of this study deals with the research design and methods of data collection and analysis. Section three discusses the findings of the study. The final section summarizes the findings and discusses their implication.

2. Research Design

2.1. Description of the study area

Chiro area is found in West Hararghe Zone, eastern part of Oromia National Regional State, more specifically in Doba District and Lencha Wadesa Village, , 250 to 350 kilometers east of the capital city Addis Ababa, some 300 kilometers south of Djibouti. The agro-climatic range includes lowland (30-40%), midland (35-45%) and highland areas (15-20%), with lowest elevations at around 1,000 meter above sea level, culminating at 3,405 meters, at the top of GaraMuleta Mountain. There are two rainy seasons, the small *belg* and the main *meher*. *Belg* production is limited within the highland zone and part of the wetter midland, but *belg* rains are widely used for land preparation and seeding of long cycle *meher* crops (sorghum & maize). Annual rainfall averages range from below 700 mm for the lower *kola/hot* to nearly 1,200 mm for the higher elevations of midland and highlandzones. The variability of rainfall from year to year and its often uneven distribution during the growing seasons give place to a wide range of climatic hazards which farmers have to deal with. The main staple food includes sorghum and maize, as well as sweet potato, which is extensively cultivated during bad years to improve food security. Other food crops include barley, wheat,*teff* and pulses. Cash crops like *chat* (a popular, mild narcotic) and coffee have a long standing tradition, complemented by Irish potatoes, onions and some other vegetables.

Fiche area is found in North Showa zone of Oromia Regional State, more specifically in Gerar Jerso District and Gishe Usmani and Illamu Villages.Fiche area is located in the central part ofthe country, some 120 kilometers from Addis Ababa. Like most part of Ethiopia, mixed farming dominates the livelihood of the area. Land is one

important asset of households for production of crops and rearing of livestock. The most commonly produced crops in the area are annual crops such as barely, wheat, teff, bean and maize.

2.2. Sampling design

Multiple number of community based watershed developments are being carried out by the local communities across Oromia Regional State. According to Agriculture Bureau of the region, some of the watershed developments were successful in their implementation as compared to others. Among the successful watershed developments are those which are found in West Hararghe, Chiro area, more specifically in Doba District, Lencha Wadesa Village. In this Village, there are two successful community based watershed developments, namely, "GaaraArguba" and "Gaara Dubayya". Among the unsuccessful watershed developments are those which are found in North Showa, Fiche area, more specifically in GerarJarso District, IllamuandGisheUsmani Villages. In this village, there are also two unsuccessful community based watershed developments, namely, Gaara qarchacha and gaara usmani. Hence, four watershed developments (two successful and two unsuccessful) were chosen partly on the base of judgment and partly on the base of convenience. Chiro area watershed developments were judgmentally sampled because of its good successful history in the conservation works; whereas Fiche area watershed developments were judgmentally and conveniently selected because of their poor successful history in the conservation works and its nearness. It is important and mandatory that the sample size be representative of the target population so that meaningful analysis and conclusion can be made. Accordingly, 304 household heads/farmers (152 from each study area) were randomly selected. The following Table 1 describes sample size distribution of the respondents.

Table 1. Sample Size

	Study area	Total household heads in each Village	Sample size (24%)
	Fiche	632	152
	Chiro	612	152
Total		1244	304

2.3. Method of data collection

Field survey was conducted from January to February 2014. The questionnaire was pre-tested by administering it to selected respondents. On the basis of results obtained from the pretest, necessary modifications were made on the questionnaire. Besides, key informant interviews were held with selected active community members and development workers.Some documents were also reviewed. These informal techniques helped to acquire useful and detailed information, which would have been difficult to collect through the questionnaire survey.

2. Results and Discussions

In this section demographic characteristics and the results of analytical findings are presented and discussed.

Table 2. Demographic Characteristics of the Respondents

		Chiro		**Fiche**	
		N	**%**	**N**	**%**
Gender	Male	105	69.1	124	81.6
	Female	47	30.9	28	18.4
Educational Level	Illiterate	34	22.4	76	50.0
	Primary education	86	56.6	71	46.7
	Secondary education & above	32	21.0	5	3.3

As indicated on Table 2, 229 or (75.3%) of the participants were males while 75or (24.7%) were females. In terms of gender distribution, majority of the participants in both sites were males (69.1% in Chiro and 81.6% in Fiche). The proportion of female participants in Chiro (30.9%) was a bit greater than Fiche female participants (18.4%). Regarding to educational level of the participants, there was variation in the two sites. This was evident that only 22.4% of Chiro's participants were illiterate while 50% of Fiche's participants were illiterates. The table also indicated that 56.6% of Chiro participants and 46.7% of Fiche participants completed primary education while 21% of Chiro and 3.3% of Fiche participants completed secondary education.

3.1. Findings

The range of questions asked wasorganized in such a way that the author sought answers in the following three broad indicators of communities' accountability for natural resource conservation.

1. *Economic benefits from the conservation activities*
2. *Rights and access tonatural resources*
3. *Skill and capacity to perform conservation activities*

The results of the survey, as they relate to each of these broad areas, are presented below.

Availability of Economic Benefits

Table 3. Economic Benefits from the Conservation Activities

Questions	Sites							
	Chiro				Fiche			
	Yes		No		Yes		No	
	N	%	N	%	N	%	N	%
Do you get forage and other benefits from the conservations activities that were undertaking?	120	78.9	32	21.1	14	9.2	138	90.8
Do you believe that there is equal benefit sharing among the community?	52	34.2	100	65.8	20	13.2	132	86.8

As indicated on Table3, participants were asked whether or notthey got forage yields and other benefits from the conservationactivities.According to the response there was strong variation in the two sites. This was evident that81.6% and 25.7% of participants in Chiro andFiche respectively got some benefits from theconservation activities. Among the immediate benefits obtained by the local communities in Chiro included grass and forages for their animals and house construction, fuel woods and pigeon pea. Considering the success of community based natural resource conservation in Chiro area, these findings support Laban's (2005) idea whichstates that if the economic benefits obtained from the conservation works are not visible, local people will refrain from investing time and energy.Regarding to equalityof benefits sharing from the communal watershed developmentsamong the local communities, only 34.2% and 13.2% of the participants in Chiro and Fiche respectively agreed thatthere was equitable benefits sharing (see Table 3 above).

Table 4: Expectation of Economic Benefit from Preserving Open Space

	Chiro		Fiche	
Agree	105	69.1%	47	31%
No comment	24	15.8%	48	31.6%
Disagree	23	15.2%	57	37.5%

As indicated on Table 4 above, participants were asked to indicate their agreement or disagreement with statement, "There are economic benefits from preserving open space". The result indicated that 105 (69.1%) of Chiro participants and only 57 (37.5%) of Fiche participants agreed with the statement. The high percentage in Chiro might be because of better awareness and knowledge onenvironmental resource conservation (see Table 6 and 7 and Figure 4). The concern of one of the keycommunity member on equality of benefits sharing among the local communities in Chiro was quotedas follow.

> *My name is Ahmed naji. Farmers in our village are highly contributing to watershed developments of the area (the author held an interview while the farmers were on the duty). Because of our efforts and commitments, the degraded mountains and watershed areas have been regenerated. Springs are now found in several places. Forests once disappeared, now days regenerated.Now we are capable to use different techniques of natural resource conservation. Even though private and immediate economic benefit from the communal conservation activities is currently limited, we (farmers) have been benefiting indirectly in multiple ways. However, there are some challenges concerning the distribution/sharing of different benefits to be generated from communal watershed developments. For instance, regarding the use of spring water, only farmers who have land tenure (usufruct right from the land) near to the river or spring have the right to use the water for irrigation. There are also no clear rules and regulations or consensus regarding distribution of benefits to be generated from the watershed areas that are owned by the government/Village Administration. Hence, for sustainable communal land conservations, the concerned bodiesshould develop the rules governing sharing of the benefits and expand to the rest of the communities in the area.*
>
> *Ahmed naji, December, 2013*

Existence of short term economic benefit in the community based natural resource conservation is vital in developing sense of ownership among the local communities from the program. This is because the amount of benefits expected (including its distribution) by the local communities in return of their efforts and energies determine the degree to which they will be accountability for their actions and behaviors. Therefore, the researcher concluded that existence of some economic benefits from the conservation activities is a critical and an effective means to provide the incentive for feeling a sense of ownership.

The following figure partially illustrates Wadesa community based watershed developments.

Figure 3. Wadesa (Chiro area) community based watershed developments partially
Source**:** author own field visit, 2014

Figure3 above shows aregenerated areaby the efforts and energies of Chiro area local communities. It indicates the revived natural resources products such as grass, trees and pigeon pea that could provide different immediate economic benefits to the local communities beyond and above restoring the general ecology and climatic condition of the area. Therefore, Chiro area local communities' high accountability for the conservation and management of their environmental resources could be considered as the best practices that can be benchmarked for the other places in the country including Fiche area.

Rights and Accessto the Natural Resource

Table 5.Ownership on Watershed Development Areas

Response	Site	O/%	E	O-E	$(O-E)^2$	$(O-E)^2/E^*$	Chi square	df	p-value
Agree	Chiro	80 52.7%	74	6	30.25	0.409	0.818	1	0.3658
	Fiche	68 44.8%	74	-6	30.25	0.409			
No comment	Chiro	38 25%	50.5	-12.5	144	2.851	5.703	1	0.0169
	Fiche	63 41.4%	50.5	12.5	144	2.851			
Disagree	Chiro	34 22.4%	27.5	6.5	36	1.309	2.618	1	0.1057
	Fiche	21 13.8%	27.5	-6.5	36	1.309			

O: observed frequency. E: expected frequency

Some scholars found that if local communities are in a state of uncertainty about their rights to natural resources, they no longer feel accountable for the protection and management of these resources in their land. Particularly Laban (2005) states that usufruct;access and ownership rights for individuals need to be made more explicit in formal legislation and regulations. In this regard, participants were asked to indicate their agreement or disagreement with statement, "Local people have ownership right over watershed development areas". As indicated on Table 5, nearly 53% and 45% of the participants in Chiro and Fiche respectively "agreed" to the statement. The p-value result indicated that there was no significant difference between the proportions of the participants who agreed to the statement in the two sites at 5% level of significant.To further clarify and support the quantitative response, documents (particularly the Ethiopian Constitution and rural land use legislation of Oromia Regional State) was reviewed. According to the constitution, in Ethiopia, land is owned by the state and the public. However, farmers havecertificate that authenticate usufruct right for unlimited time from specified size of the rural farm land. Therefore, in both sites, majorityof the farmers have usufruct and hence access right from the specified land size in the watershed areas.Indeed, since the stoppage of farm land distribution in the Oromia Regional State, several young farmers do not have such certificate and hence have no usufruct and access right. These farmers have access to the farm land only either through inheritance/gift from their families or through rent or both.Watershedsareas such as mountains and hill are owned by the Village Administration. Regarding to distribution of benefits to be derived from such areas, the researcher found no clear rules and regulations in both sites. In Chiro area, the existing practice was that the development committee, Village Administration and the experts together decide on an issues on a case bases.

Knowledge and Capacity of the Local Communities to Conserve Natural Resources

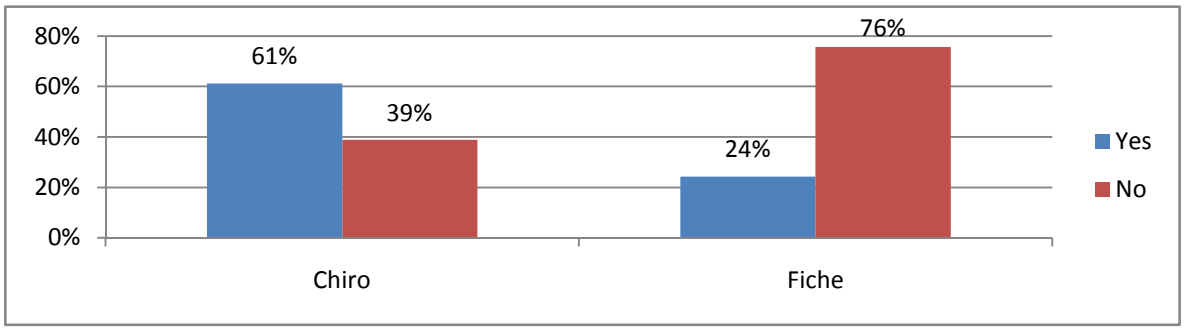

Figure 4. Response to Training Obtained by the Local Communities

As indicated in the introduction section of this study, local communities should have the inner confidence that they are competent and have the right skill and means to carryout activities leading to sustainable conservation and management of natural resources. In this regard, participants were asked with the statement,"Have you got training related to watershed development/natural resource conservation?" Figure 4 indicates that there was significant variation in the two sites. This was evident that 61% and 24% of participants in Chiro and Fiche have got training on NRs conservation. The p-value resultalso indicated extremely significant difference inthe two sites. From the qualitative data collect through interview, the researcher found that in Chiro most of the local communities have taken training, awarenesscreation and experience several times both by the government experts and Merit Project NGO working there on community based watershed developments for three years. However, interview data obtained from Fiche indicate that only a few people have got experience sharing with some farmers who came from Chiro area. District Administration and experts at the Village level provide general orientation/awareness creation on watershed developments once in a year before mass mobilization to the conservation. It was usually a top down approach of communication to the local people. This might be one of the possible reasons why application of soil conservation techniques in Fiche area was not improved in the area (see Table 6 below).

Table 6: Application of Soil Conservation Techniques

	Chiro		Fiche	
Agree	107	70.4%	57	37.5%
No comment	40	26.3%	90	59.2%
Disagree	5	3.3%	5	3.3%

As indicated on Table 7, 70.4% and 37.5% of the participants in Chiro and Fiche respectively agreed that their application of soil conservation techniques was improved since watershed development was started. Surprisingly, more than half of Fiche area participants (59.2%) neither agree nor disagree to the statement. This high percentage indicates that the knowledge/awareness of the local people in Fiche was very low.

Table 7. New Skills and Knowledge from the Program

Response	Site	O	E	O-E	$(O-E)^2$	$(O-E)^2/E^*$	Chi square	df	p-value
Agree	Chiro	72 47.4%	60.5	11.5	121	2	4	1	0.0455
	Fiche	49 32.2%	60.5	-11.5	121	2			
No comment	Chiro	41 27%	57.5	-16.5	256	4.452	8.904	1	0.0028
	Fiche	74 48.7%	57.5	16.5	256	4.452			
Disagree	Chiro	39 25.6%	34	5	20.25	0.596	1.191	1	0.2751
	Fiche	29 19.1%	34	-5	20.25	0.596			

O: observed frequency. E: expected frequency

The participants were asked with the statement "'the program provided me the opportunity to learn new skill and gain knowledge from experts". As depicted on Table 7, 47.4% and 32.2% of the participants in Chiro's and Fiche respectively responded "agrees" to the statement. P-value result also indicated that the variation in the two sites was significant at 5% of probability. Nearly 49% of the participants in Fiche did not know.

4. Conclusion and implications

This research was a comparative study of local communities' accountability for natural resource conservations in two sites, Chiro and Fiche.The research variables were economic benefits from the conservation activities; right and access to natural resources; and knowledge and capacity to carryoutnatural resource conservations. The result indicated variations in the two sites.Unlike Fiche communities, large number of Chiro communities has got some immediate economic benefits from the undergoing conservation activities.Theeconomic benefits obtained by the local communities in Chiro included grass and forages for their animals and house construction, fuel woods and pigeon pea.Fiche area local communities, who have got no/very limited direct economic benefits, did not have knowledge and skill to carryout natural resource conservation. Regarding to the right and access to natural resource conservation, there was no significant difference in the two studies. Unlike Fiche, Chiro area participants' application of different natural resource conservation techniques has significantly improved since watershed development started in the area. This area local community has also acquired new knowledge and skill from the community based watershed development program.

This study has implications for sustainable natural resource conservation and management interventions.One implication was that short term direct economic benefitsfrom the community based natural resource conservation intervention is vital in feeling a sense of ownership among the local communities. This is due to the fact that the amount of benefits expected by the local communities in return of their efforts and energies determines the degree to which they will be accountability for their actions and behaviors. Hence, these economic benefits arethe criticaland effective means to provide the incentive for feeling a sense of ownership.

Another implication of this study was that knowledge and capacitytocarryout conservation activity is vital in bringing self-confidence and sense of ownership local communities. Hence, genuine and relevant training, awareness creation and experience sharing isequally vital.

Furthermore, considering Chiro area local communities' high accountability for the conservation and management of their environmental resources, it is possible to bring successful community based natural resource conservation under the existing rural farm land ownership system of the country.

Finally, this study has implication for future research. Further research is important to assess and develop a system by which equitablebenefit sharing from the watershed developments is possible to expand the benefits to morelocal communities of the area.

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