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Local People's Attitude and the Impact of Community-based Conservation Practice at Menz-Guassa Community Conservation Area, Ethiopia

Getachew Mamo Tilaye Wube*
Department of Zoological Sciences, College of Natural and Computational Sciences, Addis Ababa University, PO box 1176, Addis Ababa, Ethiopia

Abstract
A study on local people's attitude and the impact of community-based conservation system at Menz-Guassa Community Conservation Area (MGCCA), Ethiopia, was conducted using questionnaire survey, in-depth and key informant interview methods. All of the respondents practiced mixed farming as their primary source of livelihood and few (17%) were engaged in off-farming activities. The majority (93.8%) reported annual grain production of <10 quintals while the remaining had 15-20 quintals. All of the respondents expressed positive attitude towards conservation of MGCCA. Most of the respondents obtained benefits from the area such as animal fodder, firewood, water for livestock and irrigation. The data obtained from in-depth and key informant interviews showed the major role of governmental and nongovernmental organizations were to create awareness about the importance of the natural vegetation in Guassa and offer alternative income sources such as horticulture, apiculture, handcrafts manufacturing and marketing, energy saving stove production, guarding, and tourist services. The respondents also pointed out that the major challenges faced at MGCCA were human population increase, intermittent drought, and poverty. The conservation system at MGCCA appears to have a positive impact on the conservation and sustainable use of the local resources and it should be further strengthened.
Keywords: conservation, CBNRM, natural resources, Guassa, local people, attitude

1. Introduction

Natural resource degradation is a worldwide environmental problem which calls for serious attention from concerned bodies at individual, community and governmental levels (Stringer 2008). Resource over-exploitation and inappropriate land use such as over-grazing, deforestation, expansion of agriculture, grazing into marginal lands and backward agricultural practices were considered to have major negative impacts on biodiversity resources (FAO 1988; Nana-Sinkam 1995; FRA 2005).

Ethiopia has a wealth of natural resources on which the livelihoods of its people largely depend on. The survival of 85% of the human and 75% of the livestock population directly depend on these natural resources. However, local communities have been unsustainably exploiting the natural resources mainly due to poor agricultural practices and land management (Hurni, 1993). This has resulted in rapid deforestation, severe soil erosion and alarming environmental degradation throughout the country (Hurni 1993; EFAP 1994; Tamene *et al.* 2006; Nyssen, *et al.* 2009).

Menz-Guassa is one of the biodiversity hot spots of Ethiopia, which is home for various animal and plant species (Kingdon 1991). Out of the total 926 species of birds in the country, 114 occur in the area, of which 14 are endemic (Tefera and Leader-Williams 2005). There are also 18 species of mammals with seven endemic (Admassu & Tefera 2011; Simeneh 2010).

The Ethiopian Government has been taking different measures such as policy interventions, conducting surveys, and ensuring community participation to protect and conserve the Menz-Guassa area after realizing that biodiversity can be conserved by supporting the livelihoods of the local people through establishing Community Based Natural Resource Management (CBNRM). Community-based natural resource conservation has an advantage in natural resource conservation because it helps to create positive ties between the local people and their land through customary laws, complex religious ceremonies, symbolic activities, etc (Galudra 2005). Thus, CBNRM is considered as an effective approach towards sustainable natural resource conservation and management.

Over the last 400 years, the Menz-Guassa people conserved natural resources without outside assistance. At that moment, the Menz-Guassa community developed its own management system known as *Yekero Siriat* or *Qero* system. The system was headed by selected leaders called *Aba Qero* (Father of *Qero)*, who were responsible for protecting and regulating use of the Guassa natural resources. According to *Yekero Siriat*, any natural resource found in Menz-Guassa was tended for three to five consecutive years before it is used. The *Aba Qeros* determine when the area should be opened for grazing once they feel that the *Guassa* grass (*Festuca* sp.) is well grown and recovered. Usually, the pasture is left open between mid April and mid July. Outside of this period, the pasture is patrolled and guarded by assigned members of the community (Tefera 2005; Simeneh 2010;

Admassu & Tefera 2011). Now, the community conservation system is accredited by the Amhara National Regional State as the "Menz-Guassa Community Conservation Area (MGCCA)" under the proclamation number 97/2012.

The present study was an attempt to assess and evaluate the local people's attitude on the community conservation program existing at MGCCA and its impact on the local natural resources using questionnaire survey, in-depth and key informant interview methods.

2. Materials and methods

2.1. Study area

Menz-Guassa Community Conservation Area (MGCCA), also known as Guassa Park, is located in the central highlands of Ethiopia, North Shoa Zone of Amhara National Regional State, about 265 km from Addis Ababa (Fig 1). The geographic coordinates are10˚15'-10˚27'N and 39˚45'–39˚49′E; altitude 3200 m - 3700 m a.s.l. The total area of MGCCA is 78 km^2 (Admassu & Tefera 2011).

The total population of Menz Gera Medir District (to which MGCCA is part of) is 112,662, of which 55,077 are males and 57,585 females (ARGCC 2016). Crop farming and livestock husbandry are the main sources of livelihood. Festuca grass, locally known as *Guassa,* from which the area got its name, is sold in the nearby markets to be used for thatching house roofs, provides an additional income to the Guassa community, and this is particularly important to supplement the low income during drought seasons (Tefera 2001).

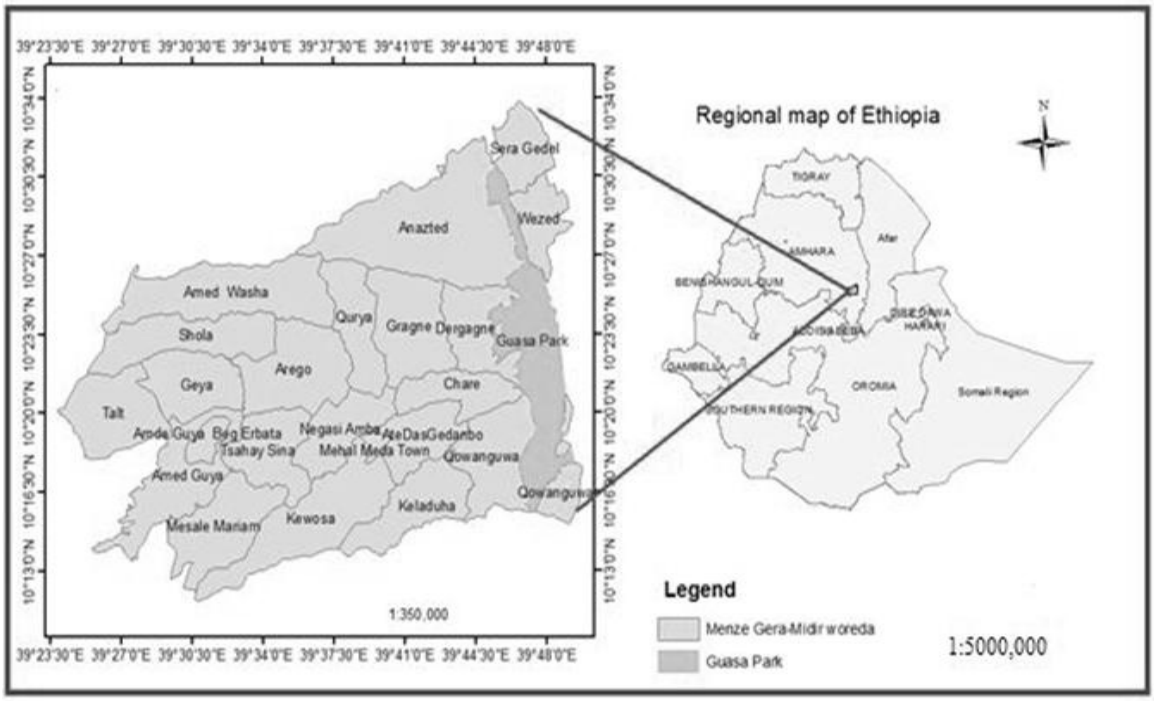

Figure 1. Location map of MGCCA within Menz Gera Mider Woreda (boundary in dark shed) (Source: Frankfurt Zoological Society)

The wet season at MGCCA is characterized by a combination of high rainfall, frequent hailstorms, and occasional snow while frosts are common during the dry season (Tefera 2001; Beyene 2010; Simeneh 2010). Rainfall is bimodal: June – September is the main rainy season while February- April receives small rain. The annual rainfall ranges between 1200-1600 mm (Tefera 2001; Beyene 2010). Mild day temperature and cold night temperature characterize the area. During the dry seasons (December - January), the temperature would rise up to 21˚C at daytime, but it falls to -7˚C at night. In the wet season, the daytime temperature is around 12˚C while the night temperature is 3˚C (Tefera 2001; Beyene 2010). The annual humidity ranges from 55.18% to 80.90% (Beyene 2010).

The vegetation at MGCCA is the Afro-mountain vegetation type dominated by Euryops-alchemila shrub land and Erica moorland. Common plant species found in the area include, *Festuca sp*. *Carex monostachya*, *Carex fischeri*, *Hydrocotyle mannie* and *Kniphofia foliosa.* The shrub vegetation of *Euryops inifolius* is extensively used as firewood by the communities living adjacent to the MGCCA (Admassu & Tefera 2011).

2.2. Methods

2.2.1. Questionnaire

A total of 160 (140 male and 20 female) respondents were randomly selected from households in the five Kebeles (smallest administration units) in the area for questionnaire survey. The questionnaire addressed topics on socioeconomic background of respondents, their attitude towards the community-based conservation practices, the challenges faced, and their recommendations on the future management of the area. Most of the respondents were males (87%), married (96%), with educational background of primary education or literacy (68%), and 41-50 years old (53%).

2.2.2. In-depth interview

In-depth interview is one of the principal qualitative research methods used to probe information from a small number of informants to explore their viewpoint on a particular situation (Boyce & Neale 2006). For this study, extended one-to-one interviews were conducted with 25 informants who were selected through convenient sampling to document information on the advantages of community conservation at MGCCA, major challenges faced, and any negative impacts of the community conservation practice.

2.2.3. Key-informant interview

Key-informants are knowledgeable persons with firsthand information about the issue under study (Kumar 2011). Accordingly, nine key-informants from community elders, government offices, and the Frankfurt Zoological Society that is running support programs at MGCCA were interviewed on the major objectives of the community conservation program and its role in biodiversity conversation.

This study did not involve experimental tests which can affect the health of participants nor it solicited a private and personal information about the participants. Thus, ethical clearance was not required to conduct the study except the consent of participants.

3. RESULTS

3.1. Livelihood of the respondents

The main source of livelihood of all of the respondents was mixed farming i.e. a combination of crop farming and livestock keeping. Some of the respondents practiced off-farm activities besides mixed farming to supplement their low incomes. Of these, 13% (n=21) were engaged in production and selling of home garden vegetables and dairy products; 4.4% (n=7) worked in the local grind mill plants and sold local drinks including alcoholic drinks like *Tela* (local beer), *Arekie* (local spirit), and tea; 1.25% (n=2) were employed as guards of the Guassa grassland; 2.5% (n=4) had to depend on pension and safety net programs.

3.2. Crop production

Less than 10% of the respondents reported annual crop production of 10-20 quintals while the majority (68%) had annual production of ≤ 5 quintals (Fig 2).

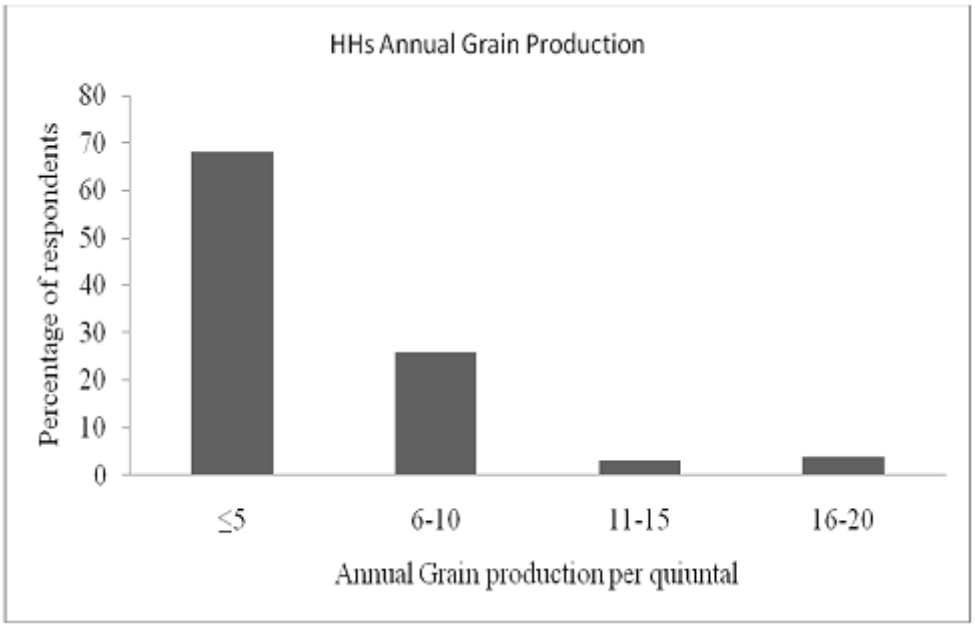

Figure 2. Annual crop production of respondents at MGCCA

3.3. Livestock husbandry

Livestock husbandry was the other major economic activity of the community in the study area next to crop production. The major types of livestock around MGCCA were cattle, sheep, donkey, horses, and mule. The communities rear sheep for two purposes. First, sheep can be used as source of meat or cash. Secondly, the wool of the sheep is used for weaving traditional blankets locally named as *Zitet* and *Bana* for protection against the severe cold that is common in the area. The majority (96.25%) of respondents had ≤10 cattle, and 87.5% of them had 10-30 sheep while all of the respondents had at least one or two pack animals (Table 1). The number of livestock owned by the participants was higher in the past. However, they were advised by the agricultural extension workers to decrease the number of domestic animals to the carrying capacity of the available pasture and to focus on the quality of their animal products rather than quantity.

Table 1. Livestock ownership of the respondents at MGCCA

No	Livestock	Number of livestock	Number of respondents (%)
1	Cattle	≤ 10	154 (96.25)
		10-20	6 (3.75)
		≤10	20 (12.5
2	Sheep	10-20	85 (53.13)
		21-30	55 (34.37)
3	Pack animals (donkey and mule)	≤ 2	160 (100)

3.4. Source of forage for livestock

Source of forage was one of the most challenging problems in the conservation of MGCCA. This was reported as the significant factor that constrained the surrounding community from fully supporting the conservation system because of the restricted access to the Guassa grazing pasture. The majority of respondents (65.6%) had reported that they own ≤ 1 hectare of grazing land and nearly 72 % of them reported their grazing land does not adequately support their cattle. As a result, 65 % were forced to buy cattle forage from other farmers while 28% believed reducing the number of their livestock was the solution (Table 2).

Table 2. Size of grazing land and attitude of the respondents on forage availability

No	Questions on forage	Options	Number of Respondents (%)
1	Size of your grazing land in hectares?	≤1hectare	105 (65.6)
		1-5	55 (34.4)
2	Is the available forage sufficient?	Yes	45 (28.1)
		No	115 (71.9)
3	How do you solve problems of forage shortage?	Buying from other farmers	105 (65.65)
		Economical use of available forage	9 (5.6)
		Reducing number of livestock	46 (28.75)

3.5. *Attitude towards the community- based conservation at MGCCA*

All of the respondents reported that conserving the natural resources of MGCCA was very important. Also, most of them (82.5%) have direct participation in the conservation activities of MGCCA. However, the majority of respondents (88.75%) felt they have lost benefits due to the restrictions imposed as part of the conservation action. Some respondents (23.75%) reported the existence of human-wildlife conflict due to crop raiding and livestock depredation.

3.6. Benefits Obtained by the Local People from MGCCA

The in-depth interview revealed that the conservation system at MGCCA gave the local people both direct and indirect benefits. These benefits included; non-consumptive benefits in the form of protection of natural heritage, wildlife protection and development of tourist attractions, development of water catchments, keeping the aesthetic value of the area and increased precipitation, financial gain from ecotourism activities such as mule renting and catering for tourists. However, participants in the in-depth interview expressed deep dissatisfaction in the current conservation system since it totally prohibits grazing in the protected zone of MGCCA.

3.7. Respondents' preference on future management approaches of MGCCA

The majority of respondents (56%) prefer community-based management with some improvement of the existing laws while only few (5%) suggested return to the traditional *Qero* system that was practiced several hundred years back (Table 3).

Table 3. Preference of the local people on the future management of MGCCA

No	Preference	Number of respondents (%)
1	Community-based management with revised laws	90 (56.25)
2	Both state and community management	46 (28.75)
3	State management	15 (9.4)
4	*Qero* system	9 (5.6)

3.8. Role of the local administration

According to the key-informants from the local Agricultural Office, the Office has been working towards rehabilitation of the degraded land through forest conservation, basin development (example Godebe basin) and afforestation. The Office also encouraged the farmers to plant cattle feed in their backyards, and advised them to reduce their livestock to the carrying capacity of their grazing land. The farmers were also provided with loans to buy fodder from neighboring areas during periods of drought. The Office organized awareness creation programs on conservation and sustainable use of natural resources. The awareness creation programs helped to bring about attitudinal changes that have reinforced the positive participation of the local community in the conservation of MGCCA. According to the key-informants, although the community understands the importance of conserving MGCCA and the role of CBNRM, rapid population growth, and poverty are posing serious challenges to manage the natural resources of MGCCA sustainably. Rapid population growth negatively affects MGCCA through the increased demand for agricultural and settlement land. Key-informants from the Culture and Tourism Office revealed that the Office conducted various promotion activities on the MGCCA heritage, including traditional costumes, topographic features and sceneries, and local handcrafts. In collaboration with Frankfurt Zoological Society, the Culture and Tourism Office conducted capacity building training on alternative income generation and energy saving that included, production of energy saving stoves, marketing horticulture and apiculture products. This helped to create new job opportunities for 26% of the people in the local community. Due to the promotion of the tourist attractions of MGCCA, the number of tourists and tourism-based income increased steadily. The income was mainly generated through catering services, guarding and security, and renting of pack animals for transportation. The tourism-based income increased from less than 50,000 Birr in 2009 to almost 700,000 Birr in 2016 (1USD = 27.3 ETB) (Fig 3).

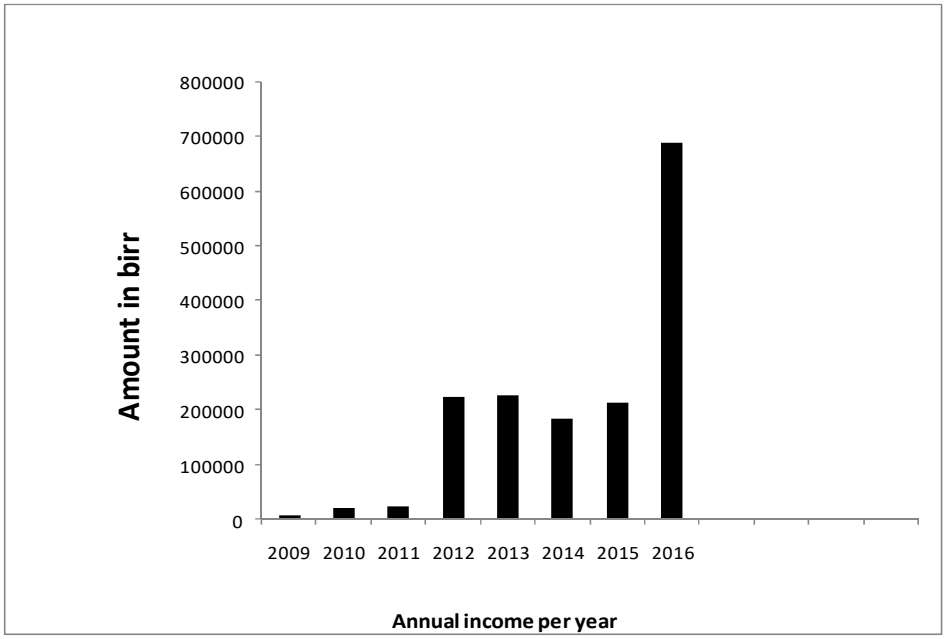

Figure 3. Annual income generated from tourism-based activities at MGCCA (Source: Culture and Tourism Office Annual Report, 2016)

3.9. Role of NGO

Frankfurt Zoological Society (FZS) was the sole NGO that has been contributing for the conservation and community support of MGCCA in recent years. Its primary target was saving the unique afro-alpine habitat and rehabilitation of the degraded mountains of MGCCA. It also ran projects that support the traditional conservation practices based on community participation. The Society started its program in Ethiopia in 2009 focusing on conservation of the iconic Ethiopian Wolf which is also found in MGCCA. The Society also helped in preparing the draft document of the current MGCCA conservation regulations and actions. Uniforms, boots and torch

lights were provided by the Society to volunteers participating in the conservation program as guards. To mitigate the problem of over exploitation of the natural resources, households who have been repeatedly involved in illegal activities in the area, and marginalized landless households were selected for a threat reduction and compatible livelihood opportunities and activities. These selected groups of the community (n=797) were supported by the Society to start apiculture, highland fruit production, livestock fodder production, fuel-efficient stove production, tourist guiding and scouting jobs (Table 4).

Table 4. Community support in alternative livelihood development by Frankfurt Zoological Society (Source: Annual Report of FZS, 2016)

No	Alternative livelihood	Number of beneficiaries
1	Apple farming	100
2	Apiculture	180
3	Energy saving stoves	200
4	Livestock fodder production	200
5	Handcraft businesses	85
6	Community scouts	32
	Total	**797**

According to the key-informants of FZS, the living conditions of the local community improved significantly due to the support. For instance, the beekeepers earned between 12,500 – 30,000 Birr annually whereas the annual income of most of these people was not more than 8,000 Birr before the support program. The informants also revealed that, illegal utilization of natural resources and grazing in MGCCA were significantly reduced (Fig 4). Thus, the project interventions have been crucial and helpful not only to alleviate poverty but also towards natural resource conservation. The community support project by FZS has phased out in July, 2017.

3.10. Impact of the community-based conservation on wildlife

A census data on the different wildlife populations collected by the Guassa Community Council indicated that the population size of the major wildlife species has substantially increased between 2009 and 2016. This increase was attributed to the community-based conservation practice at MGCCA (Table 5).

Table 5. Changes in population size of the major mammal species at MGCCA (2009-2016) (Source: Guassa Community Council Annual Report, 2016)

No	Common name	Species name	Population estimate	
			2009	**2016**
1	Ethiopian wolf	*Canis simensis*	5	59
2	Grey duiker	*Sylicapra grimmia*	6	22
3	Rock hyrax	*Procavia capensis*	14	214
4	Gelada baboon	*Theropithecus gelada*	461	1774
5	Klipspringer	*Oreotragus oreotragus*	12	45
6	African wild dog	*Lycano pictus*	6	41
7	Leopard	*Panthera pardus*	0	5

4. Discussion

The majority of the sampled respondents had low annual grain production. This may be due to poor soil quality resulting from erosion and over-cultivation, and shortage of rain. The annual crop production which is about one quintal per head is not sufficient to fulfill the basic diet requirements. At the current market, the price of one-quintal barley or wheat is US 26.00 – 32.00 which is less than one cent per day. That is why the communities around the MGCCA illegally cut the *Guassa* grass and generate additional income to secure their food requirements. The decline of soil fertility in the highlands of Ethiopia resulted in annual loss of grain production. An estimated 40,000 tons of grain is potentially lost annually due to land degradation (Bekele 2001). According to Tadesse (2001), about 1.5 billion tons of top soil is lost from the Ethiopian highlands by erosion resulting in the reduction of the annual crop production to an estimated 1.5 million tons which amounts to 12.5% of the total annual national crop production.

In Ethiopia, the total cattle population is estimated to be around 53.4 million. At the national level, most households (about 53.21%) have one to four cattle, 20-27% of households have five to nine cattle, and 20-24% have no cattle altogether (CSA 2010). Compared to the national average, the farmers at MGCCA have higher numbers.

The prevalence of positive attitude towards the community-based conservation at MGCCA could have resulted from a sense of ownership of the natural resources. Similar findings were documented in Omotic Ari

people in south Ethiopia where the local people conserved the biodiversity by enhancing production of the staple food Enset (*Ensete ventricosum*) through traditionally instituted belief systems (Awimbo *et al.* 2004). Similarly, the household heads of Waye Peasant Association in North Shoa, Ethiopia, prepared local forest strategy towards development of positive attitudes for CBNRM and more successful biodiversity conservation (Awimbo *et al.* 2004). Success stories of CBNRM are also reported elsewhere. In Namibia, protected natural resources cover more than 14% of the total landmass of the country. An estimated 200,000 people participate in community-based conservation programs and earn up to US 2.5 million per annum. In Tanzania, more than 3.6 million hectares of forests and woodlands are now managed as village land forest reserves, entirely under the control of local communities (Awimbo *et al.* 2004). Moreover, absence of popular participation in resource managements has resulted in rejection of governmental policies (Tedila & Kile, 1998). Local people who lived close to the Guassa area have positive attitude towards the conservation area than those who lived far away (Tefera 2005).

5. Conclusion

Although the community understands the importance of conserving the MGCCA and the role of CBNRM, rapid population growth and poverty are becoming strong challenges to manage the natural resources of MGCCA sustainably. Rapid population growth resulted in degradation of natural resources through increased demand for land due to expansion of agriculture and settlements. Extreme drought occurred in many parts of Ethiopia and the natural hazards are also factors affecting survival, as the unpredictable rain limits the production of both food and cash crops (Oxfam Ethiopia 2010). Thus, poverty and drought are among the major challenges in MGCCA. We recommend for further strengthening of the existing CBNRM at MGCCA with continued support from governmental and non-governmental organizations to address challenges on the livelihood of the people primarily on poverty reduction and availability of animal feed.

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