

Project Update: November 2018

Ethnomedical Research MGGT

Background of the study

Human life is not complete in the absence of plant role, because plants have been an integral part of human society since the start of civilization. Since the beginning of civilization, people have used plants as medicine, food, furniture, dye, source of income etc. (Farnsworth *et al.*, 1991, Shah, 2005). Because of long history linkage between humans and plants a science so called is develop to investigate the utilization of plants for a wide variety of humans needs such as medicine, food, fodder, fiber, and goods required for their material culture and amenities (Cotton, 1996).

Plants have traditionally been used as a source of medicine in Ethiopia since early times for the control of various ailments afflicting humans and their domestic animals. Even the traditional medicinal plants has significant role of in supporting Ethiopian societies as national primary healthcare for human and livestock, it is not investigated, documented and promoted as extensively their importance (Mirutse Giday and Gobena Ameni, 2003). If these plants are not conserved and the associated ethno medicinal knowledge is not documented, the volubility and sustainability medicinal plant will be fall in risk and may vanish perpetually. As it is happening elsewhere in the country, medicinal plants of around Hirmi forest of northwest zone of Tigray region are facing various anthropogenic and environmental risks. Hence this study will investigate diversity, management mechanisms and identify the major risks to implement appropriate documentation and conservation measures of the medicinal plants in the study area.

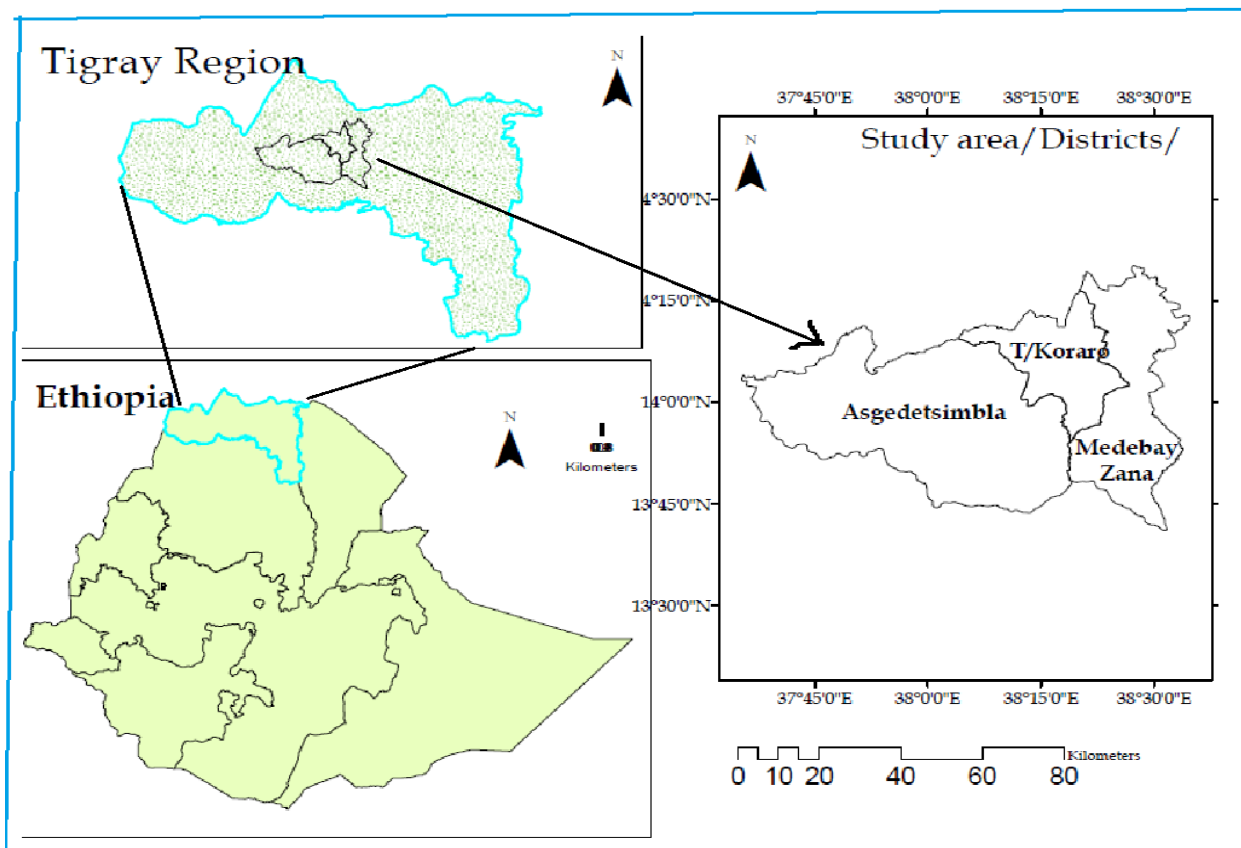


Figure 1: Map of the study area (Hirmi)

Months	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean temperature /month(°c)	35	34.5	33.5	32	23.5	19	16	14	17.5	18.5	21	28
Mean rainfall/ month(mm)	720	732	744	765	990	1016	1334	1400	1121	988	836	758

Glimpse of the study area Biodiversity

1. Agriculture

Agriculture is the mainstay of the economy in the study area. Very few people are leading their life by livestock reproduction. Agroforestry is dominantly observed in their backyard and the nearby farmland. *Eleusine coracana*, *Eragrostis tef*, *Sorghum bicolor*, *Zea mays* L., *Pennisetum glaucum*, *Cicer arietinum*, *Hordeum vulgare*, and *Linum usitatissimum* are the most common and important crops cultivated in the study area. Livestock are also common in the study area. In Hirmi forest area, different type of vegetation cover exists. In most of the upper course steep valley side, dense forests are concentrated and on the gently slope dense and sparse shrub lands dominantly covering. Most of the flat areas are covered by agricultural crops. Based on my observation and personal communication with local farmers, expansion agricultural expansion, resettlement and decreasing of forest cover is increasing in the study area. These factors will be the main future challenges of the forest sustainability.

2. Vegetation

The vegetation type of Hirmi is characterised as *Acacia-Comiphora* woodland and *Combretum-Terminalia* wood land type. In most of the upper course steep valley side, dense forests are concentrated and on the gently slope dense and sparse shrub lands dominantly covering. The forest was densely stocked natural forest in the 1960s with various types of tree species like *Oxythenanthera abyssinica* A. Rich., *Ziziphus* spp, *Terminalia*, *Combretum*, *Diospyrous* spp, *Boswellia* spp, *Albiza* spp, *Eucleaspp*, *Ficus* spp, *Acacia polyacantha* Hochst., *A.lahai* Steud., *Acacia nilotica* Del., *A. abyssinica* Hochst., etc.



Figure 2: Vegetation of study area in partial

Ethnobotanical study:

Currently a total of 6 kebele (50 % of the study Kebeles) were selected purposively by giving priority for those Kebeles closest to forest. Around 50% of Hirmi forest is situated in Tahtay Koraro woreda, the rest portion is found in Medebay Zana woreda (about 28%) and Asgedetsimbla Woreda (about 22%) (North West Zone of Tigray region, Agriculture and rural development office, 2017).

In the selected six Kebeles 4,868 householders with total population of 34,080 were exist. Based on the proportion the populations found in each selected local administrations, a total of 370 informants were selected using Cochran's (1977) formula as follows:

$$n = \frac{N}{1+N(e)^2}$$
 Where, n=sample size; e = maximum variability or margin of error 5% (0.05); N= total number of households in all 6 kebeles (i.e. 4,868).

Scope interview to ward Ethnobotanical conservation:

The scope of the questionnaires for general informants were on a) respondents background b) perception of respondents on the forest management such as the importance of Hirmi forest, the most important species in their locality, environmental changes revealed in their environment, destructive conditions for the forest, the most treated species, status of forest/plants in their locality, c) informants related to knowledge of informants on traditional medicinal plant's name, part used, habit, source (wild/cultivated), abundance, condition of plant part used (fresh/dried), mood preparation, administration/dosage, traditional conservation practices of medicinal plants, disease treated and other use of the medicinal plant. After interviewing, one focus group discussion was implemented in each kebele with 8-10 informants for further information and reliability of the collected data through semi-structured interviews as recommended by Alexiades (1996); Cotton (1996). Moreover, it was helpful to conduct voucher specimen collection by means of identifying of their local name with the help of the informants and local field assistants.



Based on these more than 81 herbal plants to treat human alignment and 27 species used to livestock disease. Out of those; 25.9% of them were herb, 22.2% tree, 44.4% shrub, and 7.4% woody climber. Based on the family analysis, High number of family Fabaceae 7(15.2%), Boraginaceae, Euphorbiaceae 6(13%), Lamiaceae 3 (6%), Asteraceae 3(6%), Solanaceae3(6%), Cucurbitaceae3(6%) are the major families in the present study. The detail is here in the table below

Table 1: Ratio of all plant families in the study area

SN	Family	No. spp	SN	Family	No. spp
1	Acanthaceae	1	25	Hyacinthaceae	1
2	Apocynaceae	2	26	Lamiaceae	4
3	Alliaceae	1	27	Lauraceae	1
4	Aloaceae	1	28	Meliaceae	1
5	Anacardiaceae	1	29	Myrtaceae	1
6	Apiaceae	1	30	Malvaceae	1
7	Asteraceae	3	31	Moringaceae	1
8	Agavaceae	1	31	Olacaceae	1
9	Amaranthaceae	2	33	Oleaceae	2
10	Asclepiadaceae	1	34	Phytolaccaceae	1
11	Asphodelaceae	1	35	Polygonaceae	2
12	Burseraceae	1	36	Plumbaginaceae	1
13	Brassicaceae	1	37	Phyllanthaceae	1
14	Boragenaceae	2	38	Rutaceae	2
15	Bombacaceae	1	39	Rubiaceae	2
16	Bignoniaceae	1	40	Rhamnaceae	2
17	Cucurbitaceae	3	41	Scrophulariaceae	2
18	Combretaceae	2	42	Solanaceae	4
19	Celastraceae	2	43	Sapindaceae	1
20	Capparidaceae	1	44	Tiliaceae	1
21	Cactaceae	1	45	Urticaceae	1
22	Euphorbiaceae	6	46	Vitaceae	2
23	Ebenaceae	1	48	Verbenaceae	1
24	Fabaceae	6	49	Zingiberaceae	1

Accordingly there are a total of 81 species belong to 49 families. 99% species used to treat human are also used to treat animal disease.

Table 2: result of the interview to the local peoples

SN	Number of species	No.	SN	Number of family	No.
1	Used to treat both for human & livestock	81	1	Both for human & livestock	49
2	Used to treat only for human	80	2	Used to treat only for human	47
3	Used to treat only for animal	27	3	Used to treat only for animal	22
4	Difference	1	4	Difference	0

Table 3: most human disease revealed in the community

Sn	Inquiry	Response	No. (%)
		Medicine	60(16.2%)
		Fodder	54(14.6%)
		Firewood	48(13%)
		Furniture	42(11.4%)
		Charcoal	34(9.2%)
		Construction	34(9.2%)
		Food	33(8.9%)
		Beekeeping	27(9.3%)
		Others (fence, sanitation, source of income)	38(10.3%)
2	Which the indigenous tree/shrub species most important in your community?	<i>Boswelliapapyrifera</i>	62(16.8%)
		<i>Combretum adenogonium</i>	57(15.4%)
		<i>Croton macrostachyus</i>	45(12.2)
		<i>Anogeissus leiocarpa</i>	44(11.9%)
		<i>Phytolaccadodecandra</i>	40(10.8%)
		<i>Dodonaeaangustifolia</i>	36(9.2%)
		<i>Adansoniadigitata</i>	31(8.4%)
		<i>Oxytenantheraabysynica</i>	24(6.5%)
		<i>Stereospermum kunthianum</i>	18(4.9%)
		Others	13(3.5%)
2.1	Why?	Because of multi-purpose uses such as: medicinal use, food, fodder, furniture, fence	
3	What type of environmental change have you observed in your localities for the past 10 years?	Deforestation	76(20.5%)
		Agricultural expansion	71(19.2%)
		Lost/decrease of biodiversity	64(17.3%)
		habitat Degradation	60(16.2%)
		Expansion of invasive species	57(15.4%)
		Increasing of biodiversity	17(5%)
		No any environmental change	25(6.8%)
4	What are most destructive activities for Hirimi forest?	Tree logging	65(17.6%)
		Grazing	60(16.2%)
		Agricultural expansion	77(20.8%)
		Harvesting of fuel wood	63(17%)
		firing and charcoal production	68(18.4%)
		Seasonal drought	37(10%)
5	Which plant is gradually disappearing from your locality?	<i>Adansoniadigitata</i>	84(22.7%)
		<i>Combretumadenogonium</i>	77(20.8%)
		<i>Boswelliapapyrifera</i>	58(15.7%)
		<i>Oxytenantheraabysynica</i>	50(13.5%)
		<i>Lagenariasiceraria</i>	45(12.1%)

		Others	56(15.1%)
6	What do you suggest the indigenous way for conservation of the forest?	Participatory forest management	73(19.7%)
		Protect the forest from human & animal interruption	70(18.9%)
		Public awareness rising	69(18.4%)
		Replanting/rehabilitation	63(17%)
		Using of alternative biomasses	50(13.5)
		Others	45(12.2)
7	The trend of forest perturbation generally decreasing or increasing?	Increasing	0(0%)
		Decreasing	352(95.1%)
		Remain the same	18(4.9%)

Table 4: most livestock disease revealed in the community

Sn	Inquiry	Response	*Rank(No. call)
1	What are the main human health problems/diseases at your locality? Order list	common cold	1(63)
		diarrhea	2(49)
		malaria	3(37)
		evil sprit	4(33)
		TB	5(27)
		fever	6(21)
		headache	7(20)
		body swelling	8(19)
		stomach pain	9(17)
		injury/wound	10(17)
	Others	67 respondents	

2	What are the main livestock health problems/diseases at your locality?	Disease	Score	Rank
		mange	61(16.5%)	1
		skin parasites	57(15.4%)	2
		leech infection	51(13.8%)	3
		swelling	44(11.9%)	4
		injury/wound	38(10.3%)	5
		rabbis	35(9.5%)	6
		Others	84(22.7%)	

It is important to note that about 60% of the community is used herbal medicine to treat for both human and animal disease. For this reason, people in the community are who have good awareness on those herbal medicinal plants have good perception toward their conservation.