

2016-05-18

Ethnobotanical Study of medicinal Plants used byshinasha people in Benishangulgumuz,western ethiopia

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ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS USED BY SHINASHA

PEOPLE IN BENISHANGULGUMUZ, WESTERN ETHIOPIA

BY

Mengesha Etana Tura

BAHIR DAR, ETHIOPIA

January, 2016

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BOTANY STREM

**ETHNOBOTANICAL STUDYOF MEDICINAL PLANTS USED BY SHINASHA
PEOPLE IN BENISHANGULGUMUZ, WESTERN ETHIOPIA**

By

Mengesha Etana Tura

Advisor: Ali Seid (PhD)

A THESIS SUBMITTED TO THE DEPARTMENT OF BIOLOGY
IN FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF
MASTER OF SCIENCE IN BIOLOGY (BOTANY)

BAHIR DAR, ETHIOPIA

January, 2016.

Bahir Dar University

College of Science

Approval sheet

As a thesis research advisor, I certify that I have read and evaluated the thesis prepared by Mengesha Etana Tura, entitled Ethnobotanical study of Medicinal plants used by shinasha ethnic group in Benishangul Gumuz, Western Ethiopia, I recommended the paper be submitted as fulfilling the requirement for the degree of Master of Science in Biology (Botanical Science).

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Declaration

I under signed, declare that this thesis is my original work; it has not been presented in another Universities, colleges or institutions, for similar degree or other purposes. All sources of the materials used for the thesis and all people and institutions who gave support for thesis work have been duly acknowledged.

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The work has been done under my supervision

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January, 2016

ABSTRACT

An ethnobotanical study of medicinal plants used by shinasha ethnic group in Wombera District, Benishangual Gumuz, Western Ethiopia was carried out from October, 2014 to January, 2016. The area lies between latitudes 0781366 to 103746 North and longitudes 1221780 to 353951 East. The purpose of the study was to document information of medicinal plants and indigenous knowledge on use of medicinal plants by Shinasha ethnic group of Wombera District. A purposive sampling was designed and employed for selection of the study areas (10 sampling sites) and 70 informants (52 males and 18 females) aged between 18-85 years were randomly selected from 10 villages. Ethnobotanical data were collected using semi-structured interview, group discussion and questionnaires. A total of 91 medicinal plants were documented from the study area. Of these 60 were human, 7 veterinary and 24 both human and veterinary medicines. Data were analyzed using: preference ranking, direct matrix ranking, informant consensus factors and percentile. The highest number of medicinal plants was collected from wild habitat (64 %), while 33% was collected from home garden, 3% occurred both in wild habitat and home garden. The most plant parts used in treatment of human disease were leaves (34.6%) followed by roots (20.9%). The most frequently mentioned mode of administration was oral (54%) followed by dermal (27.5%) and the least was found to be application through eyes and ears (3%) each. The most common form of medicine preparation was crushing, pounding and homogenizing in water (30%) followed by boiling and fumigating (16%), and the least were burning and cooking (5%) each. The majority of plants growth form was herbs (33%), followed by trees (28.57%) and shrubs (26.4%). The majority of people used medicinal plant in fresh form (67%), while 19% used dried form, and 14% used both dried and fresh. Deforestation for agriculture, over exploitation, firewood collection, and overgrazing were the main threats of medicinal plants. Moreover, lack of awareness of cultivation in home garden resulted as threats of medicinal plants in the study area. The biggest problem of traditional medicinal remedies is the accurate dosage, which sometimes may even kill patient.

Key words: *Conservation, Ethnobotany, Ethiopia, Indigenous knowledge, Shinasha, Wombera*

Acknowledgements

Above all, I would like to thank my Lord and Savior Jesus Christ for His infinite grant throughout my life. Also I am greatly indebted to my advisor Dr. Ali Seid for his incalculable advises, guidance's, devoted assistance and encouragements throughout my stay in the the university.

The moral support during my study from Ato Fessitsion Woldamlak, Ato Alebachew Tesfye and Fitsum Tewelde Berhan are worth to mention. Also, I would like to thank the following Wombera District offices like police, court, counsel, females and child, communication, land management office for their financial encouragements and material support like GPS. Also my appreciation is to National meteorological agency due to give me climatic data.

Last, but not the least, I'm thankful and my appreciation goes to the traditional healers of Wombera District, staff of Wombera Health center, agricultural and rural Development Office, for this work wouldn't be realized without their participation.

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Acronyms and Abbreviations

CAS- Central Statistical Agency

GPS- Geographical Positional System

ICF- Informant Consensus Factor

IK- Indigenous Knowledge

Ur-use report

WHO- World Health Organization

-Wombera Health Office

WARDO- Wombera Agricultural and Rural Development Office

1 INTRODUCTION

1.1 Background of the study

Ethnobotany is a broad term referring to the study of direct interrelation ship between humans and Plants (Martin, 1995; Balick and Cox, 1996). The indispensable dependency of human beings on plants for their livelihood was primarily started with domestication and dates back 10, 000 Years (Martin, 1995). Traditional medicine is any ancient and cultural based health care practice different from scientific developed medicine and commonly regarded as folk medicine, largely based on orally transmitted knowledge, and used by communities in different cultures (Martin, 1995).

Much of the knowledge on traditional medicinal plants on most cases is available in rural communities and mostly perpetuated by words of mouth, inheriting the medico-spiritual manuscript, within families and small communities (Dawit Abebe and Ahadu Ayehu, 1993). Traditional medicinal practices are common in Ethiopia in which about 80% of the population in the country use plant-based traditional medicine as their major primary health care system (Mirutse Giday, 1999).

Ethnobotany tries to find out how people have traditionally used plants in the past and are still using at present. Ethnobotanic studies allow documentation of important information that serves as base line data for future research and presentation of valuable traditional knowledge for both other communities and future generation (Tesfaye Awas and zemedede Asefaw, 1999).

WHO (2003) defined traditional medicine as “health practices, approaches, knowledge and beliefs incorporating plants, animals and minerals based medicines, spiritual therapies, manual techniques and exercise applied to treat, diagnose and prevent illness or maintain the well being of human beings or his living possessions”. Ethiopia is a country characterized by

a wide range of climatic and ecological conditions possessing enormous diversity of flora and fauna, including large number of potentially useful medicinal plants more extensively available than many other parts of the world (Dawit Abebe, 1986; Balcha Abera, 2003). Ethiopian traditional medicine system is characterized by variations, and is shaped by the ecological diversities of the country, and socio-cultural background and historical development of the different ethnic groups(Tilahun Teklehaymanot and Mirutse Giday, 2007) which are related to migration, introduction of foreign culture, language and religion (Debela Hunde *et al.*, 2004).

Indigenous knowledge is also dynamic as the practitioners make every effort to widen their scope by reciprocal exchange of limited information with each other (Debela Hunde *et al.*, 2006).

The current loss of medicinal plants in the in the country is due to either natural or artificial factors links with the missing of valuable indigenous knowledge associated and documenting traditionally used medicinal plants in the study area which has diversified form of vegetation coverage (Ermias Lulekal *et al.*, 2008). This is due to population growth, the high need of population for agriculture and in order deforestation. Deforestation, agricultural encroachment, over harvesting and/ or indiscriminate harvesting and alarming population growth with increasing demand and consumption are the principal problems which aggravate the rate of extinction of medicinal plants from their habitat and the consequent loss of globally significant plant species (Tsfaye Seifu *et al.*, 2006). Consequently, the local available medicinal plants are extinct in huge amounts in the study area.

Even though, the indigenous knowledge of local people is very important as the base line for extraction of modern drugs, their knowledge and practices are currently under threats. This strong link suggests that there is a need to take an appropriate conservation measure for

threatened medicinal plants and associated knowledge by conducting ethnobotanical research (Ermias Lulekal *et al.*, 2008).

As elsewhere in Ethiopia, the community of Wombera District uses traditional medication mainly involves the local available medicinal plants, which is the major important health care system. Moreover, the literature elsewhere in Ethiopia has no more information about the threats and conservation of medicinal plants in the study area. Even if there are relatively high naturally existing trees and afforestation programs by the communities, the local people have mostly reforestation the exotic trees, which are mostly not as much as important for this ecosystem as endemic trees. Thus, the present study is initiating with aim to add new ethnobotanical information concerning to indigenous knowledge on reforestation of endemic trees rather than exotic trees, threats and conservation of medicinal plants as well as linking the dosage of traditional medication of local people of wombera District with the modern drugs. Even though the local people have high capability to cure varieties of ailments, there are the problems of precise dosage among different people. Therefore, this is one of my concerns.

1.2 Objectives

1.2.1. General objectives

The general objectives of the study was to document plants of medicinal value to Human and livestock in Womberta District and describe the indigenous knowledge of people on the preparation, uses, conservation and threat of medicinal plants.

1.2.2. The specific objectives of the study

- Identify plant species used for medicinal purposes for treating human and livestock diseases by the Shinasha ethnic group in Wombera District;
- Document plant parts used for medicinal values and method of medicine preparation;
- Document indigenous knowledge of the local people on medicinal plant usage;
- Identify the habitats of medicinal plants and describe conservation measures being taken by the communities of Wombera District.

1.3. The research questions:

- What are the medicinal plants used by the Shinasha ethnic group?
- How the shinasha ethnic group does obtain and uses plants for the treatment of human and animal aliments?
- How does the traditional medicinal plants knowledge distributed among age groups of the ethnic group?
- What are the major threats of medicinal plants?

2. LITERATURE REVIEW

2.1 Origin and Developments of ethnobotany

The term “Ethnobotany” was first suggested by John Harshberger in 1895 that it was defined as “the use of plants by primitive and aboriginal peoples” (Balick and Cox, 1996). Ethnobotany is the study of people’s classification, management and use of plants (Martin, 1995). Pande (2000) also defined Ethnobotany as it deals with the direct relationships of plants with human kind.

Ethnobotany encompasses all studies that concern the mutual relationships between plants and traditional people. During the century which has intervened, considerable attention has focused not only on how plants are used, but also how they are perceived and managed, and on the reciprocal relationships between human societies and the plants on which they depended (Cotton, 1996). As a result, Ethnobotany has being repeatedly rdefined and no definitive agreement in its interpretation has been reache (Yen, 1993; cited in Cotton, 1996).

The term “Ethnobotany” was published in 1896 in the scientific literature and started being considered as a field, which elucidates the cultural position of tribes who used the plants for foods, shelters or clothing. In 1916, Robins and his co-workers began to introduce some new collection, pesticides, clothing, shelter and other purposes (Fisseha Mesfin, 2007). The science is important to define local community’s plant resource needs, utilization and management strategy. As the consequence, the conservation of plants, including medicinal ones, and the associated knowledge as part of living cultural knowledge and practices between communities and the environment is essential for perpetuation of biodiversity (Martin, 1995).

2.2 The role of traditional medicinal plants in Human health care services

Traditional medicine has been used for thousands of years with great contributions made by practitioners to human health, particularly as primary health care provides at the community level and has maintained its popularity worldwide (WHO, 2008). WHO redefined traditional medicine as it is the sum total of knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures that was been used to maintain health, as well as to prevent, diagnose, improve or treat physical and mental illness (WHO, 2008).

In a study made by (Kebu Ballemie *et al.*, 2004) the order of importance of the threat factors on medicinal plants in Fentalle area were harvest of medicinal plants for firewood, charcoal, drought, agriculture, house use and trade. The available modern health care services of the country are not only insufficient but also inaccessible and unaffordable to the majority (Halie Yineger *et al.*, 2008). This problem along with the rapidly increasing human population and cultural resistances towards the use of modern medicines means that the majority of the people in Ethiopia are dependent on traditional medicines of mainly plant origins to manage various human ailments (Dawit Abebe, 2001).

Hamilton (2004) categorized traditional medicinal system into three.

(1) Traditional medicinal systems, with written traditions of documentation of knowledge, pharmacopeias for doctors and institutions for training doctors; (2) Traditional medicinal knowledge (folk medicine), which is orally transmitted and associated with households, communities or ethnic groups; and (3) Shamanistic medicine, with a strong spiritual element and which can only be applied by specialist practitioners (Shamans).

In the early 16th century, a European traveler called Francisco reported the use of herbs as purgatives in Ethiopia.

Another British traveler, James Bruce, who stayed in Ethiopia from 1769 to 1771, also reported the wide use of a plant locally known as 'wagnos' that was later named *Brucea antidysenterica* (Simaroubaceae), as a remedy against dysentery. Medical text books written in Geez or in Arabic in Ethiopia between the mid 17th and beginning of 18th century imply that plant have been used as a source of traditional medicine in Ethiopia from time immemorial to combat different ailments and human sufferings (Belachew Wassihun, 2008).

The practice of traditional medicine is widespread in China, India, Japan, Pakistan, Sri Lanka and Thailand. In china, about 40 % of the total medicinal consumption was beig attributed to traditional tribal medicines (Lucy and DaSilva, 1999). In Ethiopia, traditional medicinal practices and remedies are recorded in oral tradition and in early medico-religious manuscripts and traditional pharmacopoeias, which, according to the estimates of some historians, date back to the 15th century AD (WHO, 2001).

According to Jansen (1981), in Ethiopia, even though the traditional medicinal parctices are the best source of information about the knowledge of medicinal plants, it was found very difficult to obtain their traditional medicinal information as they considered their indigenous knowledge as a professional secrete, only to be passed orally to their elder son at old age. Haile Yineger and Dilnesaw Yehwalawu (2007) in their study on Sokoru District added that traditional medicines are useful for poor people who have little access and could not afford the cost of modern medicine. Dawit Abebe (2001) emphasized that there is a large magnitude of use and interest in medicinal plants in Ethiopia due to acceptability, accessibility and biomedical benefit.

Cotton, 1996 defined traditional medicine as it refers to any ancient, culturally based health care practice different from scientific medicine and it is commonly regarded as indigenous, unorthodox, alternative or folk and largely orally transmitted practice used by communities

with different cultures.

2.3 Some ethnobotanical studies of medicinal plants conducted in Ethiopia

Among some of researchers that were conducted Ethinobotanical studies of medicinal plants in Ethiopia were: Tilahun Tekelhaymanot and Mirutse Giday (2007), on ethnobotanical survey of medicinal plants used by people in Zeige pensula; Mesfin Tadesse *et al.*, (2005) , on survey of medicinal plants used to treat human diseases in Seka Cheorsa, Jimma, zone; Haile Yineger *et al.*, (2007), on traditional plants knowledge and use by local healers in sokoru District, Jimma, Zone; Fisseha Missfin (2007), on an ethnobotanical study of medicinal plants in Wagano Woreda; Etana Tolessa (2007), on use and conservation of traditional medicinal plants by indigenous people in Gimbi Woreda; Endalew Amenu (2007), on use and conservation of medicinal plants by indigenous of Ejaji arera (chelya Woreda) and also other researchers.

According to Tsige Gebremariam and Kaleab Asres (2001), research programs in traditional medicine must be realistic and be based on the primary health care needs of the country with an objective of developing safe, effective and quality phytotherapeutic preparation, which can supplement and or replace modern chemotherapy.

The study conducted by (Debela Hunde *et al.*, 2004) in Boosat around Welenchiti area, stated that shrubs rank first with 59% followed by herbs 14% by which indigenous people of Boosat derive theirs and their livestock remedies. Where as the study conducted by Mirutse Giday (2001), on Zay people indicated as herbs stood first in which Zay people derive their medicine (55%), followed by trees and shrubs (33%). Moreover, the study explained that 68.6% of herbal remade were applied orally and 31.4% were applied externally. Further, swelling, rheumatism, snakebite, tooth pain and eye pain were among the human ailments treated with medicinal plants. However, the finding of (Debela Hunde *et al.*, 2004) indicated

that leaves are the most widely used plant part (33%) followed by roots (28%). People use medicinal plant parts, to treat human or livestock ailments while they are fresh, dried or both.

2.4 Medicinal plants as the base for development of modern drugs

Searching new drug from traditionally used medicinal plant can be the shortest path to success (Berhanemeskel Weldegerima, 2009) and indigenous people remain the ultimate resource for retrieving this information for the purpose of application, particularly in modern medicine (MacDonald, 2009) .

Ethnopharmacology is a highly diversified approach to drug discovery involving the observation, description, and experimental investigation of indigenous drugs and their biological activities. In addition, Taxonomy and the newer discipline Ethnobotany have now become an integral part of drug discovery from plants (Jachak and Sakalani, 2007) and Sakalani, 2007). Among the most popular extracts used in Europe are garlic (*Allium sativum*, antimicrobial and blood cholesterol lowering), Ginkgo (*Ginkgo biloba*, circulatory insufficiency) and others. However, the knowledge and use of plant is an integral part of many ethnic rural cultures, the extent of which has not yet been studied in depth (Abbink, 1995). Perhaps the best-known species is *Phytolaca dodecandra*, extracts of the plant, commonly known as endod, is using as an effective molluscicide to control, shistomiasis (Aklilu Lemma *et al.*, 1984).

2.5 Role of Plants in Veterinarian medicine

Ethnoveterinarian medicine which refers to traditional medicinal animal health care knowledge and practices comprising of traditional surgical and manipulative techniques, traditional immunization, magic co-religious practices and belief, management, practices and the use of herbal remedies to prevent and treat a range of diseases problems encountered by live stock (Tafesse Messfin and Mekonnen Lemma, 2001).

Ethnoveterinary medicine provides traditional medicine, which is locally available and usually cheaper than standard treatment. In rural and some urban areas where relatively few veterinarians and shortage of facilities are used. Consequently traditional medicinal plants are the only choice to treat many ailments (MaCorkle, 1995).

Likewise, in some of Wombera District villages for instance Abamergo and Aberhena have no veterinarians and shortages of facilities. Therefore, local communities were forced to use traditional medicinal plant to cure their livestock diseases. Ethiopia is leading countries of Africa in live stock population (Mirutse Giday and Gobena Ameni, 2003). The everdeclining provision of animal health services has resulted in the appearance of a number of epizootic diseases reducing the economic efficacy of livestock production in Africa (Mirutse Giday and Gobena Ameni, 2003).

Most modern drugs are expensive and as a result not affordable by majority of Ethiopian and farmers/pastoralists most of them rely on their traditional knowledge practices and local available medicinal plants in the control of diseases of their domestic animals. The study conducted by (Wirtu *et al.*, 1997) on central Ethiopia stated that healers and farmers use similar method of diagnosis of livestock diseases; they assess body temperature by introducing their finger into the rectum or oral cavity. They conducted physical examination for example erection of hairs. Likewise the local people examine their cattle when they lose appetite and by observing the changes on their dung's as well as seeing if or not ruminate early in the morning and give medicine if changes were happened from the previous.

2.6 Marketability of medicinal plants

Africa has made considerable progress in the export of medicinal plants. For example, Cameroon is the source for the world market of *Prunus africana* bark (Medhin Zewdu, *et al.*, 2001) and Nigeria is the source for the world market of *Zingiber officinale* (ginger) (Okigbo

and Mmeka, 2006).

Medicinal plants are also on sell in domestic markets; for instance, it accounts for an average of 5000 plant species (40%) of the medicine market in China (Medhin Zewdu, et al., 2001) and in South Africa, between 400 to 550 plant species is currently sold for use in traditional medicine (Boadker, 2005). India uses about 7000 plant species (Verma and Singh, 2008) and market of phytomedicine, was estimated to be 250 million US dollar.

Ethiopia is not legally known in exporting and importing medicinal plants and the only medicinal plants export from Ethiopia is *Catha edulis* (Desalegn Dessisa, 2001). The study made by Desalegn Dessisa (2001) indicated as medicinal plants trade in Ethiopia involves traditional medicinal practitioners, street vendor and collectors and Little was known about the patterns of local medicinal trade.

2.7 Threats to medicinal plants

Some studies have shown that most of the medicinal plants used in Ethiopia were harvested from the wild (Mirutse Giday, 1999; Tesfaye Awas and Zemedede Asfaw, 1999). Decline in the knowledge and utilization of medicinal plants of Zay people is due to environmental degradation and intense deforestation (Mirutse Giday, 2001). In a study made by (Kebu Ballemie *et al.*, 2004) the order of importance of the threat factors on medicinal plants in Fentalle area were harvest of medicinal plants for firewood, charcoal, drought, agriculture, house use, over use and destructive harvesting.

Likewise, in Wombera District, lack of awareness to cultivate medicinal plants in the home garden (collected medicinal plants from wild habitats) by the local people made the threats of medicinal plants. In addition, the young generations ignore the indigenous knowledge of the old local people and they are disinterested to learn from old people due to modernization,

which facilitate the extinction of medicinal plants. Furthermore, some informant reported that lack of right to get license of traditional medicinal plants practice made threatened the medicinal plants in the localities.

Even if there are relatively high naturally existing trees and a forestation program by communities, the local people have mostly reforestation the exotic trees, which are mostly not as much as important for this ecosystem as endemic trees.

2.8 Conservation of medicinal plants

There is some conservation actions measures that have been undertake around the world designed to protect threatened medicinal plants from further damage (Cunningum, 1996). This includes ex-situ methods, traditional medicinal plants that can be conserve in gene banks, botanic gardens and field gene banks (Zemedede Asfaw, 2001). Some traditional medicinal plants may have to be conserved in-situ in their natural habitats due to the difficulty for domestication and management or failure to produce the desired amount under cultivation (Franz, 1993; cited in Zemedede Asfaw, 2001). In addition, tissue culture technique is also important in ex-situ conservation of traditional medicinal plants (Abebe Demissie, 2001).

The finding of Zemedede Asfaw *et al.*, (2006), also pointed out that, the dynamic indigenous knowledge practice for the optimization of the uses and management of plant resources particularly in Ethiopian dry land is among the key recommendations for the conservation, use and management of biodiversity. In the Study area by organizing local people on tree plantation programmes especially cultivation of endemic trees in their farmland and home garden can conserve in general plants and particularly medicinal plants.

3 .MATERIALS AND METHODS

3.1 Description of the study area

3.2 Location

Wombera District is located in western Ethiopia, Benishangul Gumuz National Regional state. It is one of the seven Districts in Metekel Zone with 33 villages. Its relative location is between 1221780 to 353951 East and 0781366 to 103746 North and altitudinal ranges from 576 meter to 2534 meter above sea level at about 656 kilo meters West of Addis Abeba. Wobmera District is bordering with six Districts of the Regional state. The borders are Bullen District in the East, Dangure in the North East, following the Abay River: Yaso District in the South East, Agalo-Meti in the South, Sirba Abay in the South West and Guba District near the biggest Ethiopian Renaissance Dam (Figure1).The topography of the District consists of mountains, plain, valley and undulating.

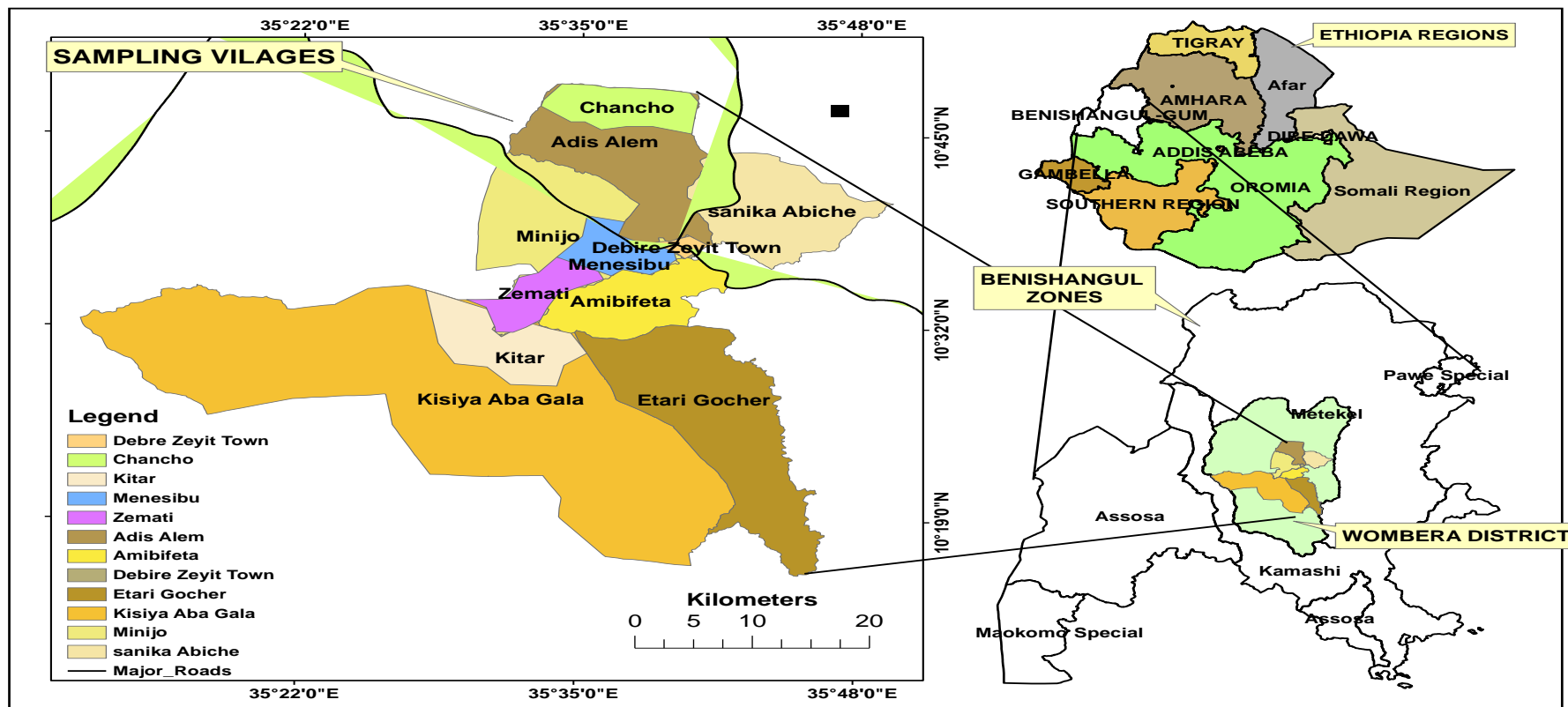


Figure 1: Map of Wombera District showing the study Villages

3.3 Climate

Agroecologically, Wombera District is classified as high temperature area (75%), medium temperature area (15%) and low temperature area (10%). Based on 5 years Climatic data obtained from National Meteorological Service Agency, the average annual rainfall is 186.6mm and the average annual temperature is 21.5 (Fig2).

The annual mean minimum and maximum temperature are 10.025 and 23.8 respectively. The highest mean minimum and maximum temperatures were recorded in September and March respectively for the last 5 years (Figure 2). The total mean annual rainfall is ranges from 900-1400 mm and the highest rainfall was recorded in July.

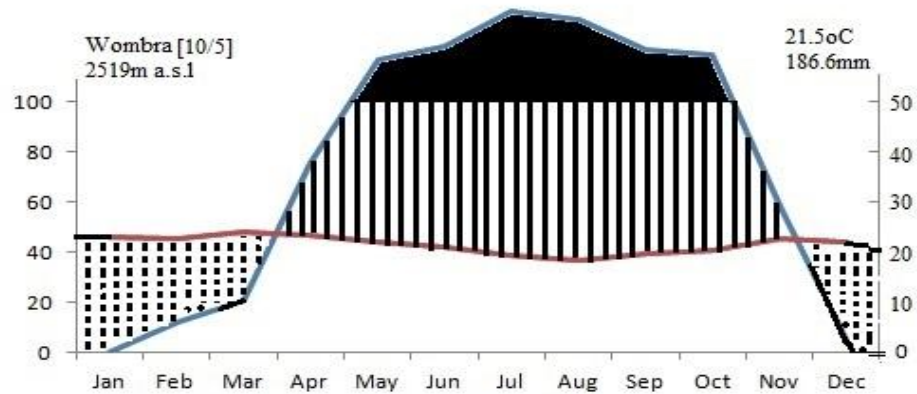


Figure 2: Climadiagram following the method of Walter (1985).

Data Source obtained from National Meteorological Service Agency, Bahir Dar Branch.

Note: The only 5 years climatic data were available at the Wombera station.

3.4 Land use and vegetation features

People in Wombera District use and classify their land culturally based on use. For instance Truff land, Agricultural land, Browsing land and forestland. According to the information obtained from Wombera District agricultural and rural development office (2013) the total area of the District is about 746425 hectares. The vegetation coverage of the study area is about 327072.5 hectares, of this 12192 is large trees, 195152.5 hectares are shrubs and bushes while the agricultural available land is 224978 hectares, of this cultivated land is about 49510 hectares while unavailable land (mountains and valley) is about 29457 hectares and the truff land is 16781.5 hectares (WARDO, 2013).

Relatively the main coverage of the study area is vegetation and agricultural land but the least coverage of the study area is the truff land, which is 16781.5 hectares. So Wombera District administrative with cooperative of agricultural workers should be allocating ample truff for the right of cattle, unless the life of cattle for the future is at risk.

The common vegetation of the study area were mostly large trees, shrubs and bushes that includes *Cordia africana*, *Acacia seyal*, *Acacia gerrardii*, *Croton macrostachyus*, *Vernonia amygdalina*, *Brucea antidysentrica*, *Hygenia abyssinica*, *Myrsine africana*, *Ficus species*, *Eucalyptus globulus*, *Carssa edulis*, *Rhamnus prinoides*, *Syzygium guineese*, *Albiza gumifera*, *Phytolacca dodecandra*, *Rumex nervosus*, *Maesa lanceolata*, *Gardenia ternifolia*, *Ximenia americana*, *Rosa abyssinica*, *Millettia ferruginea*, *Arundinaria alpine* are plant species ranging from low land to high land agro ecological zone of Wombera District(WARDO, 2013).

3.5 Population

People belonged to the Shinasha ethnic group make the majority of those living in Wombera District. Moreover, Gumuz, Oromo, and Amahara ethnic group live in the District. Based on the population and housing census (CSA, 2007) the total population size of Wombera District is about 74251 of which 36104 males and 38147 are females.

The District has one urban center (Debrezit Twon) in which the total population of 1499 males and 1811 females and the rest 67863 of the total population are live in 32 rural villages.

The majority people of the District lead their life on cultivation of crops and rearing of livestock while a few relies on exchanging of goods and Gold.

3.6 Health status

In the District, there are three health station and 24 health care centers but a few villages have no nearby health care center. For instance, Ashabent, Abamergo and Aberhena villages are some of them. The reports from Wombera health office (WHO, 2013) showed that 460251 people were being assiste by this service, which covers only 63% of the populations. Thus, the services do not afford (cover) the need of 37% of the total population in Wombera District. This and their indigenous knowledge's (IK) forced the local people to use traditional medicinal plants.

The major human health problem of the District as reported by (WHO, 2013) were malaria, water born diseases, Diarrhea, Gastritis intestinal parasites, Typhoid, skin disease, Tuberculosis, Rheumatism, Tonsillitis, Headache. Therefore people of the study area use traditional medicinal plants to overcome these diseases where the health services are at most shortage and do not afford their need in addition to modern medication.

Concerning to livestock the District consists of population of cattle, mule, horse, donkey, goat, sheep and poultry (WRADO, 2013). The main problem of the livestock in the study area is absence of adequate health services and facilities. This is due to shortage of well-trained veterinarian doctors to solve the main out break diseases in the study area. Only one veterinary doctor is found in the center of District (Debrezit) and lower professionals are found in some of the villages. Thus, the local communities were mostly force to use traditional medicinal plants to cure livestock diseases. The most common livestock diseases in the study area are blackleg, bolting Anthrax, cough, Trypanosomaiasis, Foot mouth and drematophilisis are affects most livestock (WARDO, 2013).

3.7 Methods

3.7.1 Selection of the study sites

A reconnaissance survey of the study area was conducted from October 1 to 30, 2014. Ten villages were selected purposively based on the availabilities of traditional healers' knowledgeable elders, vegetation coverage and settlement of ethnic group identified with the assistance of local authorities of District. The villages were listed on Figure1.

3.7.2 Selection of the informants

Selection of the informant was performed following Martin (1995) who indicated that when recording indigenous knowledge held by knowledgeable traditional healers and by considering the budget and time needed for the completion of this work. 70 informants (52 males and 18 females) were randomly selected by tossing coin, whenever head of the coin was up if she or he volunteered to participate.

The ages of the informants were between 18 to 85 and about 20 key informants (6 females and 14 males) were purposively selected that includes elders, healers and knowledgeable persons with the help of local administrators and the age of key informants were between 30 to 75.

3.7.3 Collection of data

Ethnobotanical techniques were employed to gather data on medicinal plants used by Shinasha ethnic group in Wombera District. These were collected using field observation, group discussion and semistructured interviews between January 1 to 30, 2014 based on procedures recommended by Martin (1995) and Cotton (1996). For instance, data collection was made based on questionnaire prepared in Shinashgna language and later translated to English language with the help of translators (Appendix 1a and 1b).

The volunteers of the informants were first confirmed before starting data collection from the selected respondents of all the villages. This was done through awareness creation for informants by telling them the future significance of the research. For instance, the bases of the extraction of most modern drugs are generally the plants and particularly medicinal plants.

The group discussion and interview with informants were done through direct face-to-face contact between the researcher and informants to collect ethnobotanical data. Informants were visited twice to confirm the consistency of the data Collected from local people. The data collected includes common human ailments, informant name, parts of medicinal plants used for treating different ailments, route of administration, methods of preparation and application as well as dosage

3.7.4 Medicinal plants Collection and identification

Medicinal plants used by Shinansha ethnic group of the Wombera District was mostly collected from the wild habitats and some from cultivated sources. The local names, habits and use of plants were recorded for each of the species.

Identification of voucher specimens was done on the field while collecting the plant species. For identification of the plants that were not readily identified in the field were taken to Bahir Dar University (BDU) Biology department Herbarium. Then these specimen were identified using taxonomic key in the various volume of Flora of Ethiopia and Eritrea (Hedberg and Edward, 1989) Edward *et al.*,1995) with collaboration of taxonomic expert of botany in Department of biology (Dr. Ali Seid). However not all medicinal plant documented were collected and pressed due to seasonal problem.

3.8 Methods of Data analysis

Descriptive statistical method such as percentage and frequency were employed to analysis and summarize the data on medicinal plants, associated knowledge as well as use and conservation. Tables and figures showing the result produced. The degree importance of medicinal plants was checked by conducting various exercises for instance direct matrix ranking, preference ranking and informant consensus factor.

The most useful information gathered on medicinal plants reported by people are medicinal value, methods of preparation, route of application, disease treated , dosage, habit used were analyzed through descriptive analysis. To get relative frequency distribution, number of any species times 100 divided by total frequency of all species. $\text{Relative frequency} = \frac{N_{ij}}{N}$ of any

species x 100/ Total species.

Average ICF=Total ICF/Total Ur.

3.8.1 Informant consensus factor (ICF)

In order to evaluate the reliabilities of information recorded, informants were contacted at least 2 times for the same idea directly or indirectly and the validity of the information was proved and registered, unless rejected. The similarity between information provided by various informants was calculated using informant consensus factor from eight use-categories (Table 9). An ICF value close to 1 was taken as an indication of high intra-cultural consensus. That means more healers use the same plant species but a value close to zero was regarded as a low probability of multi-use as given by Leonti *et al.*, (2001).

The informant consensus factor was calculated for each category to identify the agreements of the informants on the reported cure for the group of ailments. The ICF was calculated as follows: number of use citations in each category (nur) minus the number of species used (nt), divided by the numbers of use citations in each category minus one (Heinerich *et al.*, 1998). $ICF = \frac{nur - nt}{nur - 1}$.

3.8.2 Preference ranking

Preference ranking was conducted by following Martin (1995). It was performed using 9 selected key informants of the most important medicinal plants first on the basis of healing power of wounds and secondly on the basis of healing several ailments. Accordingly, nine medicinal plants were selected and ranked by the 9 key informants based on healing wounds by giving the highest value (5), high (4), medium (3), low (2) the least (1) and zero is none (Table 10). These

values were summed up and ranked for each plant species.

3.8.3 Direct matrix ranking

Also by following Martin (1995), direct matrix ranking were being do in order to compare multi-purpose use categories of the plants. Based on the information obtained from informants, eight medicinal plants having multi-purpose use of a given species were selected. Therefore, eight multi-purpose plant species were selected and eight use categories (values) for instance medicine, food, fodder, firewood, charcoal, fencing, furniture and construction making 8 selected key informants to assign use values to each species of medicinal plants.

Each key informant was asked to assign use value 5-the best, 4-very good, 3-good, 2-less, 1-the least used and 0 is not used. Lastly the average use-value for each category was calculated and the mean value for each category was summed up for each plant species and ranked them (Table 11).

4. RESULTS AND DISCUSSIONS

4.1 Indigenous Health Knowledge

Local community of wombera District has several indigenous knowledge for treating human and livestock ailments. Some of the informants participated in this study were herbalist, delivery practitioners and bone setting. They have an immense knowledge on preparation of plant remedies for health problem that could occur in their area.

In the study area, traditional medicinal practitioners obtained from plants can cure most of the health problems. For instance disease like rabies, hepatitis, Dengue, skin disease, intestinal parasites are some of them. Nevertheless, other informants responded during partial discussion that some disease was not curable by traditional treatment need modern medication from hospitals. For instance Tuberculosis and diabetes are some of the diseases that people preferred modern medication.

4.2 Indigenous Botanical and Ecological knowledge

The local people have their own knowledge of ecological classification based on climatic condition as high temperature, medium temperature, and low temperature, which are Werewa, Geshira, and Geya respectively in Shinashigna language.

The local people have botanical knowledge by grouping vegetations based on their appearance, height, leaf size. For instance, Baze-Taga (shinashigna) is a name given for plants having densely forest and large trees. Bodaa-dessa- is grassland vegetation. The local peoples of Wombera District grouping soil based on moisture content, color, heavy and easy. Depending on color they classify soil as: Akishawa, shiya, Bgre-desa and Okaa (shinashigna) which means black,

sandy, red and humus soil respectively.

The varieties color of soil is due to the presence of different organic content and mineral ions in it.

Akishawa- meaning black soil due to its color and with better fertility than other types of soil. For instance, crop like *Zea mays*, *Vicica faba*, *Allium cepa*, *Eragrostis tef* and *Guzitoia abyssinica* are better cultivated on such soil types.

Shiya- meaning sandy soil and silt soil resulting from deposition by erosion. These types of Soil are easily identified by it content of fine sand soil with silt and high drainage (the least water holding capacities).

Bgire desa- meaning clay soil and it is red in color and poor fertility.

Okaa- meaning soil types containing high amounts of organic materials from animal and dead leaf and wastes drown out of house. For instance, *Allium Sativum*, *Coccinica ancotte*, *Abyssinica cabbage*, *Coffee arabica* can be Cultivate on these soil types.

4.3 Diversity of medicinal plants

Habit analysis of plant used by the people of Wombera District for treatment of both livestock and human ailments reveals that herbs take over the largest proportion of growth form (Figure 3 and Appendix 3). Out of total 91 medicinal plants documented in he study area, about 30 species (33%) of plants were found to be herbs, which is similar to the research done by Endalew Amenu (2007) and Mohammed Adefa and Berhanu Aberha (2010) while disagree with Miruse Giday and Gobana Ameni (2003); Erimias Lulekale (2005) and EtanaTolossa (2007) which reported that shrubs take the first rank in the study of medicinal plants. Tree is the second dominant medicinal plants in the study area, which is 26 (28.57%), followed shrub, climber, epiphytes and lianas respectively.

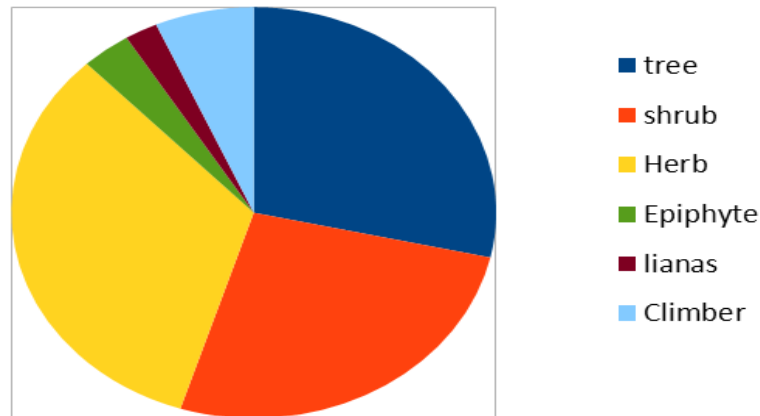


Figure 3: Growth form of medicinal plants used to treat human and livestock ailments.

4.4 Major Plants use categories by the local People

Among the 91 medicinal plants documented in the study area, all species of plants were used for medicinal purpose. Moreover, the local Communities utilized medicinal plants for other multi-purpose (use-categories). Therefore based on the information collected from the informants, 8 use categories (Table 1) were set in which a total of 1574 use reports (Ur) were recorded from 302 frequency of occurrence among 91 species of medicinal plants.

As quantitative informants consensus factor (ICF) analysis of eight use-categories of plant species indicated that food plants take the highest. ICF value (0.879) followed by medicinal use-categories with ICF value is 0.85, which is similar with the finding of Mohammed Adefa and Brehanu Aberha, (2010).

As we can observe (Table 1) the most of the informant consensus factor value are closed to one (1) that shows similarity in the use of plant for multi-purposes and almost all use categories are used equally except the construction purpose, which is less ICF (0.5). This indicated that relatively the local people used plants less for construction compared with other use categories as

evidence collected from Informants.

Table 1 Informant consensus factor (ICF) of eight use-categories of plants in wombera District

Use-categories	Number of species	% of species	Use report (Ur)	% of use report	ICF=Nur-Nt/Ur-1
Medicinal	91	100	619	39.4	0.85
Food	30	33	258	16.4	0.88
Charcoal	26	28.6	97	6.1	0.74
Furniture	10	11	32	2	0.71
Fire wood	35	38	178	11.3	0.81
Fence	37	41	165	10.5	0.78
Forage	48	53	175	11	0.73
Construction	25	27	50	3.2	0.51
Total	302		1574	100%	6.01

Average ICF=6.01/8=0.75. This indicates that nearly the ICF value is approaches to one, which means the local communities use mostly plants for multi-purpose in addition to medicinal use as Leonti *et al.*, (2001).

4.5 Medicinal Plants used to treat Human ailments

Medicinal plants are the primary remedies for treatment of several ailments in the study area. Out of a total 91 medicinal plant collected from the study area 83 plants species (91.2%) have great medicinal importance for treatment of human diseases. However, only 72 plants species (79%) were employed exclusively for treatment of human ailments (Table 2). The taxa distribution of species shows that the plant comprises 63 genera and 44 families.

Accordingly, *Fabaceae (Leguminosae)* make up the highest proportion, 6 species each (8.3%),

followed by *Poaceae* with 5 species (6.9%), *Rutaceae* 4 species (5.5%), *Euphorbiaceae*, *cucurbitaceae*, *Asteraceae* and *Laranthaceae*, 3 species (4%) for each. However, *Boraginaceae*, *Moraceae*, *Cruciferae*, *Simaroubaceae*, *Cupressaceae*, *Caricaceae*, *Ranunculaceae*, *Araliaceae*, *Rubiaceae*, *celastraceae*, *plantaginanae*, *Malbenaceae*, *Mellaceae* and *linaceae* each have one species (3%) (Appendix3 and 4; Table 2). Therefore, these are the least medicinal plants collected from the study area. With the current study Dawit Abebe et al., (2003), reported similar finding and Balcha Abera., (2003) as *Fabaceae* is the highest proportion to treat human aliment

Table 2: Number of plant species in each family used to treat health problem in Wombera District

NO	Family name	Number of species			
		Human	Livestock	Both	Total
1	<i>Asteraceae</i>	4	4	2	10
2	<i>Fabaceae</i>	6	-	-	6
3	<i>Poaceae</i>	5	-	-	5
4	<i>Cucurbitaceae</i>	3	-	2	5
5	<i>Euphorbiaceae</i>	3	-	1	4
6	<i>Rutaceae</i>	4	-	-	4
7	<i>Myrsinaceae</i>	-	1	2	3
8	<i>Rosaceae</i>	2	-	1	3
9	<i>Solonaceae</i>	2	1	-	3
10	<i>Loranthaceae</i>	3	-	-	3
11	<i>Tiliaceae</i>	2	-	-	2
12	<i>Compositae</i>	2	1	-	3
13	<i>Myrtaceae</i>	2	-	-	2
14	<i>Musacea</i>	2	-	-	2
15	<i>Polygonaceae</i>	2	-	-	2
16	<i>Rubiaceae</i>	1	1	-	2
17	<i>Olaceae</i>	1	-	1	2
18	<i>Aliaceae</i>	2	-	-	2
19	<i>Boraginaceae</i>	1	-	-	1
20	<i>Meliantaceae</i>	-	-	1	1
21	<i>Utricaceae</i>	-	-	1	1

22	<i>Apocyanaceae</i>	-	-	1	1
23	<i>Acanthaceae</i>	-	-	1	1
24	<i>Aloaceae</i>	-	-	1	1
25	<i>Moraceae</i>	1	-	-	1
26	<i>Simaroubaceae</i>	1	-	-	1
27	<i>Cupressaceae</i>	1	-	-	1
28	<i>Rhamnaceae</i>	-	-	1	1
29	<i>Caricaceae</i>	1	-	-	1
30	<i>Bignoniaceae</i>	-	-	1	1
31	<i>Ranunculaceae</i>	1	-	-	1
32	<i>Phytolaccaceae</i>	1	-	-	1
33	<i>Araliaceae</i>	1	-	-	1
34	<i>Canellaceae</i>	-	-	1	1
35	<i>Celastraceae</i>	1	-	-	1
36	<i>Plantaginaceae</i>	1	-	-	1
37	<i>Malvaceae</i>	1	-	-	1
38	<i>Loganiaceae</i>	-	-	1	1
39	<i>Menispecae</i>	1	-	-	1
40	<i>Verbenaceae</i>	1	-	-	1
41	<i>Zingiberaceae</i>	-	-	1	1
42	<i>Meliaceae</i>	1	-	-	1
43	<i>Linaceae</i>	1	-	-	1
44	<i>Myrsinaceae</i>	3	3	1	7

4.6 Plant Parts used for medicine

The data analysis for plant parts used (Table 3) showed that the indigenous people in the Study area mostly use leaves 63(34.6%) for preparation of remedies and the roots take the 2nd rank, 38(20.9%) seeds, 25(13.7%), Bark, 23(12.64%), stem 17(9.34%), Sap 9(4.9%) and fruits, 7(3.8%) are 3rd, 4th, 5th, 6th, and 7th respectively. Likewise Mohammed Adefa (2010) reported that leaves are predominated used and followed by roots in the treatment of different ailments.

In contrary, Ermias Lulekal *et al.*, (2008) have found roots have taken the highest proportion in the Preparation of medicinal plants to treat diseases in Mana Angetu District. In this regards, Dawit Abebe and Ahadu Ayehu (1993), have indicated that plant harvest involving roots, rhizomes, bulb, bark and stem have a serious effects on the survival of the mother plant in it habitat.

Table 3 : Part of plants used for medicine of human and livestock in

Wombera District.

No	Plant parts	No of plant used	Rank	percentage
1	Leaf	63	1 st	34.60
2	Root	38	2 nd	20.90
3	Seed	25	3 rd	13.7
4	Bark	23	4 th	12.64
5	Stem	17	5 th	9.34
6	Sap	9	6 th	4.9
7	Fruit	7	7 th	3.8
	Total	182		100

4.7 Routes of application

Analysis of data for routes of application of plant remedies (Table 4) showed that in the study area application is administrator through several ways. Actually, it depends on the kinds of disease to be treated.

The data reveals that oral, 96(54%) is the highest route of application of remedies and Dermal is the most second route of application of remedies 49 (27.5%). Besides Nasal, 17(9.5%), Dental, 10 (5%), and ocular and ear canal, 3, (2%) for each are 3rd, 4th and 5th respectively. Similarly Kebu Balemie *et al.*, (2004), Debela Hundie *et al.*, (2004) and Ermias Lulekal *et al.*, (2008) have reported oral to be the major route followed by dermal application. According to the information obtained from informants oral application of treatment have healing power of certain disease than other application due to reaction of remedies with pathogens.

Table 4: Route of applications of medicinal plants in Wombera District

no_	Route of application	Number used	Percentage
1	Oral	96	54%
2	Dermal	49	27.5%
3	Nasal	17	9.5%
4	Dental	10	5%
5	Ocular	3	2%
6	Ear canal (Oricular)	3	2%
7	Total	178	

4.8 Methods of preparation of medicinal Plants

Local communities prepared medicinal plants by crushing, pounding, homogenized in water 45(30%) and this is the major ways of preparation of medicinal plants to treats certain aliment. Boiling and inhaling the steam or fumigate preparation is 25(16%) and the second most dominant. Boiling, warming before fire, chewing, latex and sap collection, powdered,burned, cooked, baked are 15(10%), 14(9.33%), 10(7%), 13(9%), 10(7%), 7(4.65%) are ways of preparation respectively. Therefore, the least preparation of medicinal plants in the study area is burned and baking or cooking, which is 7(5%), (Table 5).

Other researchers Kebu Balemie *et al.*, 2003 and Endalew Amenu (2007) has also found the same finding and crushing preparation is the first rank in Ejaji area and in Fentile Area, Eastern shewa, respectively. But Ermias Lulekal *et al.*, (2008) has reported concoction be largely used in mana Angetu district which is different from this findings.

Table 5 Forms of medicine preparation by local people of the study area

No	Form of preparation	Preparation number	percentage
1.	Warming before fire	14	9.33
2.	Boiling (decoction)	15	10
3	Boiling and inhaling or fumigated	25	16
4	Powdered	10	7
5	Crushed, pounding and homogenized in water	45	30
6	Chewing	14	9.3
7.	Burned	7	5
8	Latex and sap collection	13	9
9	Cooked and baked	7	5

4.9 Dosage of medicinal plants in treatment of Human Diseases

The quantification of medicinal plants to treat certain human disease is depending on the type of diseases to be treated and age of person.

In the study area the effectiveness of a given medication depends up on the dosage to be administered and mostly quantified by number of seeds, number of leaves, drops of latex (sap), half of spoon, a spoon, a cup of tea, a glass were used to estimate the amount of remedies.

The amount of traditional medication used by a people is different in different route of application. For instance dosage with 1-2 spoonful powdered and 3-5 drops of latex remedies are prescribed for dermal application , while 1-2 cup are the most common amount of medication taken through oral route of application as information obtained from the informants. Likewise Dawit Abebe and Ahadu Ayehu (1993) reported that the absence of consistency dosage in traditional treatment of diseases.

In the study area, the biggest existing problem about traditional medicinal plant usage is the varieties amount of medication given by different healer (Appendix 3).

4.10 The Condition of used the medicinal Plants (fresh/dried) or both

As evidence from data shows (Table 6 and Appendix 3) most of the medicinal plants in Wombera District were used in fresh form (67%). Even though using of fresh medicinal plants have the chance of solving immediate problem of certain diseases elsewhere in the field, in other case it has negative effect, because during dry season when there is no availability of fresh plants, especially very small plant did not appear, therefore the local community met problem of medicinal plants due to seasonal diversity.

As far as my knowledge, it is advisable to use medicinal plants both in fresh and dry condition to alleviate seasonal problem of diseases. The second condition of plant used by local people is dried plant, which is 19%. In contrary to this finding the finding of Etana Tolossa (2007), indicated that the condition of plant part were used in fresh or dried (both), which indicates the chance of using the medicinal plants under different seasons of the year is maximized.

Table 6: The condition of using medicinal plants (dried or fresh) or both

No	Condition	Numbers	percentage
1	Fresh plant	61	67%
2	Dried plant	17	19%
3	Both tried and fresh	13	14%
4	Total plant	91	100

4.11 Major human diseases and the corresponding number of plant species used

In Wombera district a total of 55 human diseases and health problems were identified excluding animal diseases (Table 7) which were treated by using ninety-one medicinal plant species recorded. Among these, 12 diseases (21.8%) each was only treated by one species of medicinal plants. This indicates that the chance of healing a certain health problem in the study area is only by one medicinal plant species. While 11 diseases were treated by two species of medicinal plants, 10 diseases were treated by three species of medicinal plants and 22 diseases were treated by more than 3 to 16 medicinal plant species. This shows that there is high chance of healing a certain diseases by a number of medicinal plant species in the study area.

Accordingly wound was treated by using 16 number of medicinal plant species which has the largest number of medicinal plants. Placenta retention was treated by nine medicinal plant species and the second dominant medicine in the area (Table 7). Tuberculosis, Typhoid, Elephantiasis, cholera, Bloody urine, bladder pain and overweight each was treated only by one medicinal plant species in the District. Therefore, in most case local community prefer modern medication than traditional medication for these disease.

Treatment of a disease by using a number of medicinal plants indicates that there is easy availability of medicinal plants in study area. Likewise Endalew Amenu (2007 did similar study. Placenta retention was treated by medicinal using more than one plant species in Ejaji area, west shoa.

Table 7: Ailment types and a number of medicinal plants that treats both human and Livestock ailments in the study area

No_	Ailment type	No of medicinal plants treat the	No	Ailment type	No of medicinal plant
1.	Gonorrhea	5	29	Febrile illness	4
2.	Ring worm	5	30	Constipation	5
3	Wound	16	31	Headache	5
4.	Diarrhea	7	32	Liver disease	2
5.	Hepatitis	7	33	Tape worm	3
6.	Tooth infection	6	34	Asthma	2
7.	Swellings	5	45	Tryposis	3
8.	Tonsillitis	4	36	Breast cancer	2
9	Evil eye	5	37	Eye infection	3
10	Scabies	3	38	Male impotency	2
11	Common cold	6	39	Tuberculosis	1
12	Stomach ache	7	40	Leishmanesis	1
13	Snake bite	6	41	Body itching	1
14	Spider poison	3	42	Anemia	2
15	Black leg	3	43	Typhoid	1
16	Delivery problem	10	44	Elephantiasis	1
17	Wart	5	55	Contraceptive	1
18	Kidney daises	2	46	Bloody diarrhea	2
19	Rheumatic	2	47	Cholera	1
20	Ascribes	2	48	Over weight	1
21	Fire burn	2	49	Bloody urine	1
22	Worm	4	50	Ear problem	1
23	Rabies	3	51	Bladder pain	1
24	Amoeba		52	Tick	1
25	Evil sprite	3	53	Bleeding skin	1
26	Anthrax	3	54	Leech	3
27	vomiting	4	55	dandruff	3
28	Mumps	2	56	malaria	1

4.12 Source of medicinal Plants

Analysis of the source of medicinal plants showed that wild plants were the main sources of medicinal plants in wombera District (Figure 4, Appendix 4 and 5). Out of 91 medicinal plants collected, 58(64%) were collected from wild, 30(33%) is cultivated while 3(3%) is both cultivated and wild plants in the study area.

The majority of medicinal plants are harvested from wild habitat indicate that for the future there is negative influence on wild plant species. Because local people have no habits of cultivating medicinal plants around their home garden in order to keep their security of medicine. Therefore, this may cause local extinction of medicinal plants and indigenous knowledge. Likewise, Zemedede Asfaw (1997), Mirtsue Giday (1999), Bayafer Tamene (2000) and Endalew Amenu (2007) have reported the dominance of wild collection their works on medicinal plants.

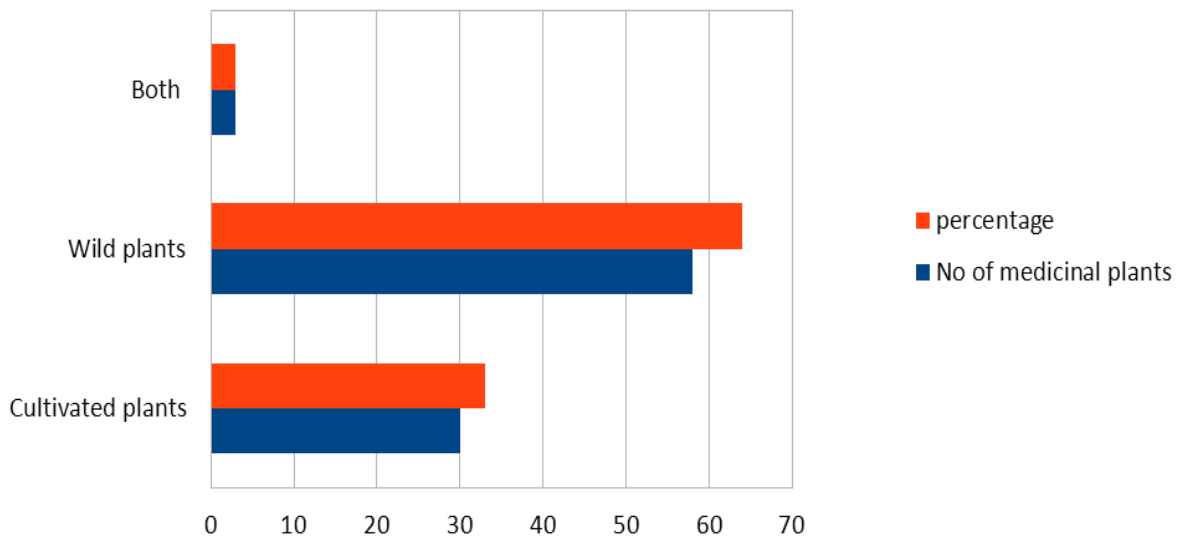


Figure 4: Habitats of medicinal plants in percentage and numbers.

4.13 Medicinal Plant species used to treat Livestock ailments

Medicinal plants have their great role in the treatment of livestock ailments besides to treatment human ailment. The indigenous person of the current study area used varieties of plant species to treat their livestock. Even though there are ethnoveterinary medicine in the study area, the local people uses their indigenous knowledge medication, when the disease is beyond the ability to overcome it. Therefore out of 91 total medicinal plant species documented in the study area, a total of 31 (34%) of plant species are found to be used in the treatment of livestock disease (Table 2) of those listed above 7 species of medicinal plants are only used for treatment of livestock diseases.

The species are distributed in 15 genera and 14 families in which families of *Asteraceae*, 9.6% (3 species) is the highest species for treating livestock diseases in the study area and following by *Myrsinaceae*, *Cucurbitaceae*, 6.5% (2species each). while *Brassicaceae*, *Solonaceae*, *Rubitaceae*, *Arecaceae*, *Euphorbiaceae*, *Thymelanceae*, *Meliantheaceae*, *Utriceaciae*, *Apocyanaceae*, *Acanthaceae*, *Rosaceae*, *Aloaceae*, *Rhaminaceae*, *Bigononiaceae*, *Canellaceae*, *Olaceae*, *Loganiaceae* and *Zingibiraceae* have one species for each, 3% to treat livestock diseases in the study area. Therefore they are the least used medicinal plants for treat of livestock in the study area (Table 2).

As analysis of data tells as about 51%, 16 species of medicinal plants used to treat livestock were harvested from wild species of plants, where as 38.7%, 12 species of medicinal plants to treat livestock were harvested from home garden (cultivated), while 9.6%,3 species are harvested from both wild and cultivated habitats.

On the analysis of their growth form (habit), the herbs are the most dominant medicinal plant

used in the study area followed by shrubs to treat livestock (Figure 3).

4.14 Medicinal Plants Knowledge versus level of age

Even though the first age groups of informants gave information of ethnobotanical during interview to collect data, there was problems of giving fully information like mode of preparation, dosage and plant part used as well as the local name of plants as compared to other age groups.

The use knowledge analysis showed that it is directly proportional to age increment with slightly decreased at last age (Table 8). This is agreeing with that of Abiyot Berhanu (2002) in which elders at higher ages reflects less medicinal plant use knowledge than adult age groups. However, disagrees with Debella Hundie (2001) and Tigist Wondemu (2003) that reports medicinal plant knowledge is increased with age. In the study area, most of the informants that were found above the first group gave full information about local name, parts of plant used, mode of preparation and they reported more medicinal plants than the first age groups (Table 8).

Table 8: Use knowledge of medicine compared with age groups of people

Numbers	Age grouping	No of informants	Total plant cited
1	18-20	8	10
2	21-30	11	20
3	31-50	12	24
4	51-85	20	37

4.15 Ranking of medicinal Plants

4.15.1 Informant consensus

One way of checking the effectiveness of a given plant species is by using informant consensus. According to the information given by main local people in the study area about the curative medicinal plant ranks, *Allium sativum* was reported by 30 informants (57.7%) to be predominantly used in treatment of Diarrhea, tuberculosis, common cold, body itching and malaria. Similar finding was reported by Jensn (1981) ; Getachew Addis *et al.*, (2001); Abiyot Brihanu (2002) and Ermias Lulekale (2005).

The second popular plant species that are used for treatment of disease in the study area is *Croton macrostachyus* that is cited by 28 (40%), followed by *Carissa spinarum*, 27(38.6%), *Cordia africana* 26,(37.1%), *Bersama abyssiniyca* and *Lepidum sativum*, *zingibar officinale* 25(35.7%) for each; *Echinops kebercho Mesfin* and *pruns africana*, 24(34%) each, *Citrus limon*, 23(44%), *Ficus sur*, and *Vernonia anygdalina*, 21(30 %)each, *Justica schimperiana*, *Ruta chalepensis*, *Artemisia rehan*, 20(28.57%,)each, *zehneria scabra*, 19(27.1%), *Aloe species* and *Brucea antidysenterica*,18(25.7%)each *Erythrina abyssinica* and *Carica papaya*, 17(24.3%)each, *Carissa edulis*, 16(30.7%), *Eucalyptus globulus*,14(20), *Ricinus communis* and *Grewia ferruginea*, 12(17%)each, *Arundiaria alpine*, which take 3rd to 15th ranks respectively (Table 9).

The *Croton macrostachyus* has ability of healing disorders like Gonorrhoea, ring worm, wound, Diarrhea, hepatitis, and Evil eye. The utilization of such plant species by local people may be due long time experience and easy ways of availability of these plant species in their locality.

Table 9: List of some medicinal plant species reported by nine or more than nine informants

Plant species	Informants	%	Plant species	informants	%
<i>Croton macrostachyus</i>	28	40	<i>Echinops kebercho</i>	24	34.3
<i>Cordia africana</i>	26	37.1	<i>Ruta chalepensis</i>	20	28.3
<i>Bersama abyssinica</i>	25	35.7	<i>Allium sativum</i>	30	42.8
<i>Carissa spinarum</i>	27	38.6	<i>Zingiber officinale</i>	25	35.7
<i>Justica schimperiana</i>	20	28.57	<i>Gnidia glauca</i>	9	12.8
<i>Aloe species</i>	18	25.7	<i>Erythrina abyssinica</i>	17	24.3
<i>Pruns africaan</i>	24	34	<i>Grewia ferruginea</i>	12	17
<i>Ficus sur</i>	21	30	<i>Citrus limon</i>	23	32.8
<i>Brucea antidyscnerica</i>	18	25.7	<i>Vernonia anygdalina</i>	21	30
<i>Zehneria scabra</i>	19	27.1	<i>Aretemisia absinthium</i>	20	28.5
<i>Lepidium sativum</i>	25	35.7	<i>Carissa edulies</i>	16	22.85
<i>Carica papaya</i>	17	24.3	<i>Arundinaria alpine</i>	10	14
<i>Ecucalyptus globulus</i>	14	20	<i>Ricinus communis</i>	12	17

4.15.2 Preference ranking

Preference ranking is help to give plant species of various type used for treatment of single ailment. So indigenous people shows the preference to word the best plants species of the basis of healing wound (Table 10) shows *Aloe species* to be the most preferred plant species and *Coffee arabica* is second most preferred of wound healing. *Grewia ferruginous* is the third preference to heal wound and *Plantago lanceolata*, *Stephanaia abyssinica*, *Ensete ventricosum*, *Guizotia scaba*, *Ficus sur* and *Pruns africana* are ranked from 4th, 5th, 6th, 7th, 8th, and 9th respectively.

Table 10: Preference ranking of nine selected medicinal plants based on healing wound by nine Key informants selected from different sampling sites

Species	Respondents										Rank
	R1	R6	R8	R14	R23	R26	R44	R51	R29	Total	
<i>Grewia ferruginea</i>	4	4	5	3	4	3	4	4	5	36	3 rd
<i>Prunus africana</i>	1	3	3	4	2	1	2	2	1	19	9 th
<i>Ficus sur</i>	2	3	2	1	1	4	2	3	2	21	8 th
<i>Enset ventricosum</i>	3	5	3	4	4	3	2	3	2	29	6 th
<i>Coffea arabica</i>	5	4	4	3	5	4	5	4	5	39	2 ⁿ
<i>Stephania abyssinica</i>	3	3	4	5	3	4	4	3	4	33	5 th
<i>Plantago lanceolata</i>	4	3	4	4	5	3	5	4	3	35	4 th
<i>Guizotia scabra</i>	2	3	5	2	3	2	4	3	2	27	7 th
<i>Aloe species</i>	5	5	4	4	5	5	4	5	3	40	1 st

Key: 5 is the best, 4= very good, 3=good, 2=less, 1= least Of the values.

Also a given plant species is used in the treatment of the different ailments. Therefore, local people show preference towards plant species having healing capacity of different ailments. Preference ranking carry out by seven key informants selected for seven selected medicinal plant species(Table 11) on the bases of healing (treating) different ailments showed that *Carissa spinarum* is the most preferred in healing (treatment) placenta retention followed by *Brassica carinata* which the most second powerful to expel placenta. Endalew Amenu (2007) did similar finding. Additionally *Justica schimperiana*, *Albyzia gumifera*, *Linum usitatissimum*, *Grawia ferruginea*, and *Dracaena steudneri*, were 3th, 4th, 5th, 6th, and 4th respectively based on the potential to expel placenta.

Table 11: Preference ranking of seven selected medicinal plants used to expel Placenta

Species	respondents											rank
	R ₁	R ₆	R ₈	R ₁₄	R ₂₃	R ₃ 9	R ₄₀	R ₄₄	R ₂₆	R ₂ 9	Total	
<i>Carissa spinarum</i>	5	4	5	5	4	4	5	5	5	5	47	1 st
<i>Justica schimperinata</i>	5	4	3	4	3	4	5	4	3	4	39	3 rd
<i>Brassica carinata</i>	4	5	4	4	5	4	5	5	4	5	45	2 nd
<i>Grawia ferruginea</i>	1	2	3	4	5	3	4	2	1	2	27	6 th
<i>Albizia gummifera</i>	3	4	3	4	3	3	4	5	2	3	34	4 th
<i>Linum ustitatissimum</i>	2	5	4	3	2	3	4	2	2	3	30	5 th
<i>Dracaena steudneri</i>	2	1	2	3	1	1	2	3	2	1	18	6 th

Key: 5 are the best and 1 is the least value of the criteria.

4.15.3 Direct matrix ranking

A part from medicinal value, plant species are utilized for multipurpose. Direct matrix rank analysis (Table 12) is used to show preferable multipurpose use of a plant species. Accordingly, nine multi-purposes species were selected out of the total medicinal plants, eight use categories were listed, and eight selected key informants to assign use values to each species. Each use category was summed up for all of the ten plant species to rank them.

Based on the direct matrix analysis, *Cordia africana* is found to be highly used by the local community for multi-purpose, followed by *Eucalyptus globulus*, *Pruns africana*, *Carrisa spinarium*, *Vernenia amyedalina*, *Croton macrostachyus*, *Erythria abyssinica*, *Grewia ferruginea*, *Allium sativum* & *Justica schimperiana*, at 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, & 10th respectively. This is disagree wth Etana Tolossa (2007). Therefore, the multiple purposes

(utilization) of these plant species for different purpose made local extinction of these species.

Therefore, the future existence of such highly treated plant species is in doubt if not all the concerned bodies do not take measurement example, a forestation, wisely use of natural resources, give awareness about the danger of extinction of natural resources (plant species, which is our life). The least used plants for multi-purposes have a chance to be conserved, because the lower potential they have to be utilized for multi-purpose.

Table 12: Direct matrix analysis of selected medicinal plants based on multi-purposes

Species	Use-value (category)									
	Medicine	Forage	Food	Firewood	Constructions	Fencing	Furniture	Charcoal	Total	rank
<i>Carissa spinarum</i>	9	8	8	5	0	7	0	5	42	4th
<i>Coridia africana</i>	9	8	8	8	7	6	8	6	60	1st
<i>Croton macrostachyus</i>	9	0	0	8	0	7	0	5	29	6
<i>Allium sativum</i>	9	5	9	0	0	0	0	0	23	9th
<i>Erythrina abyssinica</i>	8	0	0	0	0	9	5	5	27	7th
<i>Pruns africana</i>	8	5	0	8	6	7	5	7	46	3rd
<i>Vernonia amygdalina</i>	7	8	0	7	0	5	0	5	32	5th
<i>Grewa ferrginea</i>	7	5	0	5	0	9	0	0	26	8th
<i>Eucalyptus globulus</i>	8	5	0	9	9	9	6	8	54	2nd

Key: 10-best, 9-very good, 8-good, 7- less used, and 0-not used.

4.16 Threats to medicinal Plants in Wombera District

Ranking factor on the threats of medicinal plants by five selected key informants (Table 13) showed that the most common threats in the study area were agricultural encroachment (26.8%) and the followed by over exploitation (21%), firewood collection (19.7%), over grazing (15.5%) medicinal plant harvesting and drought (8.5%) each.. Furthermore, disaster like burning of forest by fire can kill some of very young and mother plants. These factors take their own share in the decrement of abundance and diversity of medicinal plants from the study area. Similarly Ermais Lulekal *et al* (2008) cited that deforestation and agricultural exploitation are the most treating factors in Mana Angetu District.

Ethiopia traditional medicinal has faced a problem of continuity and sustainable as elsewhere in Africa (Ensermu Kelbesa *et al.*, 1991). Evidence shown that many plant species globally are threatened with extinction owing to extensive deforestation, urbanization and drought that cause for the loss of habits of medicinal plants and there by the loss of indigenous knowledge (Kebu Balemie, *et al.*, 2004). Likewise, lack of awreness of cultivating habit of medicinal plants in their home garden by the local people and deforestation due to time-to-time population increments can causes the threats of medicinal plants in the study area.

Table 13: Ranking of factors that cause decrement of abundant and diversity of Plants

Threats	Respondents								
	R6	R 39	R 40	R 44	R 51	Total	Mean	%	Rank
Agricultural	4	3	4	4	4	19	3.8	26.8	1 st
Over exploitation	4	3	2	3	3	15	3	21	2 nd
Fire wood collection	3	2	4	2	3	14	2.8	19.7	3 rd
Over grazing	2	3	3	2	1	11	2.2	15.5	4 ^t
Medicinal plant harvesting	1	2	1	1	1	6	1.2	8.5	5 th
Drought	1	2	1	1	2	6	1.2	8.5	

Criteria: 4- the most, 3- more 2- less and 1-the least used.

4.17 Conservation of medicinal Plants

Conservation on threaten medicinal plant is achieved through in- situ conservation on their natural habitats like nature reserves and parks and ex-situ conservation is conservation in fields gene banks, seed banks & botanical gardens (Cunningham, 1996).

Cultural beliefs like harvesting of medicinal plants on only restricted days on Wednesday and Friday can conserve the medicinal plants. In addition to some extent, religious can conserve medicinal plants. For instance, people in order cannot cut plants around the churches easily, which is help full for conservation of plant life.

By giving awareness creation for local peoples seedling plantation of indigenous species

(endemic trees) rather than exotic tree plantation program in every year continuously during rainy season. Because endemic trees have, more survive the climatic conditions and soil of the area. Developing habit of cultivating medicinal plants in their home garden like other crops by the local people is one of the choices of conservation methods.

5 CONCLUSIONS

- The biggest problems of traditional medicinal plants were the precise dosage. Because variety of healers used different dosage.
- The ability of local communities in cultivating and conserving medicinal plants in home garden is low. Since most of the medicinal plant were harvested from wild.
- The local communities have high capability of healing variety of ailments by a numbers of medicinal plants. This indicates that indigenous knowledge is basis for all generations especially for young generation.
- The threats of plants due to utilization of medicinal purposes are low compared to the other use categories. Because mainly the local people used plant, parts for remedies are the leaves that do not affect the whole plant.
- The major threats of plants and particularly medicinal plants of the study area are deforestation for agriculture.
- The highest habits of medicinal plants were harvested from herbaceous. Therefore, the local communities meet Problems of medicinal plant availability on seasonal diversity, especially during dry season.
- The young generations have less interest of knowing the indigenous knowledge. Because the first age group knows rarely the local name of plants.

6 RECOMMENDATION

Based on the result of the study, the following recommendations were forwarded:

- The whole community should be use modern medication that has precise dosage.
- All the concerned bodies should be encouraging people to grow medicinal plants around their home garden.

Because much of medicinal plants used for treatment both human and livestock were collected from wild habitats.

- The government should be allocating budget to reward known traditional healers to keep sustainability of Indigenous knowledges. Because they did not tell their indigenous knowledge easily.
- To alleviate seasonal diversity problems, the local community should be used medicinal plant species both in fresh and dry. Because herbs do not appears during dry season.
- The chance of extincted multipurpose of highly used medicinal plants in the study area is high, if the whole Community should not participate in the conservation strategy of medicinal plants.
- All community should be participating in indigenous tree plantation program, especially medicinal plants in order to remove the threats to medicinal plants and indigenous knowledge.
- The concerned bodies should be allocating ample budget for researchers to extract modern drugs from plants.

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8 APPENDICES

Appendix -1a: Kiitsa- 1a (shinashigna language)

Aatotsi badiyar kakuwosh wotit informeshniyotsinat byatse keewosh wotituwotsi beezuweer.

Jam informeshin aniyituwotsi:

Shuutsa-----

Nata-----

Sota-----

Danishira-----

Kora-----

1. Shoodonat btuuwo Akalitin nodanit?
2. It galotse beyiru ashonat gizotsi shoodts keewuwere?
3. Shoodani bazyosh wotit sheeto faa? Boshuutso seeri.
4. It galotse ati hanotsi egi eriniya seegey?
5. mit atsi kayutse atish wotituwo awune ?(sapa, maara, ginda, funda)jam mit atsi kayel?
6. Akaaliniya finats it jitsifo?
 - a. gufiya, tiishiya, dia, krta,suwiya, wokin koshi weerona-----
 - B.Akowona finatsi it jitsit (bshukonemo bmotse woin gitone)?
7. Eegine dekefo (gokionemo, shintionem, nononemo, waazone---)?
 - a. ati mani dekewor egatse tatsefo(baatso wokin ayiyo egin daneefol) ambts aawoshe
- Dekefo?
8. Atiman dekewor bnton deko geyerawu kosh meeyeyit nat ushet narots egino?
9. Ati man dkewor ashats bbetsit mido faa? Fae wotala egikalo geyife?

10. Andishnat shinomandsh ati man egi bwotitetatni nivaloke ngawit?
11. Ati hanots dekwosh bazit makuwotsi faino nagaloke?
12. Ati mankalo shengsh danitsots ambits natatse beyiruwotshe?
13. Akalitini kosh jirosh beshiyo faleyet?
14. Ati manoti botiafituwokio kaliti keewotsi egino?
 - a. Shino mandish egi kialo giyituwa?
 - b. Atimanotsi botiafirawokiwosh nokialit kioh malo faia?
15. Ngalotse beyiru kioh kioh mit narotsi akalitin nkayit?
16. Shawi narotsi akaialitini nkayit?
 - a. Shawa?
 - b. Datsi beyi beyotsi?
17. Kioh nidabit ndantsi keewo bbeyat deshi hanats beezwer-----

Appendix-1b: List of questionnaire used as basis for interview and discussion to gather information.

General information of respondents:

Name.....

Age.....

Sex.....

Educational status-----

Village-----

- 1 How do you understand healthy and the causative agent of disease
- 2 How do you classified
 - a. Soil?
 - b. Landscapes traditional?
 - C. How do you categorize vegetation traditionally in your area?
3. List some of human and livestock ailment in our locality
4. Are there medicinal plants, which you use to treat human and livestock or both health Problems? List some of them.
5. What is the local name of these medicinal plants?
6. Which part of the medicinal plant is used for treatment of disease (root, leaves, stem, and flowers? Sap (latex) or the whole plant parts)?
7. How do you prepare these medicinal plants?
 - a. Decoction (boiling), crushing, powdering, chewing, fumigating, inhaling or if other Method-----
 - b. Do you use alone or mixed with water or other compounds or mixed with other

medicinal Plant?

C. In what condition (dried, fresh or both)?

d. What is the route of administration (Dermal, Nasal, oral, ear canal...)?

e. What is the Dosage used? For how many day used?

8. Is there side effect of the medicine on user? If yes, what measurement, you should take?

9. What is the current and future situation of medicinal plants in our locality?

10. Are there any beliefs linked with the utilization of medicinal plants in your locality?

11. Which age range is knowledgeable about medicinal plants (young, adult, old)?

12. Is the local community willing to pass dawn their medicinal knowledge's to, the next generation? How does the knowledge transfer?

13. What are the major threats of medicinal plants in your locality?

a. If so what do you think for the future?

b. Is there any measurement do you take to conserve medicinal plants?

14. Additional if you have another idea you can list here?

.....
.....

Thank you!

Appendix 2: Lists of informants involved in medicinal plant study randomly selected from ten Villages

No_	Name of informants	Villages	Age	sex	Educational status
	Bayissa Alega shiewo *	Gocher	65	M	0 class
1	Belachew Tafera	Adise alem	20	M	12 complete
2	Hika Geleta Dano	Chancho	23	M	12 complete
3	Bifitu Merewa	Babo	70	M	0 class
4	Bejelo Seyeum	Chancho	60	M	0 class
5	Siliesh Beyene *	Gocher	35	M	Diploma
6	Lemessa Bayisa	Gocher	20	M	Grade 11 th
7	Abera Ejeta	Kitar	80	M	0 class
8	Melaku Terefa	Kitar	42	M	Grade 6 th
9	Bekaham Kumera	Ebach	19	M	12 th complete
10	Sukare Etana	Gocher	29	F	0 class
11	Debesie Ferede	Babo	76	F	0 class
12	Tarekgn Kenaw	Babo	56	M	Grade 4
13	Welella Fekeda *	Chancho	19	F	10 complete
14	Gessesse Ayana	Gocher	43	M	Grade 6 th
15	Neché Tolossa	Ebichi	18	F	Grade 9 th
16	Nigatu Gobena	Debrezyit	29	M	Degree
17	Yenensh Aschale	Ebich	18	F	Grade 9 th
18	Feyisa Geleta *	Babo	25	M	10 complete
19	Endualum Amare	Gocher	55	M	0 class
20	Tesfaye Tolosa	Ebich	30	M	Degree
21	Bijidu Etana	Kitar	42	F	Grade 1
22	Geleta Desasa	Babo	60	M	Grade 4
23	Ayeru Fekadu	Deberzyit	20	M	12 complete
24	Amesaye Bejele	Chancho	22	M	12 complete
25	Alade Moti *	Gocher	85	F	0 class
26	Teshale Wakijira *	Ebach	24	M	12 complete
27	Maru Delelaw	Gocher- 01	68	M	1 class
28	Lemessa Kenaw *	Kitar	50	M	Diploma

29	Yaregal Tarekegn	Deberzyit	22	M	12 complete
30	Melkitu Gemeda	Gocher	50	F	0 class
31	Jiratu Delawo	Gocher	60	F	0 class
32	Nigatu Mekonen *	Gocher	21	M	12 complete
33	Eba Geleta Bachew	Adise Alem	26	M	10 complete
34	Aboma Ejegra	Gocher	22	M	Grade 11 th
35	Egigu Alemayehu	Gocher	62	M	0 class
36	Aleme Gessesse	Menesebu	20	F	Grade 10
37	Tarekegn Alemu	Kitar	35	M	0 class
38	Melese Emiru *	Menesebu	44	M	Grade 9 th
39	Kelebesa Bose *	Zematyia	62	M	0 class
40	Amisalu Deressa	Gocher	50	M	Grade 2
41	Fekeda shimo	Debrezyit	37	M	Diploma
42	Worknesh Ferede	Gocher	62	F	0 class
43	Jira Bushen *	Gocher	85	M	0 class
44	Asefa Alemu	Debrezyite	52	M	Degree
45	Yihun Kassa	Menjo	67	M	0 class
46	Workinsh Kuma	Debrezyit	50	F	0 class
47	Ayantuu Morki	Menjo	65	F	0 class
48	Tesso Debella	Debrezyit	75	M	Grade 2
49	Jalene Worku	Kitar	48	F	Grade 4
50	Tesfaye Gudata *	Adise Alem	29	M	Degree
51	Melkamu Meredasa	Debrezyit	30	M	Degree

52	MekonenKesesa Rekitu	Menijo	35	M	Diploma
53	Mulualem Habite	Ambifeta	30	M	Diploma
54	Zewide Wodaje	Dberezyit	67	M	0 Class
55	Milion Demeki	Ebach	33	M	Degree
56	Ayifokiru Wondifrash	Debrzyit	42	M	Degree
57	Lemessa Tariku	Zematzyia	55	M	Grade 2
58	Temesgen Kebede	Zematyia	43	M	Grade 1
59	Ayeru Negewo	Menesebu	39	M	Diploma
60	Shumata Gudeta	Menijo	52	M	Grade 6
61	Mesere Aregeta	Ambifeta	26	F	Grade 12
62	Mekael Kebede	Ambifeta	22	M	Grade 10
63	Shimo Dano	Menesebu	70	M	0 Class
64	Tuji Negassa	Menesebu	45	M	Certificate
65	Esho Alega	Deberezyit	51	M	Diploma
76	Alemushi Morke	Chancho	49	F	0 Class
67	Shumete Etana	Gocher	45	F	0 Class
68	Yaden Chale	Ambifeta	58	F	0 Class
69	Kebetu Dide	Zematyia	47	F	0 Class
70	Ayeru Bayissa	Kitar	40	M	Grade 6

NB: *- Indicates key informants in the study area.

There were 20 key informants (14 males and 6 females) that were selected

Appendix3: Description of medicinal plants used for treating human and livestock ailments, plant part used, method of preparation, route of application,

dosage used, scientific name, family name, English name, Local name, Habitat and Habits.

Key: Tree-T, Shrub-sh, Herb-H, Lianas -Li, Epiphyte -epi, Climber-CI, Bushland -Bl, Grassland -Gl, River and Wetland- Ri, Forest area-Fa, Plant part used - PPU, Route of application-Ra, (oral-or, dermal- der, Dental-de, Nasal-Na, optical-op, ear canal -Ec,), condition used -Cou(fresh plant -Fp, Dry plant -Dp), Livestock-LS, Human -Hu, Leaves-L, stem-St, Bark-B, latex(sap)-La, Fruit -Fru, Whole plant -Wh, Seed-S, Bulb-B, Cultivated-Cu, Wild -W.

Scientific name	Shinashigna name	Family name	English name	Ha	Hb	Used for	PPU	Cou	RA	Ailment type	Preparation and application
<i>Corton macrostachyus</i>	Baroha	<i>Euphorbiaceae</i>	Broad leave croton	T	Bl, W	Ls	L	Fp	Or	Infection of tounge	Leaves of <i>Corton macrostachyus</i> and bulb of <i>Allium sativum</i> pounded together and given for cattle a day.
						Hu	R	Fp/Dp	Na	Evil eye	Roots of <i>Corton macrostachyus</i> and <i>Carissa spinarum</i> chopped together and fumigated.

						Ls	L	Fp	Der	Scabies	Leaves of <i>Corton macrostachyus</i> with Leaves of <i>Brucea antidysentrica</i> crushed together and used as skin wash for calf.
<i>Corton macrostachyus</i>	Baroha	<i>Euphorbiaceae</i>	Broad leave croton	T	BL, W	Hu	L	Fp	Der	Hepatitis	Apply on affected area
						Hu	L	Fp	Der	Teeth	Juvenile Leaves crushed with salt and inserted in affected teeth.
						Hu	L	Fp	Der	Swelling	The Juvenile Leaves heated in fire and apply on the swelling area.
						Hu	B	Fp	Or	Tonsillitis	Crushed the root bark, homogenized in water and drink 1 cup a day.

						Hu	L,B,R	Fp	Or	Gonorrhea	Juvenile Leaves or bark of <i>Croton macrostachyus</i> is roasted with meat and taken 1 glass for three days.
						Hu	L	Fp	Der	Ring worm	Leaves are crushed and the extract is creamed on affected area.
						Hu	B	Fp	Der	Wound	Bark is dried powdered and add on wound.
						Hu	R	Fp/Dp	Or	Diarrhea	Crushed, powdered and homogenized in 1 cup of water. Then drink once.
<i>Cordia africana</i>	Banija	<i>Boraginaceae</i>	Sudan teak, large Leaved cordial	T	CU, W	Hu	L	Fp	Or	Common cold	Crushed, roasting then drink ½ cup for a day. Fumigated juvenile Leaves.
						Hu	R	Fp	Or	Stomach pain	Roots of <i>Cordia africana</i> with roots of <i>Carissa spinarium</i> crushed and homogenized in water. Then drink 1 glass for a day.

						Hu	R	Dp/Fp	Or	Snake bite	Roots of <i>Cordia africana</i> Crushed, powdered, and homogenized in water and drink 1 cup.
						Hu	L	Fp	Der	Spider poison	Leaves of <i>Cordia africana</i> are burned and the remaining ash mixed with butter and creamed on affected skin.
						Hu	L	Fp/Dp	Or	Hepatitis	Leaves of <i>Cordia africana</i> boiled with sorghum and drink one cup for 2 days.
<i>Cardus leptanthus</i>		<i>Asteraceae</i>	?	H	W	Ls	R	Fp	Or	Black leg	Roots grinding along with salt and give for cattle during problem for 3 days.
						Ls	R	Fp	Or	Placenta retained	Grinding the root with salt and give for cattle up to a glass.
<i>Gnidia glauca</i>	Kakarra	<i>Thymelaceae</i>	?	Li	W	Hu, Ls	R	Fp	Or	Diarrhea	Root crushed, grinding and drink 1/3 of cup with tea or butter once a day for human but given for cattle with salt.
<i>Gnidia glauca</i>	Kakarra	<i>Thymelaceae</i>		Li	W	Hu, Ls	R	Dp/Fp	Der	Wart	Repeatedly burn on swelling area.

						Hu	R	Dp	Or	Kidney disease	Grinding the root and mixed with powder of teff then backed and eaten by human.
<i>Bersama abyssinica</i>		<i>Melianthaceae</i>	Winged bersama, Abyssinica	T	W	Hu	L	Fp	Or	Abortion	Cooked Juvenile Leaves (boil) and drink a cup.
							St	Fp/Dp	Der	Rheumatic	Warming on fire and apply on affected area.
							L	Fp	Or	Cholera	The leaves mixed with <i>Croton macrostachyus</i> and crushed together. Then drink a cup by dissolving in water.
							R	Fp	Or,Der	Hepatitis	Grinding the tip root and put on affected area or drink by homogenizing in water.
							Hu	R	Fp	Dental	Teeth disease
						Ls	L	Fp	Or	Ascaris	Boiling the Juvenile leaves and give for calf.
							R	Fp	Der	Pest control (ecto parasite)	The root is pounded and spray on cattle skin to kill fleas.

<i>Urtica urens</i>	Kushi	<i>Utricaceae</i>	nettle	H	W	Ls	R	Fp	Der	Donkey wound or fire burn	Grinding the roots and apply on wound day to day for three days.
						Hu	L	Fp	Der	Hepatitis	The juvenile leaves crushed and apply on the affected area.
<i>Carissa spinarium</i>	Awa	<i>Apocyanaceae</i>	karanda	Sh	W	Hu	St	Fp	Or	To expel placenta	Pounded the stem, mixed with water and drink a glass.
							R	Fp/Dp	Or	Gonorrhea	Grinding and homogenizing in water. Then take with soap of meat for three days.
							R	Fp	Or	Stomach ache	The roots pounded with <i>Cordia africana</i> and mixed with honey then take 2 spoons in the morning.

						Hu	S	Fp/Or Dp	Or	Intestinal parasite (worms)	15-20 seeds of <i>Carissa spinarium</i> roasting and eat it.
							R	Dp	Na	Evil eye	Fumigate to patient or inhale the smoke root of <i>Carissa spinarium</i> .
						Ls	R	Dp/Fp	Or	Bloody diarrhea	Pounded the root with salt and give for cattle.
<i>Justica schimperiana</i>		<i>Acanthaceae</i>	forhand	S	W	Hu	L	Fp	Or	Expel placenta	Leaf is pounded and homogenized in water. Then take a cup during the problem.
							L	Fp	Or	Rabies	Sequined the leaf and give one cup for bitten person.
							L	Fp	Or	Hepatitis	Pounded the leaf and taken with tea in equal amount for 7 days.

						Ls	L,R	Fp	Or	Blackleg	The leaf and root is grinding with dried seed and fruits of <i>Ricinus communis</i> . Then homogenized in water and give 1 litter for cattle.
<i>Erythrina abyssinica</i>	Galiya	<i>Fabaceae</i>	Lucky bean tree, Red-hot poker	T	W	Hu	B	Fp	Or	For delivery	Pounded bark, homogenized in water and give ½ glasses for human during delivery problem.
							B	Fp	Dental	Tooth	Pounded the bark and apply on affected tooth parts.
								Fp	Or	Amoeba	Pounded and drink a glass with tella.
<i>Grewia ferruginea</i>	Koriya	<i>Tiliaceae</i>	White raisin	Cl	W	Hu	St	Fp	Der	Wound healing	Crushed the stem and apply on wound.
<i>Myrsine africana</i>	Muna	<i>Myrsinaceae</i>	Kurjan seed	H	W	Ls	R	Fp	Or	Blackleg	Pounded the leaf with salt and soot, then give for cattle.

						Ls	R	Fp	Der	To kill worm in wound	Grinding the roots and insert in the wound, it kill worm in the wound.
						Hu	R	Fp	Der	Spider poison	Pounded the root and apply on the affected area.
							L	Fp	Der	Evil eye	Grinding the leaves and painted on the face.
<i>Pruns africana</i>	Omiya	<i>Rosaceae</i>	Red stink wood. or Pygeum.	T	W	Hu	L	Fp	Or	Amoeba	Sequined homogenized in water and give 1 glass a day.
						Hu and Ls	B	Fp	Der	Wound healing	Pounded with salt and insert in wound. Then kill worm in wound in case of cattle.
<i>Aloe species</i>	Kompa	<i>Aloaceae</i>	Aloe	H	W	Hu	L, St	Fp	Der	Wound healing	Sap from leaves and stem creamed on wound consecutive for 3 days.
						Ls	R	Fp	Or	anthrax	Pounded, homogenized in water and 1 glass is given for cattle.
							L	Fp	Der	Wart	Worm on fire and apply on warty area.

<i>Ficus sur</i>	Essa	<i>Moraceae</i>	Fig tree	T	W	Hu	B	Fp	Or	Mumps strength gum and tooth	Pounded the park, boiled in water and washing mouth with it.
						Hu	S	Dp	Or	overweight	Grinding homogenized in water and give glass early in the morning for 5 days.
						Hu	L	Fp	Der	Wound bleeding	Juvenile leaves is crushed and creamed on affected area.
						Hu	epi	Fp/Dp	-	Evil spirit	Epiphyte of this plant is smoked.
<i>Artemisia rehan</i>	Shawa	<i>Compositae</i>	Ethiopian worm- wood.	H	Cu	Hu	L, St	Fp	Or	Amoeba	Pounded, homogenized in water. Then drunk 1 cup for 3 days.
							L, St	Fp	Or	Malaria	Pounded with <i>Allium sativum</i> and eat 2-3 spoons early in the morning.
								Fp	Na, Or	-Vomiting and Stomach ache	The leaf is crushed, homogenized in water and drink 1 cup or the leaf is sniffed to prevent vomiting.

<i>Citrus lemon</i>	Iomeya	<i>Runtaceae</i>	Lemon	Sh	Cu	Hu	fruit	Fp	Or	Vomiting	The volatile from this fruit is sniffed.
							fruit	Fp	Or	Head ache	Mixed with tea and drunk it
							B	Fp	Der	fungus	The sap is creamed on affected area.
							fruit	Fp	Der	dandruff	The fruit bark is creamed on affected area.
							fruit	Fp	Or	Stomach ache	The fruit of <i>Citrus lemon</i> , <i>Zinger officinale</i> and <i>bulb of Allium sativum</i> are pounded together and mixed with honey. Then eat it.
<i>Brassica carinata</i>	Toba	<i>Cruciferae</i>	Abyssinian cabbage Or Ethiopia mustard	H	Cu	Hu	L	Fp	Or	Remove constipation	The leaf is eaten once by decoction slightly.
							Hu	L,S	Fp/Dp	Or	Placenta retention

<i>Avena sativ</i>	Essa	<i>Poaceae</i>	Oat	H	Cu	Hu	S	Dp	Der	Allergic	Grinding, decoction and creamed on the skin with clean cloth.
									Or	Broken bone	Grinding, decoction, mixed with sugar and drink 1 glass every day until it heal.
<i>Euphorbia triucalli</i>	Ezimita	<i>Euphorbiaceae</i>	Cactus milkbush	Sh	W	Hu	La	Fp	Der	Ringworm -Wart	Creamed the sap by thinning on the skin.
									Hu	St	Fp
<i>Brucea antidysenterica</i>	Fabaceae	<i>Simaroubaceae</i>	baobab	Sh	W	Hu	B	Fp	Dental	Teeth infection	Pounded the bark root and apply on affected tooth
							R	Fp	Or	Swelling	Grinding the root, homogenize in water and take 2-3 cup for 3 days.
								Fp	Or	Snake bite	Pounded the root and homogenize in water. Then drunk 1 cup.

<i>Allopyllus macrobortys</i>	Ezana	<i>Sapindaceae</i>	Allopyllus cobbe	Sh	W	Ls	L	Fp	Der	Kill different worms	Crushed the leaves and apply on the affected area.
<i>Lagenaria siceraria</i>	Shedani mata	<i>Cucurbiaceae</i>	Bottle- gourd	Cl	Cu	Hu	S	Fp	Or	Rabies	Soaked the fruit in water and drunk a cup of bitter solution.
<i>Juniperus procera</i>	?	<i>Cupressaceae</i>	Juniper	T	Cu	Hu	R	Fp	Or	Tonsillitis	Pounded, homogenized in water and drunk ½ cup.
							Decade wood	Dp		Cough	Fumigated.
<i>Trigonella foenumgraecum</i>	Gira	<i>Fabaceae</i>	Fenu- greek	H	Cu	Hu	S	Dp	Or	To maintain harmed skin and remove constipation	Grinding stayed for 5 hour mixed with sugar or salt. Then drunk 1-2 glasses.
<i>Rhamnus prinoides</i>	Gesha	<i>Rhamnaceae</i>	Buck- thorn	Sh	Cu	Hu	S	Dp	Der	Tinea corporals	With the root of <i>Rumen nervosas</i> pounded together and painted on affected area.

						Ls	L	Fp	Or	Bloody urine	Grinding and give for cattle with residue of tella.
<i>Zehneria scabra</i>		<i>Cucurbitaceae</i>	Snake-Jamie	H, C	Cu, W	Hu	L	Fp	der	Hepatitis	Grinding and mixed with butter. Then creamed on affected area
							L	Fp	Or	Common cold Evil eye Febrile illness	With leaf of <i>Eucalyptus globules</i> fumigated by decoction.
							R	Fp	Der	To kill worm in wound	Crushed with salt and inserted in wound of cattle.
<i>Syzygium guineense</i>	Dakuwa	<i>Myrtaceae</i>	Water- pear or water boom	T	W	Hu	R, L	Fp	Or, Na	Stomachache, Tonsillitis and Common cold	-pounded, homogenized in water and drunk 1 glass once. -fumigated the leaf.

<i>Ensete ventricosum</i>	Balawarkiya	<i>Musaceae</i>	Inset	Sh	Cu	Hu	R	Fp	Der	Elephantiasis, Wound and Hepatitis	Crushed and apply on the affected area (skin).
<i>Vernonia amygdalina</i>	Gaa	<i>Asteraceae</i>	Bitter leaf	Sh	Cu, W	Hu	L	Dp	Or	Ascariasis, Diarrhea and Stomach ache	Dried crushed decoction and 1/3 cup is given for human.
						Hu	L	Fp	Or	Facilitate vomiting	Suddenly when person drunk it. Implies it remove toxic through vomiting.
						Hu	L	Fp	Den	Tooth infection	Chewed with the bulb of <i>Allium sativum</i> and salt.
<i>Carica papaya</i>	Papaya	<i>caricaceae</i>	Papaya	H	Cu	Hu	Sap	Fp	Or	Intestinal worm	¼ tea spoon sap with equal amount of honey and water mixed together. Then drunk it.
										Contraceptive	Eat 5 to 6 seed of <i>Carica papaya</i>

<i>Sterospermum kunthianum</i>	Sholaha	<i>Bigniniaceae</i>	Yellow snake tree	T	W	Hu	B	Fp	Or	Stomach ache	Pounded the bark, add little amount of water and drunk it.
							Root (B)	Fp	Den	Tooth infection	Crushed and inserted in the affected tooth.
							Ls	B	Fp	Or	Placenta retention
<i>Clematis simenisis</i>	Fete	<i>Ranunculaceae</i>	?	Cl	W	Hu	L	Fp	Na	Head ache	Squeezed the leaf and take 1-2 drops of sap.
<i>Albizia gumifera</i>	Muka-arba	<i>Fabaceae</i>	bushman	T	W	Hu	Sap	Fp	Or	Expel placenta	Squeezed the sap, mixed with honey and drunk 1 glass.
									Ear ca	Ear problem	2-3 drop of sap is added into ear canal.
<i>Lepidium sativum</i>		<i>Brassicaceae</i>	Garden cress	H	Cu	Hu	S	Dp	Or	Ascariasis	Grinding the dried seed, homogenized in water and sugar. Then drunk 1/3 of cup.
							Ls	S	Dp	Der	Fibril illness

<i>Trclea nobilis</i>	Adesa	<i>Rutacesae</i>		T	W, Cu	Hu	L	Fp	Or	Liver disease	Grinding 2-3 leaves and drinks with tea for a month.						
<i>Datura stramonium</i>	Hidia	<i>Solanaceae</i>	Thorn apple	H	W	Hu	L	Fp	Or	bladder pain and stomach ache	Take ½ leaves with 8-10 spoon of water and mixed together and stayed for one day. Then give 5 drops for adult in four time interval.						
												W	Hu	L	Fp	Der	Teania peddis (dandruff)
<i>Phytolacca dodecandra</i>		<i>phytolacaceae</i>	Ended	Sh	W	Hu	S	Fp/Dp	Or	Tape worm	¼ tea spoons are crushed mixed with honey and give for an affected one.						
													B	Fp	Or	Gonorrhea and Syphilis	Pounded the root bark and 1/3 cup is given for affected one.
													L,S	Fp	Der	Scabies	Pounded and wash the skin with it.
<i>Rumex nervoseus</i>	Gulia	<i>Polygonaceae</i>	Bitter dock	H	W	Hu	L	Fp	Der	Worms (gekoa)	Warm on fire and burn on affected area.						

<i>Eucalyptus globulus</i>	Natsa nkakiltia	<i>Myrtaceae</i>	Blue gum, Fever tree	T	Cu	Hu	L	Fp/Dp	Na, Or	Febrile illness and Common cold	Fumigate to patient with the roots of <i>Echinops kebercho Mesfin.</i>
										Asthma and Tiena pedis	Crushed the leaves and fumigated. Wash the leg with its leaves.
<i>Dracaena studeneri</i>	Sheti gulia or Toba	<i>Araliaceae</i>	Night fighter tree	T	W	Hu	B	Fp	or	To expel placenta	Crushed the leaf, homogenized in water and drunk 1 glass once.
<i>Warburgia ugandensis</i>	?	<i>canellaceae</i>	Pepper bark tree	T	W	Hu, Ls	B	Fp	Or	Stomach ache Trypsis (Gandia)	Grinding, homogenize in water and give for both cattle and human.
<i>Maesa lanceolata</i>	Abayia	<i>Mrsitaceae</i>	False assegai	Sh	W	Ls	S	Fp	Or	kill leech	Pounded and added to stagnate water. Then the leech in it dies.
<i>Coffee arabica</i>	Bunia	<i>Rubiaceae</i>	Coffee	Sh	Cu	Hu	S	Dp	Der	wound	Grinding the dried seed and sprayed on wound.

								Dp	Or	Breast cancer	Grinding, decoction and drunken 3-4 cup per a day.
								Dp	Or	Diarrhea	Roasted and eaten for 3 days early in the morning.
<i>Catha edulis</i>	Catia	<i>celastraceae</i>	Khat	Sh	Cu	Hu	L	Fp	Or	Dry cough	The Juvenile leaves are grinding, boiled, and mixed with sugar and drunken 1 cup for four days.
<i>Plgntago lanceolata</i>	kortebia	<i>plantaginaceae</i>	plantain	H	W	Hu	L	Fp	Der	Skin bleeding, wound and wart	Pounded and painted the sap of leaf on the affected skin.
<i>Echinops macrochaetus</i>	kosoru	<i>Asteraceae</i>	black cumin	Sh	W	Ls	St	Fp	Na	Foot and mouth	Chopped and fumigated to sheep.
<i>Guizotia scabra</i>	Tufa	<i>Asteraceae</i>	niger	H	W	Ls	L	Fp	Der	Tick	The sap of this leaf is rubbed on it (Tick).
								Fp	Der	To dry wound	Pounded and creamed on the wound.

<i>Cynoglossum lanceolatum</i>	Shamata	<i>Boraginaceae</i>	Ceylon hounds tongue	H	W	Hu	L, St	Fp	Or	Stomach ache	Crushed the leaf, homogenized in water and drunk ¼ of cup.
								Fp	Ear	Febrile illness	Squeezed and added to ear drop by drop.
								Na	Evil eye	Fumigated.	
							Or	Diarrhea	Chewed with salt and swallowed.		
						Hu	L			Head ache	Crushed and sniffed.
<i>Gardenia ternifolia</i>	Gamelo	<i>Rubiaceae</i>	Wild gardenia	T	W	Hu, Ls	St	Fp/Dp	Der	Wart	Warm on fire and put on affected area.
<i>Ximenia americana</i>	Kuula	<i>Olacaceae</i>	Hog plum	Sh	W	Ls	L	Fp	Or	Tonsillitis	The young leaf squeezed and dropped into the mouth.
									Or	swelling and teeth	Dried crushed, homogenized in water and give for cattle. Insert the crushed bark in tooth.
								Hu, Ls	B	Fp/Dp	Or
						Hu	S	Dp/Fp	Or	Amoeba	Eat the ripe fruit or seed.

							L	Fp	Na	Common cold	2-3 leaves boiled and fumigated.
<i>Buddleja polystachya</i>	Amfare	<i>Loganiaceae</i>	?	Sh	W	Ls	L	Fp	optical	Eye infection	Squeezed add drop by drop into the eye.
						Hu	B	Fp	Der	Tinea versicolor	Squeezed the sap from bark and creamed on the skin.
<i>Stephania abyssinica</i>	kalalla	<i>Menispetrmaceae</i>	Mudar plant	Cl	W	Hu	R	Fp	Or	Swelling	Pounded, homogenized in water and give oral to drunk.
							L	Fp	Der	Wound	Add on wound by thinning.
<i>Phoenix reclineata</i>	Wola	<i>Arecaceae</i>	phoenix	T	W	Ls	L, St	F	Or	Eye disease	Chewed and add into eye.
<i>Nicotinic tobaccum</i>	Tumbaka	<i>Solanaceae</i>	Tobacco	H	Cu	Ls	L	Fp	Or	To expel leech	Squeezed and add the drop into mouth of cattle.
							Ls, HuL	Dp/Fp	Der, Or	Snake bite (poison)	-Dropped on bitten area. -drink in little amount.

<i>Arundinaria alpine</i>	Elta	<i>Poaceae</i>	Mountain bamboo	Sh	W, Cu	Hu	L	Fp	Ear canal	Ear illness	Pounded and added the liquid drop to the ear for 2-3 days.
<i>Entada abyssinica</i>	Ambelta	<i>Fabaceae</i>	Tree entanda	T	W	Hu	B	Fp	Or	Malaria	The bulb of <i>Allium sativum</i> and the rhizome of <i>Z. officinal</i> pounded along with this bark and taken a spoon once a day for a week.
<i>Euphoria nubica</i>	Anano	<i>Euphorbiaceae</i>	?	Sh	W	Hu	Sap	Fp	Der	Ring worm and Tinea versicolor	The sap is creamed on the skin.
<i>Millerttia ferruginea</i>	Birbersa	<i>Fabaceae</i>	Millttia	T	W	Hu	B	Fp	Dental	Tooth infection	Added the squeezed sap into affected tooth or bitten the bark on the tooth that affected.
<i>Olea europaea</i>	Ejersa	<i>Oleaceae</i>	Olive	T	W	Hu	L	Fp	Or	Male impotency	With the root of Aloe macro carpal and <i>Premna schimperi</i> pounded in water and given with soup to the victim before bed for 2 days.
<i>Acacia abyssinica</i>	dodotia	<i>Fabaceae</i>	Flattop acacia	T	W	Hu	L	Fp	Na	Leishmanesis	The leaf is crushed and sniffed.

<i>Coccinia abyssinica</i>	Anchota	<i>Cucurbitaceae</i>	White bryony	H	Cu	Hu	R	Fp	Or	Tuberculosis	The leaves of <i>Corton macrostachyus</i> is cooked with this plant and eaten with Injera for 3-5 days.
<i>Rumex nepalensis</i>	Temijia	<i>Polygonaceae</i>	Weet flag Or teak	H	W	Hu	L	Fp	Der	Spider poison	The leaves crushed and creamed on affected area.
							R	Fp	Or	Tonsillitis	Crushed the root, homogenized in water and drink 2-3 spoons.
							R, L	Fp	Or, Der	-Healed the cut blood vessels	Pounded the root with salt and ½ spoon is taken for 5 days or added on the wound.
							L, R	Fp	Der	Scabies	Creamed on the skin or wash the skin with it.
<i>Lagenaria abyssinica</i>		<i>Cucurbitaceae</i>		Cl	W	Hu	S	Fp	Der	Ringworm	Paint the fruit or sap on the affected area.
						Ls	S	Dp	Optic	Eye disease (as it go to blind)	Grinding the seed and apply into eye in very small amount.

<i>Solanum gigatum</i>		<i>Solanaceae</i>		Sh	W	Hu	R	Dp	Na, Or	Fibril illness	Fumigated the dried root.
							R	Fp	Or	Rabies	This root is pounded with root of coffee and taken for 3 days (1/2 cup).
<i>Ricinus communis</i>	Keha	<i>Euphorbiaceae</i>	Caste oil	H	Cu	Hu	R	Fp/ Dp	Or	Liver disease	This root is mixed with root of <i>Justical schimperiana</i> . Crushed, homogenized in water and drunken ½-tea cup.
							S	Fp/ Dp	Dental	Tooth infection	Put on fire and apply on affected tooth.
							S			Constipation	Grinding small amount (2-3 seed mixed with honey homogenized in water, and then took 2 spoons.
<i>Allium cepa</i>	Natsa shingrtbira	<i>Alliaceae</i>	-Sweet onion -Bulb onion	H	Cu	Hu	S	Fp /Dp	Or	common cold and cough	Eating 2 bulbs per day.
							Bulb	Dp/Fp	Der	Swelling of leg	Fumigated or creamed on swelling.

									Or	Tonsillitis	Grinding and take 2 spoon with tea.
<i>Berchemia discolor</i>	Duka	<i>Rhamnaceae</i>	Brown ivory	H	W	Hu	L, St	Fp	Or	Snake bite	Pounded and give for an affected one.
<i>Zea mays</i>	Bokola	<i>Poaceae</i>	Maize	H	Cu	Hu	Yebekolo chira	Fp	Or	After delivery smelling of leg.	Decoction one palm of 'bokola chira' and drunk with tella.
<i>Cucurbita pepo</i>	Mata	<i>Cucurbitaceae</i>	pumpkink	H	Cu	Hu	S	Fp	Or	Tape worm	Decoction mixed with salt and eats it.
<i>Millettia ferruginea</i>		<i>Fabaceae</i>	?	T	W	Hu	L	Fp	Der	Worm that attack finger.	Warm the leaf on fire and apply on affected finger.
<i>Echiops kebercho</i>	kabercha	<i>Compositae</i>	?	H	W, Cu	Hu	R	Fp/ Dp	Na, Or	Head ache, Febrile illness and Devil disease.	Eat by chewing or fumigated to patient.
<i>Hagenia abyssinica</i>	Heta	<i>Rosaceae</i>	Africa red Wood	T	W	Hu	L, S	Fp	Or	Tape worm	Dried seed is crushed homogenized in water and drink ½ glasses a day.

<i>Embelia schimperi</i>	Koa	<i>Myrsinaceae</i>	?	Li	W	Hu	S	Dp/ Fp	Or	Tape worm	Dried pounded and drunk ½ -1 glass by mixing in water.
<i>Ruta chalepensis</i>	Chilatama	<i>Rutaceae</i>	Rue-herb	H	Cu	Hu	L	Fp	Or	Common cold	Soaked in tea and drunk.
?	Gabi sheta	<i>Loranthaceae</i>		epi	W	Hu	L	Fp	Der	domestication	Paint on the hand or face and shake the one we want.
<i>Apodyles dimidiata</i>		<i>Aceraceae</i>	White pear	T	W	Ls	B	Fp	Der	Wound healing	Dried, crushed and apply on wound of donkey and horse.
<i>Guizotia abyssinica</i>	Nuwa	<i>Asteraceae</i>	Nug	H	Cu	Ls	S	Dp	Der	Wound healing	Pounded and rubbed on the neck of farming oxen.
<i>Cybnodon dactylon</i>	Tarefa	<i>Poaceae</i>		H	W	Hu	Wh	F	Der	Snake poison	Squeezed and rubbed to affected skin with butter for 5-6 days.
<i>Citrus sinensis</i>	Burtukania	<i>Ritaceae</i>	Orange	Sh	Cu	Hu	B	Fp	Der	Tinea versicolor	Creamed the fruit juice on affected area.

<i>Allium sativum</i>	Shingurt natsa	<i>Alliaceae</i>	Garilc	H	Cu	Hu	L	Fp	Or	Malaria	The Rhizome of <i>Z. officinal</i> , seed of <i>Rassica carinata</i> , salt and <i>Allium sativum</i> grinding and stayed for a few days. Then eat with Injera.
							Sa	Fp	Der	body itching and fungal	Creamed the sap on the affected skin.
							L	Fp	Or	Common cold	2-3 bulbs are eaten for 2 days.
										Tuberculosis	Pounded, mixed with honey and taken 2 spoons for 7 days.
								Fp	Der	Ringworm	The sap is creamed on the affected skin.
								Fp	Or	Lower blood pressure.	Pounded together with <i>Lepidium sativum</i> and eaten with Injera.
								Fp	Or	Stomach ulcer and Diarrhea	Eaten 2-4 bulb with honey early in the morning.

<i>epiphyte of Lipia javanica, Arundinaria alpine and Phoenix reclineata</i>	Sheta: Kusaye, woli and Eleta	<i>Loranthaceae, orchids and canarina</i>	Epiphyte	epi	W	Hu	S, L	Fp/ Dp	-	Give boldness	Tie the epiphytes on the body.
<i>Lipia javanca</i>	Kusaya	<i>Verbenaceae</i>		Sh	W	Hu	Wh	Dp		Insect control in house	Smoking in the house
<i>Zingiber officinale</i>	Zanzibila	<i>Zingiberaceae</i>	Ginger	H	Cu	Hu	Rhizome	Fp	Or	Stomach	Chewing and swallowed it with little salt.
							Rhizome	Fp/ Dp	Or	Common cold	Dried decoction mixed with sugar and drinks it.
										Tonsillitis	Chewed and swallowed.
							Fp/ Dp	Or	Asthma	Pounded and drunk during illness.	
					Lu	Rhizome	Fp	Or	Blackleg	Pounded and given for cattle with salt.	
<i>Azadirachtaindica</i>	Shopmita	<i>Meliaceae</i>	Neem	T	W	Hu	L	Fp	Or		Squeezed and drunk 1 cup a day.

	Etanimita	<i>Loranthaceae</i>		epi	W	Hu	S	Dp	-	To stop rain or to rain	Burn with fire and put dry area like stone to smoke.
<i>-Acacia seyal,</i> <i>Acacia gerrardil,</i> <i>Fragaria species</i> <i>and Echinops macrochaetus</i>	Raka,Dodota ,Gora and Koshosila	<i>Fabaceae</i> <i>Rosaceae</i> <i>Asteraceae</i>	Acacia, strawberry, ?	TT Sh Sh	W	Hu	R	Fp/Dp	Or	Erectile impotency	Crushed these roots together and drunk with soup for 2 days, then it make functional.
<i>Musa xparadisiaca</i>	Muzia	<i>Musaceae</i>	Banana	H	Cu	Hu	Fr	Fp	Or	Intestinal lesion (ulcer).	Eating the fruit as we feel intestinal disorder.
<i>Mangifera indica</i>	Manga	<i>Amncardiaceae</i>	Mango	T	Cu	Hu	Fr	Fp	Or	Anemia	Intake of fruit as problem arises.
<i>Linium ustitatissimum</i>	Keta	<i>Linaceae</i>	Niger seed	H	Cu	Hu	S	Dp	Or	Breast swelling	Pounded, decoction and drunk by mixing with sugar.
							Ls	S	Dp	Or	Placenta retained

<i>Vernonia hymenolepis</i>	Soyama	<i>Asteraceae</i>		Sh	W	Hu	L	Fp	Or	Gonorrhea	With bark of <i>Croton macrostachyus</i> pounded together and mixed with honey. Then 5 spoon is taken morning for 5 days.
							B	Fp	Or	Snake bite	Crushed homogenized in water and drink 1-2 cup

Appendix 4: List of medicinal plant species in home garden of the study area

No-	Plant species	Local name	Family	Habit	Medicinal use for
1	<i>Artemisia rehan</i>	Shawa	<i>Compositae</i>	H	Amoeba
2	<i>Citrus limon</i>	Lommia	<i>Rutaceae</i>	Sh	Stomach ache, Head ache and Fungus
3	<i>Abyssinian cabbage</i>	Toba	<i>Curciferae</i>	H	Expel placenta and Remove constipation
4	<i>Avena sativ</i>	Essa	<i>Poaceae</i>	H	Allergic and Broken bone
5	<i>Lagenaria siceraia</i>	Buqqe adhaa	<i>Cucurbifaceae</i>	Cl	Rabies
6	<i>Juniperus procera</i>	Tsida	<i>Cupressaceae</i>	T	Tonsillitis
7	<i>Trigonella fuenum</i>	Gira	<i>Fabaceae</i>	H	Maintain skin and Constipation
8	<i>Rhammus prinoides</i>	Geshoa	<i>Rhamnaceae</i>	Sh	Tina corporis
9	<i>Carica papaya</i>	Papaya	<i>Caricaceae</i>	H	Intestinal worm and Contraceptive

10	<i>Lepidium sativum</i>	Shinfia	<i>Brassicaceae</i>	H	Ascaris, Stomachache, Commoncold and Malaria
11	<i>Eucalyptus globules</i>	Natsa akaklit	<i>Myrtaceae</i>	T	febrile illness and common cold
12	<i>Coffee Arabica</i>	Bunia	<i>Rubiaceae</i>	Sh	Diarrhea, breast cancer and wound
13	<i>Catha edulis</i>	Catia	<i>Celastraceae</i>	sh	Dry cough
14	<i>Nicotiana tabaccum</i>	Tumbaka	<i>Solanaceae</i>	H	snake poison and expel leech
15	<i>Coccinia abyssinica</i>	Anchota	<i>Cucurbitaceae</i>	H	Tuberculosis
16	<i>Ricinus communis</i>	Keha	<i>Euphorbitaceae</i>	H	Liver disease, tooth infection and constipation
17	<i>Allium cepa</i>	Natsa shengurt bira	<i>Alliaceae</i>	H	Cough, swelling of leg and tonsillitis
18	<i>Zea mays</i>	Bekola	<i>Poaceae</i>	H	Swelling of legs
19	<i>Cucurbita pepo</i>	mata	<i>Cucubrbitaceae</i>	H	Tapeworm

20	<i>Echinops kebercho</i>	Keberchaa	<i>Compositate</i>	H	Fibril illness, Devil disease and Head ache
21	<i>Guizotia abyssinica</i>	Nuwa	<i>Asteraceae</i>	H	Wound healing
22	<i>Citrus sinensis</i>	Burtukana	<i>Rutaceae</i>	Sh	Tinea versicolor
23	<i>Allium sativum</i>	Natsa shengurta	<i>Alliaceae</i>	H	Malaria Itching Common cold Tuberculosis Ring worm asthma
24	<i>Zingiber Officals</i>	Jnjibilaa	<i>Zingiberaceae</i>	H	Asthma and Tonsillitis
25	<i>Musa xparadisiaca</i>	Muuzii	<i>Musaceae</i>	H	Intestinal lesion (ulcer)
26	<i>Mangifera indica</i>	Mangoa	<i>Anacardiaceae</i>	T	Anemia
27	<i>Linum usiatissinum</i>	keta	<i>Linaceae</i>	H	Breast swelling

Appendix 5: List of medicinal plant species collected from wild in the study area

No_	Local name	Scientific name	Family name	Habit
1	Baroha	<i>Croton macrostachyus</i>	<i>Euphorbiaceae</i>	T
2	Banijia	<i>Cordia africana</i>	<i>Boraginaceae</i>	T
3	Araba dubarti	<i>Cardus leptchnthus</i>	<i>Asteraceae</i>	H
4	kakara	<i>Gnidia glaca</i>	<i>Thymelaceae</i>	Li
5	Lolichisaa	<i>Bersama abyssinica</i>	<i>Melanthaceae</i>	T
6	kushia	<i>Urtica urens</i>	<i>Urticaceae</i>	H
7	Awa	<i>Carissa spinarum</i>	<i>Apocyanaceae</i>	Sh
8	Dhumuugaa	<i>Justice schimperiana</i>	<i>Acanthaceae</i>	Sh
9	Galiya	<i>Erythrina Abyssinica</i>	<i>Fabaceae</i>	T
10	Koriya	<i>Grewia ferruginea</i>	<i>Tiliaceae</i>	Cl
11	Muna	<i>Myrsine africana</i>	<i>Rsinaceae.</i>	H
12	Homia	<i>Pruns africana</i>	<i>Rosaceae</i>	T
13	kompa	<i>Aloe species</i>	<i>Aloaceae</i>	H
14	Essa	<i>Ficu sur</i>	<i>Moraceae</i>	T
15	Ezimita	<i>Euphorbia tirucalli</i>	<i>Euphorbiaceae</i>	Sh
16	komonyoa	<i>Brucea antidysenterica</i>	<i>Simaroubaceae</i>	Sh
17	Ezana	<i>Allophyllus maceobortys</i>	<i>Sapindceae</i>	Sh
18	Shedani mata	<i>Zehneria scabra</i>	<i>Cucurbitaceae</i>	H
19	Dakuwa	<i>Zylypium guineense</i>	<i>Myrtaceae</i>	T
20	Ghaa	<i>Vernounia amygalina</i>	<i>Asteraceae</i>	Sh
21	Sholaha	<i>Stereospermum kunthiamum</i>	<i>Bignoniaceae</i>	T
22	Hidda feefiia	<i>Clematis simensis</i>	<i>Ranunculaceae</i>	Cl
23	Dhoqounuu	<i>Grewia ferruginea</i>	<i>Tiliaceae</i>	Sh
24	Mukha arbaa	<i>Alizia Gumifera</i>	<i>Fabaceae</i>	T
25	Hadhessa	<i>Teclea nobilis</i>	<i>Rutaceae</i>	T

26	Asanngrria	<i>Datura stramonium</i>	<i>Solanaceae</i>	H
27	Endod	<i>Phytolacca dodencandr</i>	<i>Phytolacaeae</i>	Sh
28	Gulia	<i>Rumex nervosus</i>	<i>Polygonaceae.</i>	H
29	Sheti gulia	<i>Dracaena steudneri</i>	<i>Araliceae</i>	T
30	Bifti.	<i>Warburgia uandensis</i>	<i>Canellaceae</i>	T
31	Abayia	<i>Maesa lanceolata</i>	<i>Myrsinaceae</i>	Sh
32	Qorxobbiiia	<i>Plantago lanceolata</i>	<i>Plantaginaceae</i>	H
33	Kossorraa	<i>Echinops macrochaetus</i>	<i>Asteraceae</i>	H
34	Tuufaa	<i>Guizotia scabra</i>	<i>Asteraceae</i>	H
35	shamata	<i>Cynoglossum lanceolatum</i>	<i>Malvaceae</i>	H
36	Gambeloa	<i>Gardenia ternifolia</i>	<i>Rubiaceae</i>	T
37	Kuula	<i>Ximenia amerioana</i>	<i>Olaceae</i>	Sh
38	Amaree	<i>Buddleja polystachya</i>	<i>Logajaceae</i>	Sh
39	Hidda kalaala	<i>Stephania abyssinica</i>	<i>Memispermaneeae</i>	Cl
40	Wola	<i>Phoenix reclinata</i>	<i>Arecaceae</i>	T
41	Eltaa	<i>Arundinaria alpine</i>	<i>Poaceae</i>	Sh
42	Ambalta	<i>Entadad abyssinica</i>	<i>Fabaceae</i>	T
43	Annoo	<i>Euphorbia nubica</i>	<i>Euphorbiaceae</i>	Sh
44	Berberrsa	<i>Millettia fernuginea</i>	<i>Oleaceae</i>	T
45	Ejersa	<i>Olea europaea</i>	<i>Oleaceae</i>	T
46	Dodotia	<i>Acacia abyssinica</i>	<i>Fabaceae</i>	T
47	Timijjia	<i>Rumex nepalesis</i>	<i>Polygonaceae</i>	H
48	Hiddi sareya	<i>Solanum gigantum</i>	<i>Solanaceae</i>	Sh
49	Embayoo	<i>Lagearia abyssinica</i>	<i>Cucurbitaceae</i>	Cl
50	Duka	<i>Berchemia discolor</i>	<i>Rhamrinaceae</i>	H
51	Sotalloa	<i>Millettia ferruginea</i>	<i>Fabaceae</i>	T
52	Heta	<i>Hagenia abyssinica</i>	<i>Rosaceae</i>	T
53	koha	<i>Embelia schimperi</i>	<i>Myrsinaceae</i>	Li
54	Herttoo	?	<i>Loranthaceae</i>	Epi

	Gambelo			
55	Tarefa	<i>Cynodon dactylon</i>	<i>Poaceae</i>	H
56	Herto Mexxi,sheta	?		Epi
57	Kusyea sheta	<i>Lipia javanica</i>	<i>Verbenaceae</i>	Sh
58	Shopa mita	<i>Azadirachta india</i>	<i>Meliaceae</i>	T
59	Raka,Dodeta	<i>Acacia seyal</i>	<i>Fabaceae</i>	T
60	Sooyama	<i>Vernonia hymenolepis</i>	<i>Asteraceae</i>	sh