



Amhara National Regional State Bureau of Culture, Tourism and Parks Development

In collaboration with
**Organization for Rehabilitation and
Development in Amhara**

**Socioeconomic Situation, Tourism Potentials And
Biodiversities Study Report for Mount Guna
Proposed Community Conservation Area**



**Wild Life Study, Development, protection
and Utilization Process**

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Acronyms

asl	above sea level
ALNP	Alatish National Park
BoCTPD	Bureau of Culture, Tourism and Parks development
BoEPLAU	Bureau of Environmental Protection, Land Administration and Land use
CSA	Central Statistics Agency
CT	Culture and Tourism
EBA	Endemic Bird Area
EPLAU	Environmental Protection, Land Administration and Land use
EFAP	Ethiopian Forest Action Programme
EHRS	Ethiopian High Land Reclamation Strategy
EPRDF	Ethiopian People's Revolutionary Democratic Front
EWNHS	Ethiopian Wildlife and Natural History Society
EWCP	Ethiopian Wolf Conservation Programme
IBA	Important Bird Area
IUCN	International Union for Conservation of Nature
ORDA	Organizations for Rehabilitation and Development in Amhara
TLU	Tropical Livestock Unit

1. Introduction

Ethiopia has 4 biomes (Afro Tropical Highland, Somali-Masai, Sudan-Guinean Savannah and Sahelian Transition); vegetation based 10 broad ecosystems, 32 agro-ecological zones, 69 Important Bird Areas (IBAs) and 2 hotspots (Horn of Africa Hotspots and Eastern Afro-montane Hotspot) with several biodiversity centers, ecological communities and sub agro-ecologies (Abraham Marye, 2010). The main part of the eastern Afromontane biodiversity hotspot is made up of the three ancient mountain massifs including the Ethiopian Highlands. The Ethiopian highlands are the home of 5200 species of plants of which 555 are endemic. They are also host 680 species of birds among which 31 are endemic to both Ethiopia and Eretria. Moreover, more than 30 of the nearly 200 mammals found in Ethiopian highlands are found nowhere else (Conservation International, 2012).

Among the seven mountain ranges which are the home of Ethiopian wolf, five of them are found in the Amhara region at North Gondar, South Gondar, South Wollo, North Wollo and North Showa Zones. The Region has about 637 species of birds (12 are endemic), 50 species of mammals (17 are endemic) and variety of fish, reptiles, amphibians and large number of plant species which require detail studies to quantify (Abraham Marye, 2010). The region has 5 legally declared parks, 16 priority forest reserves, 1 community conservation area (Menze Guassa), 3 water basins (Abay, Tekeze and Awash) and 58 major rivers and 5 lakes including the largest highland lake (Tana).

Mount Guna, located in South Gondar zone, is known to be the home of nationally and globally important biodiversities and the source of many rivers that drain to the two basins (Abay, Tekeze and LakeTana sub basin). Therefore, conserving this hotspot area both for biodiversity and ground water protection should be given due attention to take conservation actions.

Hence, this study was done in collaboration with ORDA and other stake holders to develop an understanding of the existing community management and status of an Afroalpine and Sub-afroalpine ecosystems of mount Guna and its environs.

As a result the biodiversity, cultural and historical resources and their management system; the socioeconomic situation and livelihood condition of the community; and possible conservation and rehabilitation strategies to delineate the area; major activities to be accomplished; roles and responsibilities of Stake holders are analyzed and discussed in the study report in a way to help the

decision makers to reach on consensus to bring mount Guna and its environs to community conservation area.

2. Rationale of the study

Mount Guna, being one of the seven mountain ranges, currently it is under human induced threats from agricultural expansion, livestock overstocking, over harvesting of natural resources and settlement like other mountains in the country. In order to conserve its naturalness and ecosystem representativeness; develop and utilize its resources sustainably, mount Guna and its environs must be brought to community conservation area system. This helps to increase the representative ecosystems of the region from its present status 2% and help to achieve one among the seven protected areas planned in the 5-year strategic plan.

3. Objectives of the study

The general objective of this study is to generate baseline data concerning natural, cultural and historical resources and the socioeconomic situations of the Afroalpine and Sub-afroalpine ecosystems of Mount Guna and its environs that ultimately helps in bringing the area to Community conservation system.

3.1. Specific objects

The specific objectives are to

- Identify and evaluate the biodiversity, cultural and historical resources and their management system of Mount Guna Afroalpine ecosystem.
- Assess and evaluate the socioeconomic situation and livelihood condition of the community living in and near Mount Guna Afroalpine ecosystem.
- Formulate possible conservation and rehabilitation strategies to delineate the area in to Core, Buffer and Transition zones.
- Identify major activities to be accomplished, roles and responsibilities of Stake holders to bring the Afroalpine and Sub-afroalpine ecosystems of Mount Guna as a Community conservation area.

4. Description of the study area

4.1. Location and Topography

The Sub afroalpine and Afroalpine ecosystems of mount Guna are found in south Gondar zone at a distance of 20km from Debre Tabor town in the south eastern direction and at a distance of 30km from Nefas mewcha town in the western direction. Moreover the area is found along Woldiya-Woreta Asphalt road, 129km from Bahir Dar and 699 from Addis Ababa. Currently, a new gravel road from Gassay to Wegeda (Simada woreda) and Mekane Eyesu (Misrak Estie woreda) that pass in and near mount Guna is being under construction. The elevation in the area varies from about 3200m at the base to 4113m at the peak of the mountain.

The area is found within three woredas: Farta in the northern and western directions, Laygaint in the Southern and South Eastern directions and Eastern Estie in the Western and South Western directions. It shares common borders with a total of 10 kebeles, out of which 3 are from Farta woreda (Soras, Moksh, and Arga), 3 from Lay Gaint woreda (Titira, Akabitand Guna gedeba) and 4 from Misrak Estie woreda. Still another 6 kebeles from the two woredas (Farta and LayGaint, 3 from each) have significant influence on the resources of the area.

According to reports by EWCP, the Afroalpine and Sub-afroalpine ecosystems of Mount Guna and its environs has 11000 and 4000 hectares of land above 3400m and 3800m asl. However, according to our reports the total area of the Afroalpine and Sub-afroalpine ecosystems of Mount Guna 5430 hectares (above 3600 m asl) located approximately between 11°36'06.07" and 11°49'48.59" N Latitude and 38°03'13.81" and 38°24'18.79"E Longitude (Fig. 1). This Afroalpine and Sub-afroalpine ecosystems is well known to be the source of many rivers that drain to the south western (Estern Estie), Tekeze (Laygaint) and Lake Tana (Farta) growth corridors of the region. This forms the divide between drainage basins of Abay and Tekeze rivers.

4.2. Climate and Agro-ecology

The Mount Guna ranges are marked by moist agro-climatic zones that are locally known as moist “Dega” and “Wurch”. Rainfall data for Guna massif is not available. However, the data from nearby towns, Debre Tabor and Nefas mewcha meteorological stations confirmed the area has bimodal rainfall seasons the mean annual rainfall being around 1068.45 mm.

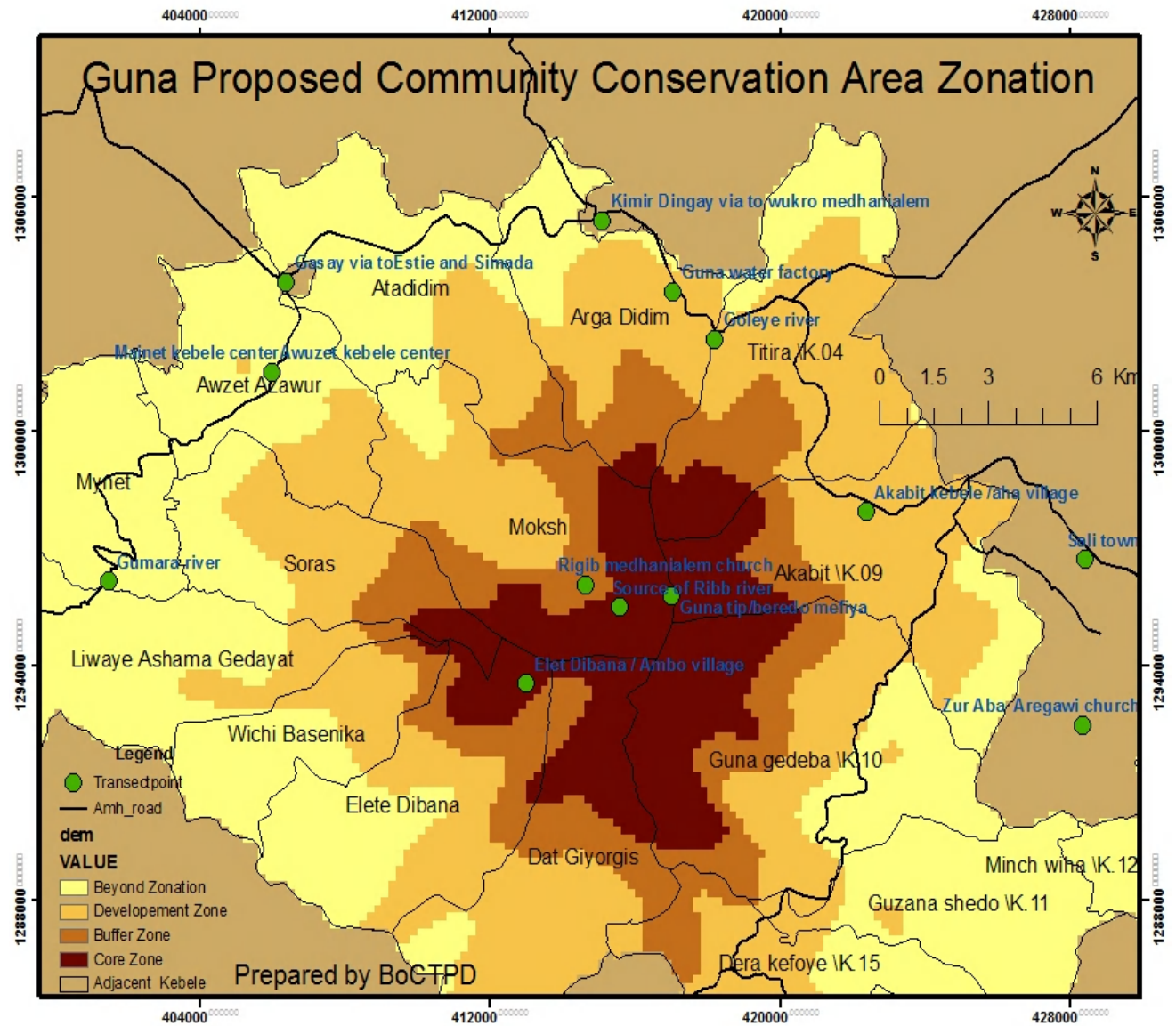


Fig. 1. Map of mount Guna Proposed Community Conservation Area

The lower rainfall occurs from March to May and the highest rainfall occurs in the summer season from June to September while the dry season ranges from October to February. The average annual temperature for Debre Tabor is 15.6°C whereas it is 13°C for Nefas mewcha station (Adise Mekonnen, 2006). Mount Guna massif is characterized by inadequate vegetation except the mountain grassland habitat where it covers most of the Afroalpine and Sub-afroalpine flora ecosystem.



5. Materials and Methods

Fig.2. Focus group discussion at different kebeles

Group discussion

Group discussion, interview, questionnaire and free observation were used for socioeconomic data survey and identification of tourism potentials both at the zonal, woreda and kebele level. Out of 16 kebeles directly and indirectly influencing mount Guna, six kebeles (3 from Farta, 2 from Misrak Estie and 1 from Lay gaint woredas) were selected for focus group discussion. From each kebeles the size of the group participated during group discussion varied from 19 to 32 members with an average of 23 participants in five kebeles and particularly in one kebele 295 members were participated. The open-ended questions used during the discussion are presented in annex (Annex 8).

Line transects

Ground surveys were conducted using line transect to locate habitats having highest density of wildlife. 4 Sampling units (transects) having 2 to 5km length (a total distance of 17km) were selected systematically and each was surveyed within one sampling session (early morning or late afternoon). The start and endpoints of transect lines were clearly identified before and after the survey. We have recorded animal and plant species and ecosystem/habitat kind seen at a distance of 200 meters on

both sides of the transect line. During the observation of larger mammals and bird species, the type of species (diversity), their location and associated vegetation (habitat) type were recorded. Location of observed mammals and bird species were marked using GPS (Global Positioning System). Observations were done with naked eyes and with the aid of Binoculars. Identification of plant, mammals and bird species were done using field guides and personal experience. Photographs were taken for further confirmation. All available indirect observation methods for identification mammals and birds such as vocalization, droppings, carcasses, feeding sign, burrows, and footprints were used. Local guides from the indigenous people were used for observation and identification of wildlife and vegetation cover of the area. Suitable natural wildlife habitats for direct observation were used for studying the distribution of the target species. All available secondary data about the area have been collected. The data collected were analysed to identify the types of plant, mammalian and bird species found in mount Guna and its interaction with the socioeconomic condition of the local community.

6. Results and Discussion

6.1. Ecosystem Status and Representativeness

50% of all the highlands above 2000 m and 80% of all the highlands above 3000 m in Africa are located in Ethiopia. These mountains enabled the evolution of an abundance of endemic animal and plant species confined to the Afro-alpine ecosystem. In Ethiopia Afroalpine and Sub-afroalpine ecosystems above 3400m accounts about 5000 km² of the total area.

Of the total area of Afroalpine and Sub-afroalpine ecosystems (11887 km² above 3200m) found in sub Saharan Africa, Ethiopia accounts 73% (8677km²) of the habitat. 83% (7220km² above 3200m) of the Afroalpine and Sub-afroalpine ecosystems is located in 9 mountain ranges (Bale-1990km², Arsi-1000km², Simen-960km², North wollo-1150km², South Wollo-1220km², Choke-500km², Guna-210km², Menz Guassa-124km², Gosh Meda-90km²). The three mountain ranges-Bale, Arsi and Simien together accounts 60% of the total Afroalpine and Sub-afroalpine ecosystems in the country (Grima Eshete, 2010).

In mount Guna, there are 110km² lands above 3400m and 40km² above 3800m asl. According to previous studies (1988-2000), about 59% of all the Ethiopian highlands above 3200m (4236km²) have been converted to settlements and farmlands. Of the Afroalpine and Sub-afroalpine ecosystems (210km² above 3200m) considered to be potential habitat for Ethiopian wolf in Mount Guna, only 51km² suitable habitat is remained (76% lost) (Sillero-Zubiri *et al.*, 2004). According to our observation, we have seen settlements above 3600m and cultivation up to the tip of the mountain



plateau above 3700m. The remaining area above 3600m is now completely under free grazing pressure. These mountain ridges are currently considered as a communal livestock grazing land owned by the three Woredas.

Fig.3. Guassa grassland habitat

The Guna highland comprises Afroalpine and Sub-afroalpine ecosystems dominated by *Festuca* grass land habitat extremely devastated. Along rock heaped and hillsides, scattered and slightly rose from surrounding, hills are covered with open grassland, shrub land dominated by *Erica arborea* with scattered Giant lobelia. Most of Mount Guna landmass is above tree line (greater 3700masl or timber line characterized by open grass land). The water shed drains to all direction as a main water source for rivers. Because of these, this highland ecosystem is considered to be an upstream source of major rivers that drain to Tekeze, Abay basins and Tana sub basins. Based on the distribution and abundance of vegetation types, we have identified at least five kinds of habitats. These are:

Festuca/Guassa Grassland

This habitat type occupies most areas of the Afroalpine and Sub-afroalpine ecosystems on from gentle slopes to flat terrain of mount Guna. *Festuca spp*, *Thymus schimperi*, *Andropogon squamulatus*, *Crepis spp*, and *Helichrysum spp* are the most commonly seen plants in this habitat. It is the most important

habitat as far as wildlife existence, and human and livestock use is concerned. Currently, this habitat is under heavy threat from free grazing, settlement and agricultural expansion from both sides. On the other hand, *Tachyoryctes splendens* and *Arvicanthis abyssinicus* which are important food items of Ethiopian wolf and other *Canis spp*, are highly dominant in this habitat.

Helichrysum-Festuca Grassland

This habitat is located in areas near the tip of mount Guna along hillsides where the soil is poor and rocky. Plant spp commonly found in this habitat are: *Festuca spp*, *Helichrysum citrispinum*, *Lobelia rhynchopetalum* and *Helichrysum hochstetteri*.



Fig.4. Helichrysum-Festuca grassland habitat

Erica Moorland

This habitat is located as small forest patches above 3600m asl in well drained areas along hillsides. The lower part of these ericaceous moorlands are important source of water for Ribb and Gumara rivers (they are among major rivers in Lake Tana Sub-Basin). The area above ‘Rigb washa Medihanialem church and village’ particularly in ‘Lim Sar’ along the hillsides of Ribb River sources in Moksh Kebele from Farta woreda side, we have seen 40 hectare remnant Ericaceous land that is currently regenerating and protected. Within the valleys of the hillsides near this Ericaceous land, there are four natural spring water which are the source of Ribb River. From Eastern Estie Woreda side in Elet Dibana Kebele at Ambo Village starting from the source of Wanka river to the upper hillsides, we have also observed ericaceous land that is three to four times that found at ‘Lim Sar’ in Moksh Kebele. *Erica arboria*, *Echinops ellenbeckii*, *Hypericum revolutum*, *Lobelia rhynchopetalum*, and *Kniphofia foliosa* are the most commonly found plant species in this habitat. The use of Erica for Fire wood is

now abandoned by the local community due to the accessibility of *Eucalyptus globules* tree in the area as a result of plantation. It is probably because of this that the Ericaceous moorland is now regenerating along the hillsides in areas above 3600m asl.



Fig. 5. Erica moorland habitat

Lobelia-Festuca Grassland

This habitat contributes the largest proportion next to Guassa grassland in wide ranges. *Festuca spp*, *Lobelia rhynchopetalum*, *Kniphofia foliosa*, and *Helichrysum spp* are the most commonly seen plant species in this habitat.

Swampy Grassland

This habitat is found only along valleys of hillsides where there are important springs which are source of water for rivers. It is entirely covered with *Festuca spp* and is the smallest by area from other habitats.

Fig.6. Lobelia-Festuca grassland habitat

6.2. Biodiversity and Endemism

In Ethiopia the altitudinal variation produces varied macro and micro climatic conditions that affect nature and humans and contribute to the formation of diverse ecosystems. Such an ecological complexity is one



of the main reasons that explain why Ethiopia holds one of the highest diversities of animals and endemism levels in Africa (Saavedra *et al.*, 2009, Alemayehu Edossa, 2010). The flora of Ethiopia is estimated to comprise between 6,500 and 7,000 species, of which about 12% are considered to be endemic. The total number of woody species of Ethiopia is estimated to be 1017, out of which 29 tree species, 93 shrub species and 2 liana species are endemic. The fauna is also highly diverse: 284 species of Mammals (31 or 11% endemic), 855 of Birds (18 or 2% endemic), 201 species of Reptiles (10 or 5% endemic), 63 species of Amphibians (25 or 39% endemic), 188 species of Fish (37 or 20% endemic), 1225 species of Arthropods (7 or 0.6% endemic) are recorded from Ethiopia (Clements, 2007). Out of 201 species of reptiles, 87 species are snakes, 101 species are lizards and 13 species are tortoises and turtles.

Many of the endemic animals of the country are specifically associated with high altitude moorland and grassland habitats, mainly in the Bale Mountains National Park (19 mammals and 6 birds species are endemic). The high mountains of Ethiopia also host 15 and 13 endemic species of Birds and Amphibians respectively (Alemayehu Edossa, 2010; Abrahama Marye, 2010).

However, this large biodiversity is seriously threatened. Much of the Ethiopian landscape from sea level up to 4,000m is now altered by agricultural activities, deforestation, overgrazing, and settlement in order to fit the basic necessities of a growing human population. This habitat deterioration is particularly threatening the afroalpine ecosystems and as a consequence, species are being depleted before scientific information about them is obtained (Saavedra *et al.*, 2009).

6.2.1. Mammals

At least 30 different mammal species belonging to 14 families and 8 orders have been detected in the Mount Guna and its environs (Annex 2). This accounts 11% of the terrestrial mammal species, 35% of the families and 57% the orders found in Ethiopia. From the 31 endemic species known for Ethiopia and Eritrea, six have been found in the area (19%). Out of 284 species of mammals in Ethiopia, 52 are threatened: 5 are critically endangered, 8 are endangered, 27 are vulnerable, and 12 are near-threatened. Similarly, among 30 mammals recorded in the area, 4 are threatened species (8%): 1 endangered, 2 near threatened and 1 data deficient are found. The six endemic species of mammals found in the area are given in Table 1. Of these three are small mammals (two are rodents).

Rock hyrax (*Heterohyrax brucei*), Common mole rat (*Tachyoryctes splendens*), Unstriped grass rat (*Arvicanthis abyssinicus*), Golden/Common jackal (*Canis aureus*), Black-backed jackal (*Canis mesomelas*), and Crested porcupine (*Hystrix cristata*) are among the most commonly seen mammals in the area. Focus group discussion and interview with selected local communities revealed the existence of Gelada baboon and Ethiopian wolf, and other species particularly adaptable to rocky habitats, cave and den in the area. Spotted hyena (*Crocuta crocuta*), striped hyena (*Hyaena hyaena*), Common duiker (*Sylvicapra grimmia*), Klipspringer (*Oreotragus oreotragus*), Caracal (*Caracal caracal*), Leopard (*Panther pardus*) and African civet (*Civettictis civetta*) are some of the large mammals present in mount Guna. The Ethiopian wolf, *Canis simensis*, is the only true wolf species in Africa. Phylogenetic analysis using DNA suggested that the Ethiopian wolf is more closely related to the grey wolves (*C. lupus*) and coyotes (*C. latrans*) than to any African canid. It is now one of two canid species listed by the IUCN Red List of Threatened Animals in the critically endangered category (IUCN, 2003).

Table 1. List of endemic mammals in mount Guna

No	Order	Family	Common Name	Scientific Name	Conservation Status
1.	Carnivores	Canidae	Ethiopian Wolf	<i>Canis simensis</i>	A, B ,C, E, EN
2.	Primates	Cercopithecidae	Gelada baboon	<i>Theropithecus gelada</i>	A, B, E, LR/nt
3.	Lagomorpha	Leporidae	Ethiopian Highland hare	<i>Lepus starcki</i>	A, B, E, LR/lc
4.	Soricomorpha	Soricidae	Bailey's shrew	<i>Crocidura baileyi</i>	A, E, LR/lc
5.	Rodents	Muridae	Abyssinian grass rat	<i>Arvicanthis abyssinicus</i>	A, E, B, LR/lc
6.			White-footed rat	<i>Stenocephalemys albipes</i>	A, E, LR/lc

Note: A= Reported in 2010 by Abraham Marye, B=Observation during the fieldwork (2012), C= Recent observation by locals, T=Threatened (CR=Critically Endangered, EN=Endangered, VU=Vulnerable and NT=Near Threatened), LC=Least Concern, DD=Data Deficient, LR/cd=Lower Risk/conservation dependent, LR/nt=Lower Risk/near threatened, LR/lc=Lower Risk/least concern, E=Endemic to Ethiopia

The world population of the Ethiopian wolf has been estimated to be 450 to 500 individuals of which about half live in the Bale Mountains of southern Ethiopia. More recently, field surveys confirmed the existence of 442-487 wolves in seven isolated Ethiopian Afro-alpine units (Simien 40-54, Guna 7-10, South wollo 16-19, North wollo 19-23, Menz Guassa 17-23, Bale 250 and Arsi mountains 93-108) while extinct in Mount Choke and Gosh meda (Marino, 2003). In our survey we have also confirmed the existence of Ethiopian wolf in mount Guna from discussion and interview with the local communities and particularly from shepherds who frequently visited the Afroalpine area either to herd

their livestock or collect grass. According to the informants, a pair of Ethiopian wolves was seen in October 2012 at 'Beredo mefiya', one of the highest place-4102m in mount Guna where Ice observed during the cold season. These parts of mount Guna are largely occupied by Gussa, *Helichrysum-Festuca* and *Lobelia-Festuca* grassland habitats where Common mole rats and Abyssinian grass rats are commonly seen.



Fig.7. some of endemic animals found in mount Guna

Moreover, Gelada baboon, the other endemic and threatened large mammalian species are also known to exist in the area. This flagship species among Ethiopian mammals are highly specialized to grasslands and cliffs at high elevations on the plateaus (>2350m). They have a very restricted

distribution in the Central and Northern highlands of the Ethiopian plateau with an estimated population of 600,000 individuals (Saavedra *et al.*, 2009). This species is classified as near threatened (IUCN, 2003). The most immediate threat to the gelada's survival comes from farming that increasingly eats up grasslands and other Afroalpine habitats. According to the local community at least 100 to 200 individuals exist at two localities, one at 'Jib Washa' between Dibana and Dat Kebeles in Eastern Estie Woreda and the other at 'Molalie Gedel' in Moksh Kebele, Farta Woreda. However, Abraham Marye (2010) has reported their number to be around 15. Hence, this animal is now locally endangered for extinction.

6.2.2. Birds

At least 139 species of birds from 41 families and 14 orders have been identified in the area (Annex 3). This accounts 16% of bird species, 46% of the families and 56% the orders found in Ethiopia. From the 18 endemic bird species found in Ethiopia, 5 species have been found in the area (28%). 8 species of birds out of 13 both endemic to Ethiopia and Eretria are recorded. We have seen higher density of

birds of prey species due to the high density of rodents occupying the area. The endemic species of birds found in the area are given in table 2. Out of 855 species of birds of Ethiopia 36 are threatened: 2 are endangered, 14 are vulnerable, 16 are near-threatened and 4 are data deficient (saavedra *et al.*, 2009). In mount Guna 5 threatened species (1 endangered; 1 vulnerable and 3 near threatened) have been recorded (14%).

Table 2. Endemic Bird Species of Ethiopia Found in Mount Guna and its Environs

No	Common Name	Scientific Name	Amharic Name	Conservation status
1.	Black-winged lovebird	<i>Agapornis taranta</i>		A, [E]
2.	Wattled ibis	<i>Bostrychia carunculata</i>		B, [E]
3.	White collared pigeon	<i>Columba albitorques</i>		A,B, [E], NT
4.	Thick-billed raven	<i>Corvus crassirostris</i>		A,B, [E]
5.	Blue-winged goose	<i>Cyanochen cyanopterus</i>		A, [E], NT
6.	Abyssinian long claw	<i>Macronyx flavicollis</i>		A, B, E, NT
7.	Ruppell's Black Chat	<i>Myrmecocichla melaena</i>		B, [E]
8.	White-winged cliff-chat	<i>Myrmecocichla semirufa</i>		A,B, [E]
9.	White-billed starling	<i>Onychognathus albirostris</i>		B, [E]
10.	Abyssinian catbird	<i>Parophasma galinieri</i>		B, E
11.	Ankober serin	<i>Serinus ankoberensis</i>		A, B, E, EN
12.	Black-headed siskin	<i>Serinus nigriceps</i>		A,B, E
13.	Spot-breasted lapwing	<i>Vanellus melanocephalus</i>		A, E

Note: A= Reported in 2010 by Abraham Marye, B=Observation during the fieldwork (2012), T=Threatened (CR=Critically Endangered, EN=Endangered, V=Vulnerable and NT=Near Threatened), E=Endemic to Ethiopia, [E]=Endemic to Ethiopian and Eretria,

The relative importance of mount Guna and its environs for conservation of bird species has been evaluated for category A1, A2 and A3 based on the criterion and categories of Birdlife International to test whether it can be used as an Important Bird Area (IBA) of Ethiopia like other IBAs (69 sites) in the Country (EWNHS, 1996).

According to **category A1 (Globally threatened species) criterion**, the area must regularly hold

significant numbers of a globally threatened species, or other species of global conservation concern.

Mount Guna hosts 5 globally threatened species:

- ❖ Ankober serin (*Serinus ankoberensis*): Endangered
- ❖ Great spotted eagle (*Aquila clanga*): Vulnerable
- ❖ Abyssinian longclaw (*Macronyx flavicollis*): near threatened
- ❖ Blue-winged goose (*Cyanochen cyanopterus*): near threatened
- ❖ White-collared pigeon (*Columba albitorques*): near threatened

Similarly based on **category A2 (Restricted range species)** criterion, the area must hold a significant component of a group of species whose breeding distributions define an Endemic Bird Area or Secondary Area, which are defined as places where two or more species of restricted range occur together. For category A2, Ethiopia has three globally recognized Endemic Bird Areas (EBAs) and one secondary area within it. These are: *Central Ethiopian Highlands, South Ethiopian Highlands, Juba and Shebelle Valleys and Northern Ethiopia secondary area.*

- ❖ Out of the Four species that belong the *Central Ethiopian Highlands* EBA, two are found in the mount Guna:
 - Rüeppell's black chat (*Myrmecocichla melaena*)
 - Ankober serin (*Serinus ankoberensis*)
- ❖ A single species out of three that belongs to *Juba and Shebelle Valleys* EBA is found in mount Guna:
 - Salvadori's weaver (*Ploceus dichrocephalus*)

Finally according to **category 3 (Biome-restricted assemblages)** criterion, the area must hold a significant component of the group of species whose distributions are largely or wholly confined to one biome. Ethiopia has birds from four biome assemblages:

- ❖ Afrotropical Highland Biome (49 species)
- ❖ Sudano-Guinea Savannah Biome (16 species)
- ❖ Somali-Masai Biome (98 species)
- ❖ Sahel Transitional Biome (8 species)

The Afrotropical Highland Biome has 49 species of which 7 are endemics. Mount Guna hosts at least 29 Highland Biome species which accounts 59% of the Afrotropical Highland Biome assemblage species found in Ethiopia. The richest sites for this biome assemblage are the Bale and Simien Mountains National Parks and mount Abune Yosef representing 42 species (88%), 33 species (69%) and 36 species (75%) of the species assemblage respectively (EWNHS, 1996; saavedra *et al.*, 2009).

Mount Guna also hosts 5 out of 98 species that belong to the Somali-Masai Biome species assemblage and two out of 16 species that belong to the Sudano-Guinea Savannah Biome species assemblage. In spite of its small size, mount Guna and its environs could be taken as one of the most important area of the country for birds conservation as revealed from endemic birds (13 species) and categories A1 (5 species), A2 (3 species) and A3 representing 59 % of the Afrotropical Highland Biome assemblage of species found in Ethiopia.

6.2.3. Plant diversity

At least 96 species of plants are recorded in the Afroalpine and Sub-afroalpine ecosystems of Mount Guna and its environs (Annex 1) out of which 5 species (*Acanthus sennii*, *Echinops ellenbeckii*, *Kniphofia foliosa*, *Lobelia rhynchopetalum* and *Helichrysum hochstetteri*) are endemic. The flat terrain of the Afroalpine ecosystem zone of mount Guna is largely covered with extensive moorland dominated by Guassa and Lobelia grassland habitats. In higher areas, it is interspersed with the giant herb lobelia (*Lobelia rhynchopetalum*), shrubby and herbaceous everlasting flowers (*Helichrysum spp.*), *Kniphofia foliosa* and *Echinops ellenbeckii*. In lower areas (below 3800m asl) and in the Sub-afroalpine ecosystem zone, the evergreen tree heather (*Erica arborea*) blend with *Hypericum revolutum* and *Echinops ellenbeckii* are recently rehabilitating in Devana (Eastern Estie Woreda) and Moksh kebeles (Farta Woreda). In areas down 3600m trees of Eucalyptus globules, *Erica arborea*, Cupressus lusitanica, Juniperus procera, Myrica salicifolia, Mytenus arbutifolia, Hypericum revolutum, and *Dombeya torrida* along cultivated and grazing lands, homesteads, and settlements are predominant.

6.3. Hydrology status

Mount Guna is not only source of biodiversity and livelihoods but it is also important as water catchments from which more than 41 rivers and numerous streams emerge and join to two basins

(Abay and Tekeze basins) and Tana sub basin. Rivers and streams emerged from mount Guna escarpment that forms the major part of these basins are: Ribb, Gumera, Beshelo, Wanqa, Gedeba, Zoga, etc. Mount Guna is the source of both Gumera and Ribb Rivers. Gumera is one of the main Rivers on the east side flowing to Lake Tana. It drains mountain Guna and drops its load in the low land to the mouth of Lake Tana in the Southeastern direction. Ribb River drains highlands of Debre Tabor and flows across the flat land from Woreta to Lake Tana in the Eastern direction. These rivers and streams are important sources of freshwater both for drinking and agriculture in the downstream areas for about 44000 hectares (71% of the potential of the four major rivers) of land for irrigation.

The Tana Lake is fed by four large perennial rivers (Ribb, Gumera, Megach and Gilgel Abay rivers). They contribute more than 95% of the total annual inflow (Getachew Zewdie, 2010). Gumera and Ribb together account 42.9% of the total runoff to Lake Tana sub-basin. They flow all year round due to the continuous source of the groundwater of the highlands of mount Guna where 18.2% of the mean annual rainfall goes to groundwater (Getachew Zewdie, 2010).

Fig. 8. Dat Kebele Villagers

Thus, as the most upper catchments areas of tributaries to the two basins, the Afroalpine and Sub-afroalpine ecosystems of mount Guna have an important role in maintaining perennial river flow. Over use of this system would make the water flow seasonal, increase flooding and decrease dry season water availability. Therefore, conservation and management of this water catchment will maintain vital ecosystem processes that also contribute to ensuring food and livelihood security of the population residing in the catchments area within and far beyond the local people (regionally and internationally).



6.4. Socioeconomic Situation

6.4.1. The Living Community

Circumstantial evidences are dating back the issue of people in Guna massif for unknown long period of years. On these evidences, the Guna massif had harbored some peoples with abundant wildlife populations in the preceding time. And all respondents expressed that the human population has increased markedly since the 1981 EC, when the government moved people who were living at the lower altitudes of the mountain to settle them in the Afro and sub Afro-alpine part of the massif.

According to Ethiopian central statistical Office (CSA) 2010 report, recently more than 114,931 peoples have dwelt in the surrounding kebeles of Guna. Further the rural population living in and near mount Guna is reported to be 114,931 of which 21.2%, 37.6 % and 42.2 % are from Misrak Estie, Farta and Lay Gaint woredas, respectively. It has been estimated that population density is very high ranging from 289 – 171 persons/km². Table 3 is also exhibit that the higher proportions of the people are found in Awzet, Arga and Dera Kefoyea/Kebela 015.

Like most Ethiopian highlands, the inhabitant's livelihood is characterized by subsistence agriculture, which includes crop farming and animal husbandry. So, ecosystem elements of mount Guna are critically important for the local community subsistence; provides fodder, water, construction material, fuel wood, etc. Indeed, the resource use conflict between the local community livelihood demands and the imperatives of the Guna's biodiversity conservations are bound to increase with increasing population density and agricultural activities.

Nowadays, human Settlement appears in all kebeles of mount Guna, including in areas that are considered previously as too cold for agriculture and too inhospitable for habitation. As it is observed in the field, mount Guna keeps on losing the natural vegetations ground to satisfy the food needs, livestock pasture, and construction and fuel wood demands of the living community it supports. Therefore, the natural habitats of Guna have now become ecological islands at less than 32.44 % of the Guna surface that almost entirely above 3500m asl, degraded by overriding human pressure, and suffering from an ever-increasing farm land expansion , Overgrazing, and the natural vegetation removal and substitution edges effect.

Table 3. Guna proposed Community Conservation Area Population by Kebele

Woreda & Kebelea	Population			Kebela Area in Km ²	People/km ²
	Male	Female	Total		
Moksh	3,771	3,542	7,313	38.489	190.00
Soras	2,843	2,745	5,588	24.7561	225.72
Awuzet Azawur	3,958	3,760	7,718	26.6881	289.19
Ata didim	4,333	3,993	8,326	34.922	238.42
Arga Didim	4,409	3,940	8,349	30.3381	275.20
Mynet	2,993	2,921	5,914	25.1203	235.43
Lay Gaint					
Titira /04/	3,835	3,570	7,405	42.3519	174.84
Minch Wiha /012/	4,080	3,865	7,945	41.2681	192.52
Akabit /09/	4,377	3,979	8,356	39.2235	213.04
Guna Gedeba /010/	4,987	4,688	9,675	54.5574	177.34
Guzana Shedo /011/	3,208	3,013	6,221	29.4258	211.41
Dera Kefoye /015/	3,915	3,864	7,779	30.6319	253.95
Misrak Estie					
Liwaye Ashama Gedayat	3,632	3,495	7,127	37.9969	187.57
Wichi Basenika	2,100	1,899	3,999	18.8795	211.82
Elete Dibana	3,739	3,596	7,335	35.0945	209.01
Dat Giyorgis	3,038	2,843	5,881	34.2613	171.65
Total	59,218	55,713	114,931		

What is clear with the natural habitats loss or degradation is that undermines of the resource base which the majority of the population heavily depends on. And as the natural vegetation underpins the livestock pasture and flood protection; its loss implies significant consequences for mount Guna community wellbeing.

In this regard, respondents and visual impressions have presented convincing evidence that the removals of natural vegetation from Guna uplands effect for severe soil erosion. And With the deteriorations of the natural flood protection and retention functions, now a days the upland soil runoff and flooding is recognized as a major problem for all Guna community; and particularly getting worse in the upper part of Mokish, Dat, Elet Dibana, and Guna Gedeba kebele.

The other challenge which becomes evident is that the mount Guna natural significance to soak up rainfalls of the summer and to discharge it gradually through groundwater in maintaining consistent stream and river flows for all year. In this regard residents reveal that most streams and rivers are drying up or becoming shallow after January.

In general, the sustainability of current use of biodiversity for local wellbeing is a key issue. In this era is that of a multiple land use area, where the complete removal of human influence is not achievable or realistic. The concern is about maintaining the diversity of landscapes, ecosystems, communities and species threatened by expanding farm plots, livestock rising and unsuitable natural resource utilization.

6.4.2. Guna Biodiversity with Community Crop Production

Crop cultivation provides a major source of wellbeing for Guna massifs community. It provides employment and means of subsistence for their wellbeing. The overwhelming expansions of farm land on Guna massifs have also dramatic implication for the loss of biodiversity. Currently crop land has taken the Mount Guna up to 3700m asl.

However, with its climatic feature and importance in the community food baskets, the cropping pattern of the area remarkably characterized by very few type of crop production. In terms of production, potato dominates the cropping pattern. About 1,051,266 Quintals of potato has been produced in Ethiopian 2003/04 production year. Barley is the second most important crop in production (197,871 Quintals) followed by Wheat and Field Beans in the target area pattern (Annex 6).

But, if we look the Land use and covers of the mount Guna as a whole, it is easy to observe how intensive exploitation of farm plots utilizes the natural ecosystem of the area. Farm plots are found there up to 3700 m asl and steeper slopes, which can only give yields for a few years before the soil is washed away.

Since, then, the ecological impact of this crop land expansion in maintaining local community wellbeing has become not as surprisingly established fact. The loss and degradations of the farm land soil runoff and flooding controls mechanism is the most widely recognized consequence of such

change. The field findings also witnessed that farm plot degradation is widespread and sever phenomena of all Guna community.

Even if we couldn't get primary studies on Guna annual soil runoff values, Hans Hurni (1998), International Mountain Society (2010) and many other scholars have portrayed a severe Land degradation problems of the Ethiopian highlands. For instance, Hurni (1998) estimated the Soil erosion rate from the Ethiopian highlands' cultivated land "on average 42 tons per hectare per year.

The soil erosion leads not only the diminishing depth and physical alteration of the soil, but also to remove the specific nutrients, thereby causing loss of soil productivity. That is why; the Guna inhabitants have bound their time and great concern for collecting manures from grazing lands as a substitute for fuel demand. In the informal interview that was conducted at Mokish and Dat Kebela, respondents phrase the fact as, "it is too difficult to harvest potato production without the application of manure and fallow year for farm". With such low productivity of Ethiopian high land farms generally less than two hectares in size, contributes to extreme poverty and food insecurity, as evidenced by recurrent problems of famine and incomes of less than one dollar per person per day (Rea Tschopp, Abraham Aseffa *et al.*,. 2010).

In Mount Guna, the expansion and intensive exploitation of Crop land is also taking poses a threat of farm land degradation. Even if we couldn't get primary studies on Guna annual soil runoff values, Haile Gebreezgi and et al (2001), Bereded Hailu and Tesema Areaya (2010) indicated the Land degradation problems of the Ethiopian highlands. For instance, Haile Gebreezgi and *et al* (2001) estimated on average 69 tons per hectare per year Soil erosion from Ethiopian highlands' cultivated land.

In Guna, the food production problem of the community who lives particularly above 3200m asl is further compounded by lower oxygen and high moisture bio-physical features, which is noted as unsuitable to alter both the agricultural functioning and productions. From remarks of the focus group discussions "their sorghum production harvest has taken 9 month from seeding up to its harvesting and they are highly vulnerable for all year round frost risk.

Therefore, the process of meeting current or future welfare demands should not continue without regard to the potential long-term dangers of land resource over-use. And, designating the Protection & sustainable natural resource management system for the remaining habitat, and where settlement and land use are to planned and coordinated that is nominated as a transition and development can insure the long-term viability of the area, and offer what are perhaps the best places where dual objectives of conservation and rural livelihoods can be achieved.

6.4.3. Guna Biodiversity with Community Livestock Production

In mount Guna besides farming, livestock rearing is the other economic activity that Supports crop cultivation and HH's economy. Livestock is considering as the principal source of wealth to the farmers. Livestock is also deserved as the only source of energy for ploughing and threshing harvested crops, as a means of transport, as the main source of manure for crop farm and means of



income from the growing meat demand. They are also important for providing meat, milk and milk products for local livelihood.

Fig.9. Grazing pressure in mokish Kebele

Indeed, to meet all these needs, the Mount Guna an inhabitant needs to own herd that includes cattle, sheep, horse and mule. From focus group discussions and informal interviews, it is quite easy to

conclude that *household without any animal is unlike at the surroundings of Guna*. The destitute household at least would have 6 sheep and 2 mules or horse. The rich families are those who have 1 Ox, 2 cows, 2 horses, 2 mules and as many as 15 sheep.

Especially in up-lands of Guna horse are used for ploughing. This is in part explaining the considerable number of horses compared with other villages. The three woredas office of Agriculture Data also noted around 181,797 head of livestock or 77,116.01 TLU [excluding chicken and Bee Hives] in and around mount Guna. Cattle constitute the largest share, 68.9 % of the TLU followed by pack animals that include horse, mules and Asses 21.08 %. Sheep and goat have a share of 9.25 percent of the total. The proportions of other species are very low. The highest concentrations of livestock found in Dat Kebela [15,174.01 TLU], Elet [8,505.54 TLU] and Lewaye [6,023.16 TLU] [Misrak Estie].

Far from its contribution to the life of the rural households; the community livestock interaction with the natural resource of the area is of acute importance to the sustainability of the Guna massifs. Livestock now covers almost all grass territory of the massifs, and occupies a vast area, that was once habitat for wildlife.

As a major natural resource user, the substantial influence of the livestock has already observed in a context of increased pressure on the natural land degradation mechanism. The degradation of *Festuca* spp [GUASSA/CHEMA] is now widely recognized as a serious threat to mount Guna habitats and livestock production it supports. The analysis of the community response on the availability and adequacy of this natural pasture has proven to what extent residents are threatened by the degradation of the grassland that traditionally used for the community pasture. In all focus group and informal discussions, respondents acknowledged the natural pasture shortage as one of the current serious challenge for their wellbeing.

The field observation findings also witnessed that the highest stocking density with the horse and mule's pressure and extraction from communal Grazing land triggers for devastating land degradation. And except in the area that found above 3500 m asl with relatively better grazing pressure; all other grass land is now covered by short grass [not more than 2 cm] vegetation pattern.

For this reason, community conservation approach that would help to protect for the remaining natural habitats is essential. Such action could enable a considerable enhancement of pasture for peoples who are living in the transition Zone of Guna, and provide ecological benefits to many more.

Table 4. Livestock Population in and around mount Guna

LIVESTOCK	Population in Number	
	Count	Percent
Oxen	18423	10.13
Cow	18790	10.34
Heifer, Calves,	29366	16.15
Sheep & Goats	88619	48.75
Horse	7538	4.15
Ass	6435	3.54
Mules	12626	6.95
Total	181,797.00	

Source: compute from Annex 7

6.5. Mount Guna Proposed Community Conservation Area Value's for Tourism Development

As noted earlier, mount Guna is part of the Ethiopia Afroalpine and sub afroalpine ecosystems. Hence, safeguarding and conservation of the Natural landscapes provide recreational and exercise opportunities for humans' well-being and intellectual development; with its outstanding beauty, diverse attractions and great tourism potential.

One of the natural attractions is the Majestic Scenery Site of Mount Guna. From the Beredo Mefeya rise the highest peak of the mountains, along with the upper part of Mokish, Dat Geyorgis, Akabit and Guna Gedeba which together make up the central peaks area. The Beredo Mefeya and all other plateaus over 3800masl show evidence of shield volcanoes.

In these plateaus, we observed the lava flow area; a broken, rocky area lies in the outer surface. And, the study of Addis Ababa University College of Development Studies and Amhara National Regional State Culture and Tourism Bureau (2009) reported that Guna massif as one of the younger volcanic centers in the country; it has been dated at 10.7 million years. This study also noted *the unique geomorphology of the mountain makes it to be exceptionally attractive for mountain climbers and trackers.*

The Afroalpine and Sub-afroalpine ecosystems of mount Guna and its environs with its more than 96 plant species will be a key feature of Guna Community Conservation Area and, as well as providing

vital habitat and ecosystem service, is an attractive scenic feature in their own right. In the upper part of Mokish, Dat Geyorgis, Akabit and Guna Gedeba walkers along *Festuca Spp*, *Helichrysum Spp*, *Lobelia Rhynchopetalum* and *Erica arboria* species with numerous streams and river banks can be reward by stunning natural scenery.

The Guna Community Conservation Area development endeavor would safeguard habitats for 30 higher and small mammals, for 139 Bird species. The Guna Massif is also serving as a home for 6 and 13 endemic mammals and birds respectively.

The Guna Community Conservation Area development has profound significance not only for all natural values mentioned but also for its role to fix together surrounded by various cultural, historical



and natural heritages that would independently not have the potential to tempt visitors spend time and money.

Along the route one can find:

Fig.10. Different heritages found in Zur Aba Abune Aregawi Monastery.

- Gafat: it is located about 4.4 kilometers to

the northeast of the town of Debre Tabor. Gafat is well known by Emperor Tewodros cannon production site. This Historical site with its ruin of residential house particularly used for 8 English artisans, walled-sites for residence and smelting iron and iron slag scattered all over the place worth preserving as a great potential for tourist attraction.

- The Semernaha palace: it is placed about 9 kilometers to the northeast of the town of Debre Tabor. The Semera palace has built by Emperor Yohannes IV in 1872. And in this compound the emperor established a palace church of the Trinity.
- Zur Aba Abune Aregawi: it is located at 428 343m East and 1292 455m North in East of Guna: It is founded in 533A.D. by St Yared who is credited with inventing the Sacred hymn

[*zema*] that has been used in the Ethiopian Orthodox Church continuously for the last almost 1500 years. *In this ancient church earliest* manuscripts and precious examples of ecclesiastical arts, religious icons, emperors and famous historical men facilities and clothes are stored safely in their treasuries to be witness of the past. The way from the main road to the church comprises cereal based extensive agricultural fields and climb up walking on plateau which provides a very beautiful view overlooking both sides from a single point, with the well known religious school “Zemarie mewasit University” of Zur Aba Aregawi.. This “university” is settling there to learn and spiritually uplifting youths, who have coming from different parts of Ethiopia, on the earliest manuscripts and sacred books of the Ethiopian Orthodox Church. This university Settle there to secure Continuity of the sacred tradition to the present.

- Wukro Medhaniale rock hewn church: it is located at 4km from Kimr Dingay town. It was first built by saint Lalibela and finished by Saint Abune Melketsedik.
- Saint Betel hem church: it is located at 34km from Arib Gebeya town and established in the 4th century during Emperor Abreha Atsibeha reign. It is considered as the sole “Digua university” school in the history of the Ethiopian Orthodox religious.

6.6. Threats/ Challenges of Mount Guna and its Environs

A threat/challenges, for the purposes of this study, is defined as any factor, resulting either directly or indirectly from human activities (legal or illegal), that has the potential to destroy, degrade, or impair a principal ecosystem component (the Afroalpine and Sub-afroalpine ecosystems and the biodiversities within it) or its key ecological attributes (water tower of Abay and Tekeze basins and Tana sub basins) of Guna mount as a whole.

In Ethiopia, inappropriate agricultural practices, deforestation and overgrazing are affecting crop and livestock productivity of the rural poor and hence their livelihoods. These alterations of ecosystem services, due to changes in land use land cover, affect negatively the ability of the biological systems to support the human needs. These changes also determine the vulnerability of places and people to climatic, economic or socio-political disturbance. Of course, other environmental and socio-political issues added up, Ethiopia is one of the top six food aid recipient countries in the world (McClelland,

1998). Therefore, understanding the driving forces behind land-use changes and developing appropriate measures to control or at least minimize the effects will then be very important.

Mohamed–Saleem (1995) has shown that the Ethiopian highlands, areas with altitudes above 1500 m, cover about 500,000 km² accounting for about 45% of the landmass. These areas are home for about 88% of the population; more than two thirds of the livestock population; 95% of the cropped lands and 90% of the economic activities in the country.

The basis for early development of agricultural systems and high human population in this agro-ecological zone may have been the favorable climatic and ecological conditions, sufficient rainfall, moderate temperatures, and well-developed soils in these areas. It may be for this reason that the highlands have been settled for millennia and known for a similar long-standing agricultural history (McClelland, 1998). This long history of settlement and high population pressure brought about unsustainability in agriculture. The unsustainable agricultural practices along with many other physical, socio-economic and political factors have been the driving forces to a series of land degradation problems. According to some studies, the highlands of Ethiopia are considered to be amongst the most degraded lands in Africa (El-Swaify and Hurni, 1996).

It is estimated that about 1.9 to 3.5 billion tons of topsoil is being removed from the Ethiopian highlands, every year (EFAP, 1993). Consequently, some areas of the country are totally out of production where land is irreversibly damaged and the highland farmer and livestock are commonly considered as the culprit for such spectacular depletion of the country's natural resources. The Ethiopian Highlands Reclamation Study (EHRS, 1984) indicated that about 10 million farmers in the highlands could lose their farmlands due to land degradation.

The severity of soil erosion in the Ethiopian highlands is the result of the past and present agricultural activities, mountainous and hilly topography, torrential rainfall, and low degree of vegetative cover. The major causes and threats were assessed in field observation during transect walks and focus group discussion with the selected local community members of target groups. Pressure from agricultural expansion, livestock overstocking, over harvesting of natural resources and settlement are high level threats that are affecting a number of principal ecosystem components and requires immediate management action to mitigate their negative impacts on ecosystem health. These major

causes and threats identified in the transect walk and in the trend analysis of group discussion that degrades Mount Guna and its environs are discussed below.

6.7.1. Agricultural land expansion /Crop production/

The direct impact of population growth is increased consumption of resources which would lead to increased demand for food and other necessitate more intensive use of agricultural land. In the Guna highlands for example, increased population has lead to more widespread use of marginal land in order to meet the increased demand of human needs.

Fig. 11. Agricultural expansion near the tip of mount Guna in Elet Dibana and Dat Kebeles, Misrak Estie Woreda



Especially, farmers in Mokish kebele Farta woreda, Let dibana & Dat kebele of Misrak Estie woreda and of Akabit /09/ kebele in lay Gaynt wredas the agricultural land would be extended up to 3700 meter of mount Guna to cover

most of the remaining areas of the afro-alpine ecosystem constraining even more the afro-alpine habitats and the species that live only in these habitats.

In this respect, different land uses compete with one another, and can degrade the future productivity of the land and the quality of the environment in general. According to the data collected in the three woredas land administration, land use and environmental protection offices and ORDA 1475 land grabbers (farmers) raving or raising resources illegally that expand their agricultural land to the tip of Sub-afroalpine ecosystems were identified and reported to woreda courts and out of these 98 illegal farmers were charged (Table 5) .

Soil degradation in Mount Guna and its environs can be seen as a direct result of the past and present agricultural practices on the highlands/marginal lands.

6.7. 2. *Overstocking/grazing/*

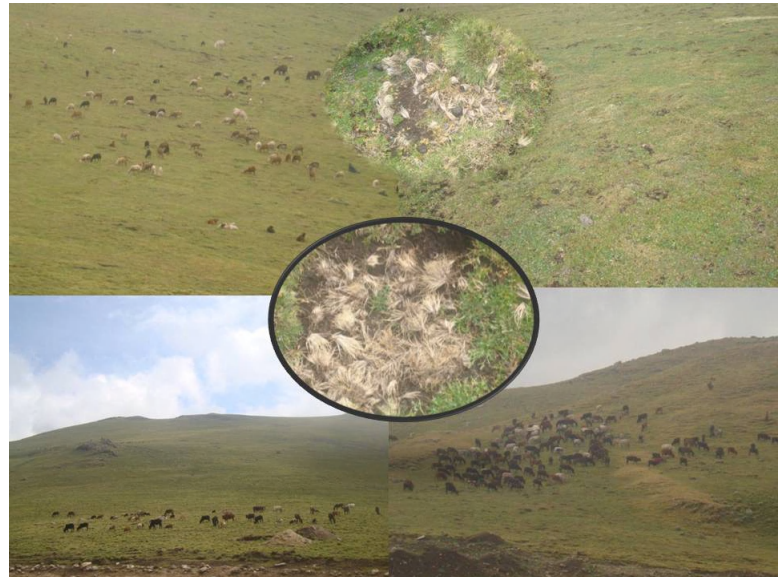
As in other parts of the Ethiopian high lands, livestock are essential for the livelihoods of rural people in Mount Guna and its environs. The deteriorating environmental conditions have also adversely affected availability of feed resources, leaving the areas herds poorly nourished and prone to diseases.

The fact that the Guna highlands support a large livestock population (Table 4), and also the core areas of mount Guna to its tip/4102 meter above sea level/ are fully utilized by huge livestock population.

The ever-increasing human population which resulted in an increase in cropland at the expense of traditional grazing areas, and livestock production in free grazing system, which has been aggravated the uprooting of Festuca grasses.

Fig. 12. High livestock density and free grazing pressure at the tip of mount Guna

The simultaneous upward surge in both human and livestock populations



would, therefore, bring about the depletion of the biological resources. This in turn would force livestock to move mainly to the upper slopes in search of feed or to concentrate on the small natural pasturelands/tip of Guna/. This has induced overgrazing and soil erosion, which eventually led to land degradation. Eventually Livestock are left to open grazing and the actions of animal hooves, especially, the small cloven hooves of sheep and slender legs with horny hoofs of domestic equines which destroying vegetative covers hence enhance land degradation. This is evident that over grazing in mount Guna contributing to deteriorate the water source of different streams and rivers that serves as tributaries of the three basins/Tana basin ,Abay basin and Tekeze basin/.

6.7.3. *Forest resources degradation/deforestation/*

Vegetation cover and dead plant biomass are known to reduce soil erosion by intercepting and dissipating raindrops and wind energy. Under this situation, lowest erosion rates have been recorded from undisturbed forests, with ranges from 0.004 to 0.5 t/ha per year (Kahasay, 2004). However, once forestland is converted to agriculture, erosion rates increase because of vegetation removal, over-grazing, and continuous cultivation. On the other hand, there is a better understanding that forests burnt in certain parts of the world are important contributors to greenhouse gases and

contributing to climate change. Overall these changes affect the livelihoods of societies.



Fig. 13. Land degradation due to deforestation and overgrazing

In Ethiopia, population pressure is inducing, the clearing of forests for agriculture and other purposes, and the attendant accelerated soil erosion, is gradually destroying the soil resource. This is because natural forests are the main sources of wood for fuel, construction and timber

production, even though plantation forestry is also increasingly becoming important (Hurni, 1998).

In the mount Guna, the Afroalpine and Sub-afroalpine ecosystems has been reduced over the last decades by intensive human use for subsistence agriculture, as in most of Ethiopian highlands, and it currently remains small patches of Erica in Mokish kebele Farta woreda and let-dibana kebele in Estie woreda. The direct impact of the forest destruction in Guna high land Afroalpine and Sub-afroalpine ecosystems was the creation of a wide gap between supply and demand for fuel wood, construction materials, timber and other forest products and further disappearance of the flora and fauna / for example, Ethiopian wolf/ of the area. Indirectly, this has brought about a change in climate and the soil is exposed to desiccation and erosion, has to reduce land productivity. In addition, deforestation can also impact hydrological processes, leading to localized declines in

rainfall, and more rapid runoff of precipitation, causing flooding and soil erosion, a common phenomenon in the study area and areas close to it.

6.7. 4. Water resource degradation

It is obvious that land cover can affect both the degree of infiltration and runoff following rainfall events, while the degree of land cover can affect rates of evaporation. Land cover has various properties that help to regulate water flows both above and below ground (Kahasay, 2004). For example, tree canopy and leaf litter can help to reduce the impact of raindrops on the ground, hence reduce soil erosion, while roots hold the soil in place and also absorb water. In the absence of vegetative cover, soil erosion will result and the effects of this phenomenon may result into siltation of Lake Tana due to water erosion.

South Gondar administrative zone landscape comprised by high altitude Mount Guna ridge as an upstream source of many rivers where drain to three basins that are Tana, Tekeze and Abay. Mountain .Guna has been serving as source of water in radial flow to surrounding inhabitants and wildlife. The major rivers where commences from the central highlands of Mount Guna are Beshelo, Gumara, Erebe, Gedeba, Zoga with many tributaries. These rivers have been washing fragile top soils of deforested, bare lands and unprotected continuously cultivated areas of their water shade. The effect of erosion has been aggravated by poor soil conservation measures and continuous cultivation of hillsides up to mount Guna around 4000masl (Abreham Marye, 2003).

The progressive water movement in many farm plots causes loss of top soil cover and slides which completely end up with rock outcrop. Due to loss of ground vegetation retention of water as a ground reservoir has been decreased and areas particularly around Wonaka, Emebet Marefiya, Tefmeukiya and Damot (029) that where swampy and marsh are now dried and possible to walk to cross even in rainy season. This effect has been manifested on the life of the community through limited growth of grass for dry season feed, loss of residual moisture for ground sprout development of potato; extended dry spell, frequently interrupted rain pattern and seasonal shortage of water. The people living at the top of the Mount Guna particularly in Damot Kebele are suffer from absence of drinking water in dry season. This will gradually decreases the release of water to feed rivers where commence from Mount Guna (Abreham Marye, 2003).

6.7.5. Settlement expansion

When villagization was very active at the verge of to end the Dergue regime the farmers of Mokish and Arga kebeles in Farta worda were settled in the mount up at 3600 m asl by villagization program. Once the Dergue regime was removed from power in 1991, the EPRDF also agreed with farmers to stay there and given new land to them. In addition to this, reports of the three woredas land administration, land use and environmental protection offices and ORDA proved that 113 farmers (table 5) of the bottom lands also established new settlement areas illegally above the sub afroalpine ecosystems. Unfortunately, the current reality on the ground is not so encouraging and the area is under serious threat. Increasing human pressures have resulted in unsustainable and unmanaged use of natural resources totally.

Fig. 14. Settlement and agricultural expansion in Mokish kebele, Farta woreda.



Generally, in association with settlement and agricultural expansion, demand for timber and wood increases both locally and commercially for building and fuel as does overgrazing burning of

Erica forest and shrub in Mount Guna has become recurrent and ecologically damaging, diminishing regeneration and altering the vegetation structure and composition of this ecologically important area. The increase in dogs associated with settlement and livestock has direct effects on wildlife through competition, predation, and the risk of disease transmission such as rabies and other canine diseases to Ethiopian wolves.

Table 5. Number of illegal settler farmers and amount of land illegally cultivated

Description	unit	Amount per woreda			
		Farta	East Estie	Lay Gayint	Total
Farmers illegally encroached Guna	No	1100	278	97	1475
Amount of land cultivated illegally	ha	253	55.41	10.79	319.2
Farmers willing to leave illegally owned land	No	599	199	0	798
Amount of land to be left by willing farmers	ha	66.1	38.1	0	104.2
Farmers unwilling to leave illegally owned land	No	478	79	0	557
Amount of land occupied by unwilling illegal farmers	ha	186.9	17.31	0	204.21
Unwilling illegal farmers charged to court	No	98	0	0	98
Farmers who constructed house illegally	No	96	12	5	113
<ul style="list-style-type: none"> • House made of grass 	No	82	4	4	90
<ul style="list-style-type: none"> • House made of corrugated iron sheet 	No	14	8	1	23
Basic schools constructed (alternative schools)	No	0	3	0	3

Source: the three woredas' land administration, land use and environmental protection offices land and ORDA.

7. Conclusion

This study was designed to develop an understanding of the existing community management and status of an Afro-alpine and sub-afroalpine ecosystems of mount Guna and its environs. Accordingly, efforts have been made to explore socio-economic and ecologic potential of the Mt.Guna afro-alpine ecosystem for the improvement of user community livelihood, their perception towards its management and its key ecological attributes (water tower of Tana sub basin, Abay and Tekeze basins)

In addition to these, the study tried to show the human livestock interference impact and the resulting conflict with the afroalpine ecosystem. The methods employed, which consist of ecologic survey using transect walk and focus group discussions with key informants were useful in addressing the aims and leading to the following conclusions.

The results of this study clearly confirmed mount Guna afro-alpine and sub-afroalpine ecosystems provide essential ecosystem economic goods and services basically important for the livelihoods of local communities in particular and to the country in general. Due to this fact, the majority of the local community had positive perception towards conservation of the ecosystem and its key ecological attributes (water tower of Tana sub basin, Abay and Tekeze basins). A good or positive perception towards communal Afroalpine and Sub-afroalpine ecosystems helps to protect or conserve its resources from the increased human and livestock interference impact by designing sustainable community development and participatory ecosystem management. This will avoid the existing human-natural resources conflict particularly in the core area/upper catchment/ of the mountain.

Currently, tremendous pressure of the swelling human and livestock population expressed through unsustainable resource exploitation from the ecosystem in the form of long time free grazing, frequent firewood collection, establishment of settlement and agricultural encroachment leads to erosion, gulley formation and eventually led to land degradation (ecosystem deterioration, like ground water maintenance, water quality, nutrient cycling and food chain support).

8. Recommendations

Field observation, discussion with the community and secondary data collected have revealed that unless possible conservation measures to reverse the existing threats undertaken, mount Guna and its environs would completely changed to agricultural and settlement lands. This highland mountain range is now exhaustibly exploited for activities beyond its natural potential and is far from sustaining in its natural process. This has caused the loss of biodiversity (fauna and flora) in the area. The root causes of major threats to wildlife and their habitats are: population growth, poverty, traditional cultivation, decreasing productivity, low awareness and sense of ownership on values of wildlife and their habitats, lack of suitable conservation measures and weak control of illegal acts. These root causes created conducive conditions for the community to make every effort in illegal

ways to look for additional farming, settlement and grazing areas to satisfy daily food demand through extractive and consumptive uses of resources. On the other hand, different studies showed that the area is known to be the home of globally important biodiversities and the source of the two of major rivers (Ribb and Gumera) of LakeTana sub basin. Hence, conserving this hotspot area both for biodiversity and ground water protection should be given due attention to take conservation actions. In doing so we recommend the following conservation actions that can be possible ways to reverse existing challenges of wildlife and natural habitats of Mount Guna and its environs.

8.1. Awareness Creation campaign

The objective of the campaign is to convince the local community about the importance of delineating mount Guna as a community conservation area. The area will be delineated primarily for the benefit of the local community and partly for conservation of the hydrogeology source of Lake Tana sub basin and subsequently to the Abay and Tekeze basin. The Awareness creation campaign, therefore, should be used to increase the knowledge of the local community on the values (ecological, social, historical and economical) of wildlife and their natural habitats. Community bylaws will be developed by the community themselves for sustainable use systems that promote the rehabilitation of wildlife and natural habitats and to reduce human induced challenges.

8.2. Delineation and zonation

The proposed community conservation area will have three zones: Core zone, Buffer zone and Transition zone. Zoning is a management tool that can be used to resolve resource and human conflict and applying it will improve implementation of suitable and effective management actions and activities (ALNP, 2010). This zoning system will help to develop suitable and agreed management and sustainable utilization techniques that are important to biodiversity conservation. It also helps for sustainable regulation, utilization and promoting tourism values for local communities.

- **Core zone:** it must include all the natural habitats from 3600m above sea level to tip of the mountains that are completely free of cultivation, grazing and settlements.
- **Buffer zone:** it surrounds the core protected areas and serves to buffer or shield the protected areas from the direct impact of human activities adjacent to the area (IUCN,

2011). This **zone** will include all areas below 3600m to 3400m where there are still a lot of cultivations and settlements.

- **Development zone:** where sustainable resource management practices are promoted and developed.

At this time at least the core zone must be delineated. Gradually between two to three years the other zones will be delineated based on the community agreement and full participation. After delineation, mount Guna and its environs will be established as a legally recognized community conservation area and it will be managed by the community itself and supported partly by the government and other partners when necessary.

8.3. General Management plan preparation

Once the area is delineated and established as a legally recognized community conservation area, a general management plan for the future of the area is very important. This plan should be developed based on participatory approach and will have different component management programs designed for implementation. It may include management programs like sustainable natural resource management, community outreach, sustainable development, tourism management, ecological management, settlement management, community conservation area operation, etc.

8.4. Provision of development programs

The preparation of the general management plan and its implementation will be expected within 2 to 3 years. These management programs will help to address different issues of the community.

- Look for possible alternative solutions for overgrazing, unwise use of communal land and illegally cultivated and settlement areas.
- Introduction of intensive and improved agricultural technologies that can be applied by subsistence farming.
- Conservation measures should be integrated with participatory and sustainable development with equitable benefit sharing.

- Creating suitable land tenure system that can show quickly defined ownership for communal areas and accountability on improper uses, degradation of land and biodiversity.
- Provide opportunity and consecutive monitoring support to the local community and traditional institutions to develop community by laws that go with the national and regional conservation strategies to conserve natural habitats by their own mode of management.

8.5. Resettlement and compensation

During the full implementation of the General management program, resettlement and compensation will be very important especially in areas where cultivations and villages are found at the hillsides and steep slopes of the mountain. This situation is much worse in Mokish kebele at ‘Rigb washa Got’, Divana kebele along the hillsides of Wanqa River at ‘Ambo Got’ and Akabet kebele at the steep slopes of ‘Aha Got’ in Farta, Misrak Estie and Laygaint woredas respectively. Most of these areas are not suitable for cultivation and settlement. The communities living in these are suffer from absence of water in the dry season (October to February) and low productivity, Irish potato and six row barley being the only crops, which will take longer periods (from march to November) for harvesting. Soil erosion is high and it is a direct result of the past and present agricultural practices on the highlands of the area. High level of livestock population and overgrazing has further caused deforestation, land and water resource degradation. This has caused drought in the highlands and water erosion and siltation in down streams. Resettlement and compensation for the ever-increasing human population of the area, therefore, will be a better solution to conserve the exceptional resource values of mount Guna, including its endangered and endemic fauna and flora, spectacular landscapes and hydrological system, for current and future generations.

9. Major activities to be accomplished

To conserve its naturalness and ecosystem representativeness; develop and utilize its resources sustainably, mount Guna and its environs must be brought to community consevation area system. In doing so it will increase the representative ecosystems of the region from its present status 2% and help to achieve one among the seven protected areas planned in the 5-year strategic plan. Hence, major activities that have to be accomplished are enumerated below:

9.1. Dispatch the study report to other stakeholders and collect comments to finalize the report

- Present the results of this study to other staffs within the Bureau.
- Collect useful comments and suggestions from open discussion and incorporate them in the final report.
- Dispatch the final study reports to other stakeholders to collect further comments and suggestions that should be included

9.2. Zonal Awareness creation workshop and delineation task force establishment

- Carryout awareness creation workshop at Debre Tabor in the presence of different regional, zonal, woreda and kebele stakeholders. ORDA will facilitate the workshop and BoCTPD will present this study report. The outcome the workshop must be to bring mount Guna to Community conservation area system that similar to ‘Menze Guassa Community conservation area’.
- At the end of the workshop delineation task force will be established. The role and responsibilities of the task force are given in Annex 4.

9.3. Mass mobilization and awareness creation

- Create common understanding among the three woredas-Farta, Misrak Estie and Laygaint after discussion at zonal meeting that held on in the presence of the three woredas respective offices (Administrators, Agriculture, EPLAU and CT), zonal respective offices (Administrators, Agriculture, EPLAU and CT) and ORDA.
- After zonal meeting and its consensus, carry out discussion meeting at woreda level in the presence of selective members of the community from each kebele (those participated in menze guassa experience sharing) bordering Guna, woreda respective offices (Administrators, Agriculture, EPLAU and CT), members of the Task force and ORDA Representative. The outcome of this discussion must be:
 - ❖ To reach an agreement to bring mounts Guna to Community conservation area system that similar to ‘Menze Guassa Community conservation area’.

- ❖ An action plan that contains ‘list of strategies’ that can be used to create common understanding within the whole community in each kebele so that they will participate during delineation of Guna.
- Subsequently continuing this discussion meeting at kebele level in the presence of woreda representatives and different groups from the community of each kebele. In addition to the kebele leaders, those people participated in menze guassa experience sharing should work together to convince the community about the importance of delineating mount Guna as community conservation area.
- Once the whole community is convinced about the importance of establishing Mount Guna community conservation area, early preparedness by each kebele before the actual delineation is necessary. In doing so:
 - ❖ Select community representatives that will be a member of the kebele delineation committee
 - ❖ Together with these selected community representatives, carefully identify borders of the kebele with mount Guna. This will reduce the complexity (eg. Unwanted conflict) that will appear during the delineation process.

9.4. Delineation of mount Guna as a Community conservation area

- Select woreda representatives from Administration, CT, EPLAU Offices, Security Affairs and Police that will participate during the processes.
- Establish delineating committee at each kebele levels.
- Delineate the area and propose possible beacons that will be appear the regulation.
- Prepare minute (Kalegubae) for the delineation that contain GPS points and approve it at kebele level.
- Approve the delineation minute (Kalegubae) approved at kebele level with the presence of most members of the woreda cabinet.
- Develop community bylaws by the community themselves that will be incorporated in the regulation document.

9.5. Legal right

- Prepare supportive document to convince the regional council.
- Prepare draft Regulation document that will be approved by the regional council to establish and give legal right for Mount Guna as community conservation area.

9.6. Identify and introduce the roles, efforts and responsibilities of Stake holders

- Identify potential stakeholders which will play active role during delineation, awareness creation campaign, implementation of different development, utilization and management programs.
- Identify the roles and responsibilities of those potential stakeholders (given in Annex 4).
- Create awareness and common understanding among stakeholders about their roles and responsibilities.

Ensure potential stakeholders to accomplish their role and responsibilities.

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List of Annexes

Annex 1. List of plant species found in Mount Guna and its environs

No	Vernacular	Scientific Name	Remarks
1.	<i>Gerar</i>	<i>Acacia abyssinica</i>	
2.	<i>kosheshile</i>	<i>Acanthus senii</i>	endemic
3.	<i>serdo</i>	<i>Agrostis semiverticillata</i>	
4.	<i>Embes</i>	<i>Allophylus abyssinicus</i>	
5.	<i>Ret</i>	<i>Aloe vera</i>	
6.	<i>gajja sar</i>	<i>Andropogon squamulatus</i>	
7.	<i>Dong</i>	<i>Apodytes dimidiata</i>	
8.	<i>Kerkeha</i>	<i>Arundinaria alpine</i>	
9.	<i>Shembeko</i>	<i>Arundo donax</i>	
10.	<i>Yeset kest</i>	<i>Asparagus africanus</i>	
11.	<i>Anfar</i>	<i>Buddleja polystachya</i>	
12.	<i>Zigta</i>	<i>Calpurnia aurea</i>	
13.	<i>Gumero</i>	<i>Capparis tomentosa</i>	
14.	<i>Yahya eshoh</i>	<i>Carduus ellenbeckii</i>	
15.	<i>Agam</i>	<i>carissa edulis</i>	
16.	<i>Tree lucern</i>	<i>Chamaecytisus palmensis</i>	
17.	<i>Misrch</i>	<i>Clerodendrom myricoides</i>	
18.	<i>Fiyelefeji</i>	<i>Clutia abyssinica</i>	
19.	<i>Avalo</i>	<i>Combretum molle</i>	
20.	<i>Wanza</i>	<i>Cordia Africana</i>	
21.	<i>Getin</i>	<i>Crepis spp.</i>	
22.	<i>Bisana</i>	<i>Croton macrostachyus</i>	
23.	<i>Yeferenj Tid</i>	<i>Cupressus lusitanica</i>	
24.	<i>Yemidr koso</i>	<i>Delipinium dasycaulon</i>	
25.	<i>Almiti/aluma</i>	<i>Discopodium penninervum</i>	
26.	<i>Keteketa</i>	<i>Dodonaea viscosa</i>	
27.	<i>Wulkifa</i>	<i>Dombeya torrida</i>	
28.	<i>Koshim</i>	<i>Dovyalis abyssinica</i>	
29.	<i>Guale/kosheshil</i>	<i>Echinops ellenbeckii</i>	endemic
30.	<i>Dendero</i>	<i>Echinops giganteus</i>	
31.	<i>Sembo/Lol</i>	<i>Ekebergia capensis</i>	
32.	<i>Kentefa/qontir</i>	<i>Entada abyssinica</i>	
33.	<i>Asta</i>	<i>Erica arborea</i>	
34.	<i>Nech Bahir Zaf</i>	<i>Eucalyptus globules</i>	
35.	<i>Dedeho</i>	<i>Euclea schimperii</i>	

No	Vernacular	Scientific Name	Remarks
36.	<i>qulqual</i>	<i>Euphorbia candelabrum</i>	
37.	<i>Nechi</i>	<i>Festuca spp</i>	endemic
38.	<i>Shola</i>	<i>Ficus sur</i>	
39.	<i>Chibha</i>	<i>Ficus thonningii</i>	
40.	<i>Warka</i>	<i>Ficus vasta</i>	
41.	<i>Ashekit</i>	<i>Gaium asparinides</i>	
42.	<i>Kosso</i>	<i>Hagenia abyssinica</i>	
43.	<i>Nech</i>	<i>Helichrysum citrispinum</i>	
44.	<i>Nechilo</i>	<i>Helichrysum hochstetteri</i>	endemic
45.	<i>Ydimet ayn/adyo</i>	<i>Helichrysum spp.</i>	
46.	<i>Yetija/yembosa</i>	<i>Hibiscus micranthus</i>	
47.	<i>Amja</i>	<i>Hypericum revolutum</i>	
48.	<i>Tembele</i>	<i>Jasminum abyssinicum</i>	
49.	<i>Yehabesha Tid</i>	<i>Juniperus procera</i>	
50.	<i>Sensel</i>	<i>Justicia schimperiana</i>	
51.	<i>Andahula</i>	<i>Kalanchoe petitiiana</i>	
52.	<i>Ashenda</i>	<i>Kniphofia foliosa</i>	endemic
53.	<i>Kese</i>	<i>Laggara tomentosa</i>	
54.	<i>Yfrse zeng</i>	<i>Leonotis velutina</i>	
55.	<i>Jibera</i>	<i>Lobelia rynchopetalum</i>	endemic
56.	<i>Shenet</i>	<i>Myrica salicifolia</i>	
57.	<i>Kechemo</i>	<i>Myrsine Africana</i>	
58.	<i>Kumbel</i>	<i>Mytenus arbutifolia</i>	
59.	<i>Atat</i>	<i>Mytenus ovatus</i>	
60.	<i>Asquar</i>	<i>Nuxia congesta</i>	
61.	<i>Mut</i>	<i>Ocimum suave</i>	Medicinal
62.	<i>Woyira</i>	<i>Olea europaea</i>	
63.	<i>Tefie</i>	<i>Olinia rochetiana</i>	
64.	<i>Keret</i>	<i>Osyris quadripartite</i>	
65.	<i>Tinjut</i>	<i>Otostegia fruticosa</i>	
66.	<i>Woynagft</i>	<i>Pentas schimperana</i>	
67.	<i>Indod</i>	<i>Phytolacca dodecandra</i>	
68.	<i>Zegeba</i>	<i>Podocarpus falcatus</i>	
69.	<i>Tikure Inchet</i>	<i>Prunus africanus</i>	
70.	<i>Gesho</i>	<i>Rhamnus prinoides</i>	
71.	<i>Shibta/ilem</i>	<i>Rhus retinorrhoea</i>	
72.	<i>Qammo</i>	<i>Rhus vulgaris</i>	
73.	<i>Kega</i>	<i>Rosa abyssinica</i>	
74.	<i>Tsigiereda</i>	<i>Rosa abyssinica</i>	

No	Vernacular	Scientific Name	Remarks
75.	<i>Enjory</i>	<i>Rubus apetalus</i>	
76.	Mekmeko	<i>Rumex abyssinicus</i>	
77.	<i>Tult</i>	<i>Rumex nepalensis</i>	
78.	<i>Embuacho</i>	<i>Rumex nervusus</i>	
79.	Shushuni/kaya	<i>Salix subserrata</i>	
80.	Getem	<i>Schefflera abyssinica</i>	
81.	Sihil	<i>Schrebera alata</i>	
82.	<i>Chifreg</i>	<i>Sedum spp</i>	
83.	<i>Yeshikoko</i>	<i>Solanecio gigas</i>	
84.	embuay	<i>Solanum gigantum</i>	
85.	<i>Embuay</i>	<i>Solanum marginatum</i>	
86.	<i>Tosign</i>	<i>Thymus schimperi</i>	
87.	<i>Filla</i>	<i>Typha angustifolia</i>	
88.	Berie milas	Unidentified	Herb
89.	Dinba/zkakibe	Unidentified	Herb
90.	Herb	Unidentified	Grass
91.	Wofshola	Unidentified	Herb
92.	Ykebero jirat	Unidentified	Herb
93.	Ymdir eshoh	Unidentified	Herb
94.	Yrgo filaki	Unidentified	Herb
95.	<i>Lankuso</i>	<i>Urera hypselodendron</i>	
96.	<i>Sama</i>	<i>Urtica simensis</i>	

Annex 2. List of mammal species found in Mount Guna and its environs

No	Order	Family	Common Name	Scientific Name	Conservation Status
	Artiodactyla	Bovidae	Klipspringer	<i>Oreotragus oreotragus</i>	A, B, LR/cd
			Common Duiker	<i>Sylvicapra grimmia</i>	A, B, LR/lc
	Carnivores	Canidae	Golden/ Common/ Jackal	<i>Canis aureus</i>	A, B, LR/lc
			Black-backed jackal	<i>Canis mesomelas</i>	B, LR/lc
			Ethiopian Wolf	<i>Canis simensis</i>	A, B, C,E, EN
		Felidae	Caracal	<i>Caracal caracal</i>	B, LR/lc
			Wildcat	<i>Felis silvestris lybica</i>	A, B, LR/lc
			Serval	<i>Leptailurus serval</i>	B, LR/lc
			Leopard	<i>Panther pardus</i>	B, LR/lc
		Herpestidae	Spotted Hyena	<i>Crocuta crocuta</i>	A, B, LR/cd
			Common Dwarf Mongoose	<i>Helogale parvula</i>	A, B, LR/lc
			Striped Hyena	<i>Hyaena hyaena</i>	A, B, LR/nt

No	Order	Family	Common Name	Scientific Name	Conservation Status
		Mustelidae	Ratel	<i>Mellivora capensis</i>	A, B, LR/lc
		Viverridae	African civet	<i>Civettictis civetta</i>	B, LR/lc
			Abyssinian genet	<i>Genetta abyssinica</i>	B, DD
	Hyracoidea	Procaviidae	Rock Hyrax	<i>Heterohyrax brucei</i>	A, B, LR/lc
		Cercopithecidae	Vervet Monkey	<i>Cercopithecus aethiops</i>	A, B, LR/lc
	Primates		Olive baboon	<i>Papio anubis</i>	B, LR/cd
			Gelada baboon	<i>Theropithecus gelada</i>	A, B, E, LR/nt
	Lagomorpha	Leporidae	Abyssinian Hare	<i>Lepus habessinicus</i>	A, B, LR/lc
			Ethiopian Highland hare	<i>Lepus starcki</i>	A, B, E, LR/lc
	Soricomorpha	Soricidae	Bailey's shrew	<i>Crocidura baileyi</i>	A, E, LR/lc
	Rodents	Hystricidae	Crested Porcupine	<i>Hystrix cristata</i>	A, B, LR/lc
		Muridae	Abyssinian grass rat	<i>Arvicanthis abyssinicus</i>	A, E, B, LR/lc
			Common home Rat	<i>Arvicanthis Spp</i>	A, B, LR/lc
			Harrington's Rat	<i>Desmomys harringtoni</i>	A, LR/lc
			Harsh-furred rat	<i>Lophuromys flavopunctatus</i>	A, LR/lc
			White-footed rat	<i>Stenocephalemys albipes</i>	A, E, LR/lc
		Spalacidae	common mole rat	<i>Tachyoryctes splendens</i>	A, B, LR/lc
	Tubulidentata	Orycteropodidae	Aardvark	<i>Orycteropus afer</i>	A, B, LR/lc

Note: A= Reported in 2010 by Abraham Marye, B=Observation during the fieldwork (2012), C= Recent observation by locals, T=Threatened (CR=Critically Endangered, EN=Endangered, VU=Vulnerable and NT=Near Threatened), LC=Least Concern, DD=Data Deficient, LR/cd=Lower Risk/conservation dependent, LR/nt=Lower Risk/near threatened, LR/lc=Lower Risk/least concern, E=Endemic to Ethiopia

Annex 3. List of bird species found in Mount Guna and its environs

No	Family	Common Name	Scientific Name	Conservation
	Accipitriformes			
1.	Accipitridae	Black goshawk	<i>Accipiter melanocleucus</i>	B
2.		African little sparrowhawk	<i>Accipiter minullus</i>	A,
3.		Rufous-chested	<i>Accipiter rufiventris</i>	A, B
4.		African goshawk	<i>Accipiter tachiro</i>	B
5.		Greater spotted eagle	<i>Aquila clanga</i>	B, VU
6.		Steppe eagle	<i>Aquila nipalensis</i>	B
7.		Lesser spotted eagle	<i>Aquila pomarina</i>	B
8.		Tawny eagle	<i>Aquila rapox</i>	A, B
9.		Augur buzzard	<i>Bueto rufofuscus</i>	A, B
10.		Common buzzard	<i>Buteo buteo</i>	B
11.		Lammergeier	<i>Gypaetus barbatus</i>	A, B
12.		Rüppell's Vulture	<i>Gyps rueppellii</i>	A, T
13.		Black kit	<i>Milvus migrans</i>	A, B

No	Family	Common Name	Scientific Name	Conservation
14.		Hooded vulture	<i>Necrosyrtes monachus</i>	A, B
15.		Egyptian vulture	<i>Neophron percnopterus</i>	A, B
Strigiformes				
16.	Tytonidae	Barn owl	<i>Tyto alba</i>	A
Coraciiformes				
17.	Alcedinidae	Pied Kingfisher	<i>Ceryle rudis</i>	A
18.		Malachite kingfisher	<i>Corythornis cristata</i>	A
19.	Bucerotidae	Abyssinian ground hornbill	<i>Bucorvus abyssinicus</i>	C
20.		Silvery-cheeked hornbill	<i>Ceratogymna brevis</i>	C
21.		Hemprich's hornbill	<i>Tockus hemprichii</i>	B, BR3
22.	Meropidae	Red throated bee-eater	<i>Merops bullocki</i>	A, B, BR2
23.		Carmine bee-eater	<i>Merops nubicus</i>	A
24.		Little bee-eater	<i>Merops pusillus</i>	A, B
25.	Phoeniculidae	Green-wood-hoopoe	<i>Phoeniculus purpureus</i>	A
26.	Upupidae	African Hoopoe	<i>Upupa epops africana</i>	A
Anseriformes				
27.	Anatidae	Egyptian goose	<i>Alopchen aegyptiaca</i>	A, B
28.		Blue-winged goose	<i>Cyanochen cyanopterus</i>	A, [E], BR1, NT
Apodiformes				
29.	Apodidae	Little swift	<i>Apus affinis</i>	A
30.		White-rumped swift	<i>Apus caffer</i>	A
31.		Scarce swift	<i>Schoutedenapus myoptilus</i>	A, BR1
Pelecaniformes				
32.	Ardeidae	Grey heron	<i>Ardea cinerea</i>	A, B
33.		Black-headed heron	<i>Ardea melanocephala</i>	B
34.		Cattle egret	<i>Ardeola ibis</i>	A
35.	Scopidae	Hamerkop	<i>Scopus umbretta</i>	A, B
36.	Threskiornithidae	Wattled ibis	<i>Bostrychia carunculata</i>	B, [E], BR1
37.		Hadad ibis	<i>Hagedashia hagedash</i>	A,B
Charadriiformes				
38.	Charadriidae	Black-headed lapwing	<i>Vanellus tectus</i>	A
39.		Spot-breasted lapwing	<i>Vanellus melanocephalus</i>	A, E, BR1
40.		Spur-winged plover	<i>Vanellus spinosus</i>	A
41.	Jacanidae	Lesser jacana	<i>Microparra capensis</i>	A
42.	Recurvirostridae	Black-winged stilt	<i>Himantopus himantopus</i>	A
Coliiformes				
43.	Coliidae	Speckled mousebird	<i>Colius striatus</i>	B
44.		White-headed mousebird	<i>Colius leucocephalus</i>	A, B
Piciformes				
45.	Lybiidae	Blackbilled barbet	<i>Lybius guifsobalito</i>	A
46.		Double-toothed barbet	<i>Lybius bidentatus</i>	A
Cuculiformes				
47.	Musophagidae	White-cheeked turaco	<i>Tauraco leucotis</i>	B, BR1

No	Family	Common Name	Scientific Name	Conservation
	Galliformes			
48.	Phasianidae	Erckel's francolin	<i>Francolinus erckelii</i>	C, BR1
49.		Moorland francolin	<i>Francolinus psilolaemus</i>	A, BR1
50.		Scaly francolin	<i>Francolinus squamatus</i>	C
	Columbiformes			
51.	Columbidae	White collared pigeon	<i>Columba albitorques</i>	A, B, [E], BR1,
52.		Speckled pigeon	<i>Columba guinea</i>	A, B
53.		Ring-necked dove	<i>Streptopelia capicola</i>	A, B
54.		Dusky turtle dove	<i>Streptopelia lugens</i>	A, B, RB1
55.		Red-eyed dove	<i>Streptopelia semitoquata</i>	A, B
	Psittaciformes			
56.	Psittacidae	Black-winged lovebird	<i>Agapornis taranta</i>	A, [E], BR1
57.		Red-fronted parrot	<i>Poicephalus gulielmi</i>	A
	Passeriformes			
58.	Alaudidae	Red-capped lark	<i>Calandrella cinerea</i>	A
59.		Thekla lark	<i>Galerida theklae</i>	B
60.	Buphagidae	Red-billed oxpecker	<i>Buphagus</i>	A, B
61.		Yellow-billed oxpecker	<i>Buphagus africanus</i>	A, B
62.	Cisticolidae	Tawny-flanked prinia	<i>Prinia subflava</i>	B
63.	Corvidae	Pied crow	<i>Corvus albus</i>	A, B
64.		Cape rock	<i>Corvus capensis</i>	A, B
65.		Thick-billed raven	<i>Corvus crassirostris</i>	A, B, [E], BR1
66.		Fan-tailed raven	<i>Corvus rhipidurus</i>	A, B
67.		Red-billed Chough	<i>Pyrrhocorax pyrrhocorax</i>	A
68.	Emberizidae	Brown-rumped bunting	<i>Emberiza affinis</i>	A
69.		Golden-breasted bunting	<i>Emberiza flaviventris</i>	A
70.	Estrildidae	Abyssinian crimson-wing	<i>Cryptospiza salvadorii</i>	A, BR1
71.		Yellow-bellied waxbill	<i>Estrilda melanotis</i>	A
72.		Black-faced firefinch	<i>Lagonostica vinacea</i>	A, BR2
73.		African firefinch	<i>Lagonosticta rubricate</i>	B
74.		Red-billed firefinch	<i>Lagonosticta senegala</i>	B
75.		Red-checked Gordon blue	<i>Uraeginthus bengalus</i>	B
76.	Fringillidae	Ankober serin	<i>Serinus ankoberensis</i>	A, B, E, BR1, EN
77.		African citril	<i>Serinus citrinelloides</i>	A, BR1
78.		Yellow-crowned canary	<i>Serinus flavivertex</i>	B
79.		Black-headed siskin	<i>Serinus nigriceps</i>	A, B, E, BR1
80.		Reichard's seedeater	<i>Serinus reichardi</i>	B
81.		Streaky seedeater	<i>Serinus striolatus</i>	A, B, BR1
82.		Brown-rumped serin	<i>Serinus tristriatus</i>	A, B, BR1
83.		Yellow rumped serin	<i>Serinus xanthopygius</i>	A, B
84.	Hirundinidae	Red-rumped Swallow	<i>Cecropis daurica</i>	A
85.		Ethiopian Swallow	<i>Hirundo aethiopica</i>	A
86.		Crag martin	<i>Hirundo rupestris</i>	A, B

No	Family	Common Name	Scientific Name	Conservation
87.	Laniidae	Common fiscal	<i>Lanius collaris</i>	B
88.	Monarchidae	African paradise-flycatcher	<i>Terpsiphone viridis</i>	A,
89.	Motacillidae	Abyssinian long claw	<i>Macronyx flavicollis</i>	A, B, E, BR1, NT
90.		Mountain wagtail	<i>Motacilla clara</i>	A, B
91.		Yellow wagtail	<i>Motacilla flava</i>	B
92.	Muscicapidae	African Grey flycatcher	<i>Bradornis microrhynchus</i>	B, BR3
93.		Alpine /moorland chat	<i>Cercomela sordida</i>	B, BR1
94.		Rueppell's robin chat	<i>Cossypha semirufa</i>	A, BR1
95.		Silverbird	<i>Empidonis semipartitus</i>	A
96.		Abyssinian slaty-flycatcher	<i>Melaenornis chocolatinus</i>	B, BR1
97.		Northern black-flycatcher	<i>Melaenornis edolioides</i>	A
98.		Gray-tit flycatcher	<i>Myioparus plumbeus</i>	B
99.		Ruppell's Black Chat	<i>Myrmecocichla melaena</i>	B, [E], BR1
100.		White-winged cliff-chat	<i>Myrmecocichla semirufa</i>	A,B, [E], BR1
101.		Black-eared whateater	<i>Oenanthe hispanica</i>	B
102.	Nectariniidae	Variable sunbird	<i>Cinnyris venustus</i>	B
103.		Tacazze sunbird	<i>Nectarinia tacazze</i>	A, B, BR1
104.	Passeridae	Pale rockfinch	<i>Carospiza brachydactyla</i>	A
105.		Grey-headed sparrow	<i>Passer griseus</i>	A, B
106.		Swainson's sparrow	<i>Passer swainsonii</i>	A, B, BR1
107.		Yellow-spotted petronia	<i>Petronia pyrgita</i>	A, B
108.	Ploceidae	Red collard widowbird	<i>Euplectes ardens</i>	B
109.		Yellow bishop	<i>Euplectes capensis</i>	B
110.		Orange bishop	<i>Euplectes franciscanus</i>	A
111.		Black-winged red bishop	<i>Euplectes hordeaceus</i>	A, B
112.		Yellow-shouldered	<i>Euplectes macrourus</i>	B
113.		Red bishop	<i>Euplectes orix</i>	A, B
114.		Compact weaver	<i>Pachyphantes</i>	B
115.		Baglafaecht weaver	<i>Ploceus baglafaecht</i>	A, BR1
116.		Palm golden weaver	<i>Ploceus bojeri</i>	A, BR3
117.		Black-headed weaver	<i>Ploceus cucullatus</i>	A, B
118.		Salvadori's weaver	<i>Ploceus dichrocephalus</i>	A, BR3
119.		Little weaver	<i>Ploceus luteolus</i>	A, B
120.		Black-necked weaver	<i>Ploceus nigricollis</i>	A
121.		Rueppell's weaver	<i>Ploecus galbula</i>	A, B, BR3
122.		Grey-headed social weaver	<i>Pseudonigrita arnaudi</i>	A
123.		Speckle-fronted weaver	<i>Sporopipes frontalis</i>	A, B
124.	Pycnonotidae	Yellow-throated greenbul	<i>Chlorocichla flavicollis</i>	A
125.		Common bulbul	<i>Pycnonotus barbatus</i>	A, B
126.	Sturnidae	Long-tailed glossy starling	<i>Lamprotornis caudatus</i>	A
127.		Greater Blue-eared glossy	<i>Lamprotornis chalyhaeus</i>	B
128.		Rueppell's glossy starling	<i>Lamprotornis</i>	A, B
129.		Splendid glossy starling	<i>Lamprotornis splendidus</i>	A, B

No	Family	Common Name	Scientific Name	Conservation
130.		White-billed starling	<i>Onychognathus albirostris</i>	B, [E], BR1
131.		Red winged starling	<i>Onychognathus morio</i>	A, B
132.	Sylviidae	Abyssinian catbird	<i>Parophasma galinieri</i>	B, E, BR1
133.	Turdidae	Ground scraper thrush	<i>Psophocichla litsitsirupa</i>	B
134.		Olive thrush	<i>Turdus olivaceus</i>	A
135.		African thrush	<i>Turdus pelios</i>	A
136.		Abyssinian ground thrush	<i>Zoothera piaggiae</i>	A, B, BR1
137.	Viduidae	Parasitic/cuckoo weaver	<i>Anomalospiza imberbis</i>	A
138.		Village indigobird	<i>Vidua chalybeate</i>	A, B
139.		Pale-winged indigobird	<i>Vidua wilsoni</i>	A

Note: A= Reported in 2010 by Abraham Marye, B=Observation during the fieldwork (2012), C= Recent observation by locals, T=Threatened (CR=Critically Endangered, EN=Endangered, VU=Vulnerable and NT=Near Threatened), E=Endemic to Ethiopia, [E]=Endemic to Ethiopian and Eretria, BR1= Afrotropical Highland Biome Restricted species, BR2= Sudan-Guinea Savanna Biome Restricted species, BR3= Somali-Masai Biome Restricted species

Annex 4. Stake holders Roles and responsibilities

Name of Organization/Stakeholder	Roles and Responsibilities
Amhara National Regional State/Administration	<ul style="list-style-type: none"> • Lead the awareness creation workshop that will be held at Debre Tabor to bring different stakeholders together. Task force will be established and assignments concerning the delineation of mount Guna will be given to the task force. • Monitor the progress of the task force through south Gondar administration offices. • Approve the regulation document provided to the regional council to establish and give legal recognition for mount Guna as a community conservation area. • Provide logistic and skilled human power support to the community conservation area management office that will be established based on Civil Service Bureau permission.
Bureau of Culture, Tourism and Parks Development	<ul style="list-style-type: none"> • Present the results of this study to other staffs within the Bureau. • Collect useful comments and suggestions from open discussion and incorporate them in the final report. • Dispatch the final study reports to other stakeholders to collect further comments and suggestions that should be included. • Create awareness among other stakeholders to prevent extra habitat loss before delineation due to lack of proper protection and monitoring of the study area. • Coordinate the delineation work with task force, ORDA and other stakeholders. • Actively participate and play a major role in establishing mount Guna and its environs as a legally recognized community conservation area: <ul style="list-style-type: none"> ○ Prepare supportive document to convince the regional council. ○ Prepare draft Regulation document that will be approved by the regional council to establish and give legal right for Mount Guna. • Carryout further study, coordinate and monitor other studies in the area. • Following the approval of the draft regulation document area by the regional council, the following major activities are expected to accomplished: <ul style="list-style-type: none"> ○ Introducing the regulation document and the establishment of Guna community conservation area and its legal recognition (carryout workshop in collaboration with ORDA). ○ Propose Guna community conservation area management office. ○ Prepare draft document for human power and logistic support and submit it to Bureau of Civil Service for approval.

Name of Organization/Stakeholder	Roles and Responsibilities
	<ul style="list-style-type: none"> ○ Open management office in appropriate place and employing experts based on the approved document and logistics.
Organization for Rehabilitation and Development in Amhara	<ul style="list-style-type: none"> ● Organize the zonal awareness workshop that will be held in Debre Tabor to: <ul style="list-style-type: none"> ○ Create common understanding among different stakeholders ○ Establish task force which is responsible for delineation of mount Guna. ● Provide logistic and technical support for the Task force. ● Coordinate and actively participate at woreda and kebele level discussion meetings during convincing the community to delineate mount Guna. ● Coordinate the delineation work with BoCTPD, EPLAU and other stakeholders. ● Organize zonal workshop in collaboration with BoCTPD for introducing the regulation document and the establishment of Guna community conservation area and its legal recognition after the approval of the regional council.
South Gondar Zone Administration	<ul style="list-style-type: none"> ● Coordinate together with ORDA the zonal awareness workshop that will be held in Debre Tabor. ● Coordinate and monitor the activity of the task force established for establish mount Guna as a community conservation area. ● Prepare zonal meeting for the respective woreda and zonal stakeholders (Administration, Agriculture, EPLAU and CT) to reach into similar decision; to take assignments; and to implement them at the same time. This in turn will reassure the success of the delineation work. ● Monitor and follow up the subsequent meetings and results of the discussions that will be held at woreda and kebele levels through the task force.
South Gondar Zone Culture and Tourism Branch	<ul style="list-style-type: none"> ● Being the member of the task force as, works together with other member stakeholders towards the implementation of the action plans of the delineation process of mount Guna. ● Participate and coordinate the delineation process. ● Coordinate and facilitate the zonal workshop that will be held in Debre Tabor. ● Documentation and development of tourism potentials near and around mount Guna. ● Facilitate the zonal meeting to create common understanding different partners of the three woredas.
South Gondar Zone Agriculture Branch	<ul style="list-style-type: none"> ● Prevent free grazing. ● Look for possible alternative solutions for overgrazing, unwise use of communal land and illegally cultivated and settlement areas. ● Introduction of intensive and improved agricultural technologies that can be applied by subsistence farming: ● Employee community forest guards until mount Guna is legally established as a community conservation area. ● Provision of plantation for soil and water conservation and for domestic use. ● Assign experts for the task force.
South Gondar Zone Environment protection, Administration and Utilization Branch	<ul style="list-style-type: none"> ● Stop illegal agricultural and settlement expansion to avoid extra habitat loss. ● Assign experts for task force. ● Monitor and follow up the delineation process, evaluate the delineation minute (Kalegubae) both at woreda and kebele level. ● Carryout ecological monitoring study in mount Guna.
South Gondar Zone	<ul style="list-style-type: none"> ● Assign experts for the task force.

Name of Organization/Stakeholder	Roles and Responsibilities
Administration and security affair	<ul style="list-style-type: none"> • Monitor further habitat loss of mount Guna due to illegal activities such as new settlements, cultivation, deforestation, free grazing, etc.
Woreda Administration Offices	<ul style="list-style-type: none"> • Carry out discussion meeting at woreda level in the presence of selective members of the community from each kebele (those participated in menze guassa experience sharing) bordering Guna, woreda respective offices (Administrators, Agriculture, EPLAU and CT), Task force members and ORDA Representative. • Prepare an action plan that contains ‘list of strategies’ that can be used to create common understanding within the whole community in each kebele so that they will participate during delineation of Guna. • Carryout discussion meetings at kebele level in the presence of woreda representatives, task force, ORDA and different groups from the community of each kebele. Those people participated in menze guassa experience sharing should also work together to convince the community. • Coordinate the Early-preparedness by each kebele before the actual delineation work: <ul style="list-style-type: none"> ○ Facilitate the election of community representatives that will be a member of the kebele delineation committee. ○ Coordinate kebele delineation committee to carefully identify the legal borders of the kebele with mount Guna. • Organize the woreda delineation committee from Administration, CT, EPLAU Offices, Security Affairs, BoCTPD experts and Police. • Monitor the delineation process, evaluate and approve the delineation minute (Kalegubae) approved at kebele level with the presence of most members of the woreda cabinet.
Woreda Culture and Tourism offices	<ul style="list-style-type: none"> • Coordinate and facilitate discussion meetings that will be held both at woreda and kebele levels during the delineation process. • Documentation and development of tourism potentials near and around mount Guna. • Participate and coordinate in the delineation process. • Create awareness among the local community to prevent extra habitat loss before delineation due to lack of proper protection and monitoring of the study area. • Assign experts for the delineation work.
Woreda Agriculture offices	<ul style="list-style-type: none"> • Create awareness among the local community to prevent extra habitat loss before delineation due to lack of proper protection and monitoring of the study area. • Minimize if possible prevent free grazing. • Look for possible alternative solutions for overgrazing, unwise use of communal land and illegally cultivated and settlement areas. • Introduction of intensive and improved agricultural technologies that can be applied by subsistence farming: <ul style="list-style-type: none"> ○ Provision of modern and improved animal farming technologies to reduce livestock density/number. • Establish and encourage task forces for forest protection until mount Guna is legally established as a community conservation area. If possible employee community forest guards. • Provision of plantation for soil and water conservation and for domestic use. • Assign experts for the delineation work both at woreda and kebele level.
Woreda Environment protection, Administration and Utilization offices	<ul style="list-style-type: none"> • Create awareness among the local community to prevent extra habitat loss before delineation due to lack of proper protection and monitoring of the study area. • Stop illegal agricultural and settlement expansion to avoid extra habitat loss.

Name of Organization/Stakeholder	Roles and Responsibilities
	<ul style="list-style-type: none"> • Actively participate in discussion meetings at woreda and kebele levels during the delineation process. • Coordinate the Early-preparedness by each kebele before the actual delineation work: <ul style="list-style-type: none"> ○ Facilitate the election of community representatives that will be a member of the kebele delineation committee. ○ Coordinate kebele delineation committee to carefully identify the legal borders of the kebele with mount Guna. ○ Compile data on illegally cultivated lands. • Assign experts for the delineation work both at woreda and kebele level. • Coordinate the delineation process, prepare the delineation minute (Kalegubae) both at woreda and kebele level. • Carryout ecological monitoring study in mount Guna.
Woreda Administration and security affair offices	<ul style="list-style-type: none"> • Provide security protection during the delineation process. • Assign experts from police and militia offices for the delineation work. • Prevent further habitat loss of mount Guna due to illegal activities such as new settlements, cultivation, deforestation, free grazing, etc.
Woreda Justice offices	<ul style="list-style-type: none"> • Create awareness among the local community to avoid illegal practices on the natural resources. • Give proper decision/punishment for illegal acts based on the community bylaws and the approved regulation document for ‘Guna community conservation area’.
Woreda water, mineral and energy offices	<ul style="list-style-type: none"> • Provision of energy saving technologies • Provision of safe water supply for drinking both for the community and their livestock.
Woreda cooperative promoting offices	<ul style="list-style-type: none"> • Assist to establish ecotourism associations for sustainable development of the community and the natural resources.
Debre Tabor University	<ul style="list-style-type: none"> • Carryout ecological monitoring study in mount Guna. • Coordinate the general management plan preparation for mount Guna.
Task force (established after awareness creation workshop with members from various stakeholders)	<ul style="list-style-type: none"> • Coordinate and participate at woreda and kebele level discussion meetings during convincing the community to delineate mount Guna. • Coordinate the delineation of mount Guna towards its establishment as a community conservation area. • Work together with BoCTPD, BoEPLAU, and ORDA experts and serve as a bridge between kebele, woreda and Zonal decision makers and the regional experts. • Monitor and evaluate progress reports of accomplished by woreda and kebele stakeholders and regional experts. • Coordinate the approval of each minute (Kalegubae) prepared and approved at kebele level that will help convincing the regional council in approving the draft regulation to establish Guna as a community conservation area.
Kebele Peasant Associations (15kebeles)	<ul style="list-style-type: none"> • Active participation during discussion meetings and the delineation process. • Select and assign community field guards/scouts for monitoring and protection of the area from illegal acts (cultivation, settlement, free grazing, deforestation, etc).

Name of Organization/Stakeholder	Roles and Responsibilities
	<ul style="list-style-type: none"> Bring those illegal actors to justice.

Annex 5. GPS points for transects

Waypoint	Easting	Northing	Elevation	Remark
001	392 946	1310 934	2672.67 m	Debre Tabor town
002	397 350	1311 808	2550.98 m	Gafat and Yohannes 4 th
003	411 225	1295 156	3660.32 m	Kebero meda
005	413 399	1294 521	3754.24 m	Work- mamesha school
007	414 964	1295 010	3787.56 m	Yemokish Erica wood land
009	415 602	1295 483	3693.23 m	Source of Ribb river
011	414 637	1296 045	3557.21 m	Rigib medhanialem church
014	401 495	1296 144	2567.06 m	Gumara river
015	406 008	1301 505	2871.85 m	Mainet kebele center
016	406 009	1301 505	2871.35 m	Awuzet kebele center
017	417 051	1303 560	3039.55 m	Guna water factory
018	415 092	1305 358	2985.75 m	Kimir Dingay via to wukro medhanialem church
019	411 241	1310 452	2730.82 m	wukro medhanialem church
020	406 375	1303 800	2819.49 m	Gasay via toEstie and Simada
021	396 752	1283 435	2409.06 m	Mekane Eyesus town
022	398 108	1286 120	2406.31 m	Densa mount
023	410 991	1295 251	3629.06 m	Mokish kebele village
024	413 031	1293 529	3609.96 m	Elet Dibana / Ambo village
025	413 919	1291 722	3680.96 m	Kebero habitat
026	414 249	1291 029	3646.76 m	Dat kebele border
027	413 222	1290 966	3772.12 m	Jibb washa
028	422 395	1297 920	3236.96 m	Akabit kebele /aha village
029	417 013	1295 044	4065.84 m	Akabit kebele center
034	417 039	1295 758	4101.83 m	Guna tip/beredo mefiya
037	418 225	1302 321	3098.64 m	Goleye river
039	428 438	1296 700	3133.97 m	Sali town
041	428 343	1292 455	3136.71 m	Zur –Aba church
044	442 280	1297 291	3121.43 m	Nefas mewucha

Annex 6. The mount Guna Population Crop Production Summery in 2004/05 Ethiopian Production years by Kebele and Crop Type

	POTATO		Barely		Wheat		Field Beans		Field Peas		Teff	
	Ha	Qt	Ha	Qt	Ha	Qt	Ha	Qt	Ha	Qt	Ha	Qt
Liwaye Ashama Gedayat	300	39,000	600	24000	700	24500	120	2400	60	900	20	520
Elete Dibana	400	52,000	500	20000	700	24500	180	3600	30	450	6	156
Wichila Basenika	280	36,400	350	14000	350	14500	75	2400	35	525	10	260
Dat Giyorgis	300	39,000.	700	28000	600	21000	120	3600	40	600	10	260
Sub total		166,400		86,000		84,500		12,000.00		2,475.00		1,196.00
Mokish	695	118,150	483	14007	273	9009	197	1500	78	1014		
Sores	653	108,404	450	12150	78	2418	85	2400	70	840		
ARGA DIDIM	745	122,925	200	5400	54	1620	13	143	16	192		
AWZET AZAWUR	697	117,096	365	10200	52	1664	43	516	6	72		
ATADIDIM	495	82,665	425	11900	124	3968	51	612	35	420	56	448
MYNET	520	85,280	262	6812	40	1200	10	110	2	22		
Sub total		634,520		60469		19879		5281		2560		448
Titira \K.04	312	44,304	285	7410	311	9641	11	297	18	198		
Akabit \K.09	271	38,482	411	10686	278	8618	16	432	29	319		
Guna gedeba \K.10	285	40,470	305	7930	300	9300	13	351	71	781		

	POTATO		Barely		Wheat		Field Beans		Field Peas		Teff	
	Ha	Qt	Ha	Qt	Ha	Qt	Ha	Qt	Ha	Qt	Ha	Qt
Guzana shedo \K.11	310	44,020	275	7150	264	8184	25	675	84	924		
Minch wiha \K.12	294	41,748	300	7800	311	9641	19	513	76	836		
Dera kefoye \K.15	291	41,322	401	10426	276	8556	16	432	29	319		
Sub total		250,346.00		51,402.00		53,940.00		2,700.00		3,377.00		-
Total		1,051,266		197,871.00		158,319.00		19,981.00		8,412.00		1,644.

Annex 7. Mount Guna Livestock Population, by type of Animal and Kebele in Number and TLU

Woreda/Kebele	Cattle		Sheep		Goat		Donkey		Mue		Horse	
	No	TLU	No	TLU	No	TLU	No	TLU	No	TLU	No	TLU
Mokish	2,021.00	1,612.56	3,099.00	276.43	257.00	17.99	35.00	12.25	546.00	491.40	487.00	170.45
Sores	2,260.00	1,803.25	2,864.00	255.47	154.00	10.78	28.00	9.80	370.00	333.00	364.00	127.40
ARGA DIDIM	1,899.00	1,515.21	4,713.00	420.40	195.00	13.65	141.00	49.35	116.00	104.40	749.00	262.15
AWZET AZAWUR	2,540.00	2,026.67	4,073.00	363.31	137.00	9.59	76.00	26.60	349.00	314.10	751.00	262.85
ATA DIDIM	2,864.00	2,285.19	5,020.00	447.78	254.00	17.78	274.00	95.90	168.00	151.20	859.00	300.65
MYNET	5,102.00	4,070.89	6,446.00	574.98	556.00	38.92	145.00	50.75	459.00	413.10	983.00	344.05
Sub Total	16,686.00	13,313.76	26,215.00	2,338.38	1,553.00	108.71	699.00	244.65	2,008.00	1,807.20	4,193.00	1,467.55
Liwaye Ashama Gedayat	5,490.00	4,380.47	4,676.00	417.10	347.00	24.29	368.00	128.80	1,110.00	999.00	210.00	73.50

Elete Dibana	8,596.00	6,858.75	7,206.00	642.78	243.00	17.01	420.00	147.00	700.00	630.00	600.00	210.00
Wichila Basenika	4,085.00	3,259.42	6,000.00	535.20	600.00	42.00	446.00	156.10	206.00	185.40	412.00	144.20
Dat Giyorgis	8,755.00	6,985.61	4,398.00	392.30	1,270.00	88.90	578.00	202.30	8,254.00	7,428.60	218.00	76.30
Sub Total	26,926.00	21,484.26	22,280.00	1,987.38	2,460.00	172.20	1,812.00	634.20	10,270.00	9,243.00	1,440.00	504.00
Titira \K.04	4,457.00	3,556.24	3,550.00	316.66	176.00	12.32	803.00	281.05	50.00	45.00	540.00	189.00
Akabit \K.09	3,571.00	2,849.30	5,240.00	467.41	236.00	16.52	657.00	229.95	68.00	61.20	365.00	127.75
Guna gedeba \K.10	3,338.00	2,663.39	7,313.00	652.32	238.00	16.66	491.00	171.85	23.00	20.70	387.00	135.45
Guzana shedo \K.11	4,764.00	3,801.20	7,211.00	643.22	612.00	42.84	897.00	313.95	47.00	42.30	417.00	145.95
Minch wiha \K.12	3,996.00	3,188.41	4,986.00	444.75	2,592.00	181.44	598.00	209.30	23.00	20.70	65.00	22.75
Dera kefoye \K.15	2,841.00	2,266.83	3,171.00	282.85	786.00	55.02	478.00	167.30	137.00	123.30	131.00	45.85
Sub Total	22,967.00	18,325.37	31,471.00	2,807.21	4,640.00	324.80	3,924.00	1,373.40	348.00	313.20	1,905.00	666.75
total	66,579.00	53,123.38	79,966.00	7,132.97	8,653.00	605.71	6,435.00	2,252.25	12,626.00	11,363.40	7,538.00	2,638.30

Annex 8. Focus Group Discussion Checklist (Trend Analysis)

1. How did the Biodiversity and local livelihoods change over time?

- *To understand the ongoing trends of habitat change in the G. highlands, namely land conversion to agriculture, natural resource uses and access, to predict their effects /risk for the community wellbeing and biodiversity wellbeing.*
- *Local people's attitudes and Perceptions on the degradation of the resource,*

2. How do traditional community livelihoods look like?

- *To identify basic economic and social activities (threads) of the local livelihoods, in terms of employment and means of earning for the wellbeing.*
- *People's dependence on Afroalpine habitats for firewood and pastures.*
- *problem settings of livelihoods;*
- *The opportunity and hurdles of the agro-ecology for the community food production, this includes*
 - *their farm plot quality and productivity,*
 - *pasture availability, access and sufficiency for livestock production,*
- *How people utilize the land, manipulation of natural ecosystem in order to obtain benefits, which could be material benefits/products (e.g cereals production, livestock purpose) and immaterial benefits (erosion prevention) and socio economic activity (inputs, managements and out puts).*

3. Perception and attitudes of the local people's in response to the rehabilitation, conservation and Sustainable utilization of natural resources in mount Guna and its environs.