WOLKITE UNIVERSITY

COLLEGE OFAGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF WILD LIFE AND ECOTOURISM MANAGEMENT

SENIOR RESEARCH PROJECT

ETHNOBOTONICAL STUDY OF MEDICINAL PLANTS IN DINSHO WOREDA BALE ETHIOPIA

BY: FURNO BADASA

ID NO: AGR/137/09

ADVISOR: ABEL FEYISA

SENIOR RESEARCH PROJECT SUBMITTED TO DEPARTMENT OF WILD LIFE AND ECOTOURISM MANAGEMENT, COLLEGE OF AGRICULTURE AND NATURAL RESOURCE, WOLKITE UNIVERSITY FOR THE PARTIAL FULFILLMENT OF THE COMPLETION OF BSC DEGREE IN WILD LIFE AND ECOTOURISM MANAGEMENT

WOLKITE, ETHIOPIA

June 2019

DECLARATION

I hereby declare that this senior research project entitled "Ethnobotonical Study of Medicinal Plants In Dinsho Woreda Bale Ethiopia". Submitted to the department of Wild Life and Ecotourism Management; Wolkite university, college of agriculture and natural resources in partial fulfillment of the requirements for the BSc degree in Wildlife and Ecotourism management, is a recorded of original work done by me and the supervision of Mr.Abel Feyisa.

Name_____

Place_____

Date of submission_____Signature_____

ACKNOWLEDGEMENT

First of all I would like to thanks God, since everything depends on his support. Then my Special appreciation and deepest thanks goes to my advisor, Abel F. for his good suggestion and constrictive ideas in preparing the paper. Lastly I would like to thank Wolkite university college of agriculture and natural resource department of wild life and ecotourism managementfor providing such opportunities.

Acronyms

IK-Indigenous Knowledge

IP- Indigenous People

WHO- World Health Organization

Spps- Species

Table of Contents

DECLARATION i

ACKNOWLEDGEMENT II

ACRONYMS III

LIST OF TABLE VI

ABSTRACT VII

1. INTRODUCTION 1

1.1. Background of the study 1

1.2. Statement of the problem 2

1.3. Significance of the study 2

1.4. Objectives 3

1.4.1. General objective 3

1.4.2. Specificobjectives 3

1.5. Research question 3

1.6. Limitations of the study 3

2. LITERATURE REVIEW 4

2.1. Plant and people interaction 4

2.2. Indigenous knowledge (IK) and medicinal plants 5

2.3. Role of medicinal plants 6

2.4. The use of traditional medicinal plant in Ethiopia 6

3. METHODOLOGIES 7

3.1. Description of the study area 7

3.2. Indigenous knowledge of local community in the study area 7

3.3. Local topographic classification of land 8

3.4. Methods of study 8

3.4.1. Sampling techniques and sample size 8

3.4.2. Selection of study site 8

3.4.3. Informants Sampling 8

3.4.4. Key informants 9

3.4.5. Sources and methods of data collection 9

3.4.5.3. Ethnobotanical data collection and techniques 9

3.4.5.4. **Method of Data Analysis** 9

4. RESULTS AND DISCUSSION 11

4.1. **Demographic Information based on sex, education level, marital status and range distributions** 11

4.1.1. Demographic interpretation based on sex 11

4.1.2. Interpretation based on educational Background of the respondents 12

4.1.3. Interpretation based on maritalstatus 12

4.1.4. Interpretation based on Age Range distribution 12

4.2. Discussion 12

4.2.1. Medicinal plant resources of the study area 12

4.2.2. Distribution of medicinal plants in the study area 15

4.2.3. Medicinal plants used to treat both human and livestock ailments 15

4.3. Major human diseases and plant species used 16

4.4. Major livestock diseases and plant species used 19

4.5. Sources of medicinal plants for human, livestock and both human and livestock ailment treatment 20

4.6. Habits of human, livestock and both human and livestock medicinal plants 20

4.7. Parts of medicinal plant use 20

4.8. Application of medicinal plants 21

4.9. Traditional knowledge transfer to the young 21
4.9.1. Threats to medicinal plants 22
4.9.2. Conservation of medicinal plants 22

5. CONCLUSION AND RECOMANDATION 23

5.1. Conclusion 23

5.2. RECOMMENDATIONS 24

REFERENCES 25

APPENDIXES 26

List of Tables

Table 1 Demographic characteristics of respondents distribution, source: Personal survey, 2019 11

Table 2 Distribution of sampled species in different families. 13
Table 3 Families of medicinal plant species used to treat both human and livestock, source: Field observation, 2019 15
Table 4 Human diseases and number of plant species used 17
Table 5 Livestock diseases and number of plant species used 19
Table 6 Parts of medicinal plant species used by indigenous people 21
Table 7 Sources of knowledge on practicing of traditional medicine in the study area: Sources, Field observation,2019 21

ABSTRACT

Medicinal plants which are used by indigenous people was very important to combat or to prevent different ailments or diseases and human sufferings.It was the only system available for healthcare prior to the introduction of modern medicine for prevention, diagnosis and treatment

of social, mental and physical illness in both human and livestock on their existence of life. Due to accessibility, acceptability and biomedical benefits there is a large magnitude of use and interest of medicinal plants in Dinsho woreda. Then the study entitled by the "Ethnobonical study of medicinal plant was carried out from May to June in Dinsho woreda. The main objective of this study is to assess and document medicinal plant species used by the indigenous people and threats affecting them in the study area.

Information was gathered from 91 people (63 males and 28 females). The informants, except the healers, were selected by using purposive sampling method and 26 key informants were selected randomly and no appointment was made prior to the visits. Ethnobotanical data were collected using semi-structured interviews with informants, field observations, guided field walk, Group discussion, with traditional medicine practitioners. The ethnomedicinal use of 85 plant species was documented in the study area used as cure for 61 ailments. They are distributed across 79 genera and 44 families. Of these, 54 medicinal plants were reported for human ailments treatment, eight for livestock and 23 for both human and livestock ailment treatment.. Informant consensus analysis showed that ailments like rabies, poisoning, snake bite, evil spirit and evil eye, wound, body swelling, intestinal parasite and pneumonia and jaundice were major diseases in the study area respectively. The principal threatening factors for medicinal plants reported were agricultural expansion and fire.

Key words: *Medicinal plants, Ethnomedicinal plants, Indigenous people, Indigenous knowledge, Medicinal plants, Species.*

1. INTRODUCTION

1.1. Background of the study

The Ethiopia flora is estimated to contain between 6500 and 7000 species of higher plant, of which about 12%are endemic (TewoldeEgziabher, 1991).The country is well known for its significant geographical diversity which favoured the formation of different habitat vegetation zones. Ethiopia is also home of many languages, cultures and belief which have in turn contributed to the high diversity of traditional knowledge and practices of the people which among others includes the use of medicinal plant. Plants have been used as a source of medicine in Ethiopia from time immemorial to treat different ailments. Due to its long history; traditional medicine has infect become an integral part of culture (Pankhurst, 1965). Also natural forest is both an ecosystem and a resource: as an ecosystem it integrates diverse fauna, flora and the physical environment; as a resource it has various economic, ecological and social values. It involves multiple and interrelated factors of people-forest interaction and results in significant environmental and social consequences. People-forest interaction is determined by the interaction in space and over time of biophysical and human factors. A study of such interaction needs to conceptualize the relationship between the driving forces of human induced changes, the processes and activities among them, and human behaviour and organization (Guoren, 1998).

Herbal medicine treatment is believed to have been started by early humans. When people started to select their food from plants growing nearby, they must have kept some of those, which they found to cure some of their ailments, or which they thought would cure diseases. Thus, the use must have arisen out of need. Throughout the centuries, some of these plants have been used successfully to treat diseases and later on they constituted the basis for many of the modern day drugs like quinine, digitalis, etc. (Jansen, 1981). Written records in this field are almost absent even though the country has had a written language for over 2000 years. Written records are found mainly from three categories. The first, the “debterras”, those persons who compile books of medicinal recipes mainly herbals called “EtseDebdabe” which consists of information on plants with medicinal values and name of diseases (TeferiGedif and Jurgen, 2003). A debtarra is a person who has church education, can read and write text in Amharic and geez. Often their writings on herbal medicine are composed of medicine and magic or superstition. Also it is rarely that one comes across the names of debterras on Etse debdabes (TeferiGedif and Jurgen, 2003). The second category of people involved in compiling information and to some extent also carrying out some studies in traditional medical practices includes primarily French, British and Italian travellers, naturalists, pharmacognosists and plant collectors who visited Ethiopia between about 1830 and 1930. In the third category are found ecologists, taxonomists, ethnobotanist, chemists and pharmacognosists, who work within government ministers, research institutions and educational establishments both within and outside of Ethiopia (AberaGeyid*et al*., 2005). The knowledge is passed by word of month from one generation to the next by priest, with doctor or medicine men (DesalegnDesissa, 2000).

Some of the lore is lost at each point of transfer modified and thus became erroneous and dangerous to use. With doctors to safe guard their interest win the respect of the mass, usually compose a long and impressive list of curative herbs for a particular disease, when they know that is one of the listed that cause a cure (AberaGeyid*et al*., 2005).. This is also done to discourage others from becoming herbal doctors if they are forced to tell the secrets. For the same reasons the plants comprising the remedy are selected from different ecological locations such as alpine, highlands or lowlands, thus rendering it more difficult to exactly duplicate the ingredient. These with doctors says that the healing power of the plant loses its curative healing values if not kept secret, the informant is also thought to be subjected to misfortune and bad luck (AberaGeyid*et al*., 2005). As a result the doctors pass the knowledge only to their first born-sons when they are about to die. If the first son is not found worthy of trust, another member is considered, after having given his solemn oath not to reveal the secrets he is taken to all the places where the plants are known to grow, or he is given verbal directions on the description of the plants and their localities. It is always men who take up the art, though many women pass the knowledge especially those dealing with childbirths (Kokwaro, 1976). Ethiopia is characterized by a wide range of ecological, edaphic and climate conditions that account for the wide diversity of its biological resources both in terms of flora and fauna wealth.

Medicinal plants are distributed all over the country with great concentration in the south and south-eastern parts of the country. The wood lands of Ethiopia are the source of most medicinal plants, followed by montane grassland or dry montane forest complex of the plateau; others include the evergreen bush land and rocky (GirmaDefar, 1998). This study therefore focused on the local knowledge of medicinal plants including their uses and management.

1.2. Statement of the problem

Like in other parts of Ethiopia, there are number of medicinal plant spp which is used traditionally by indigenous people in Dinsho Woreda. But there is not well management activities and documentation to transfer from one generation to the next generation due to lack of depth knowledge about medicinal plants in the local people and they are affected with different factors .This factors are both natural and anthropologic. Despite these medicinal plant species are found in this site there is no any adequate document or research paper that concerned with medicinal plants and different causes that drives them to vulnerability and extinction. Therefore the present study reveals that assessing and documenting the important medicinal plants Species in study area and conservation of them from various factors to transfer next generation and sustainable utilization.

1.3. Significance of the study

Some of the basic significance of this paper was helps to list and preserve the medicinal plant Spps used by indigenous people (IP), create awareness for traditional medicinal practitioners to

pass through the medicinal plants for next generation, encourage other researcher to conduct a research on the related issue and the find use as a base line or reference for other researcher.

1.4. Objectives

1.4.1. General objective

The general objective of this study is to assess and document medicinal plant species used by the indigenous people of the study area.

1.4.2. Specificobjectives

- To identify important medicinal plants and their parts used in the treatment of health problems for both humans and livestock.
- To assess the role of traditional practices and indigenous knowledge in maintaining medicinally important plant species in study area
- To assess implications on the current status and threat on medicinal plants in the area

1.5. Research question

The research will be tried to answer the following question;-

1. What are the medicinally useful plant species used by indigenous people (IP) for the treatment of both human and livestock?
2. What types of diseases treated by these plant species?
3. How do the local people obtain and use these plant species to treat various diseases?

1.6. Limitations of the study

The naturity of landscapes and accessibility of area might influence the overall outcome of the study. There are no relevant documents about the medicinal plants library and the unwillingness of the sectors to give some of the segments of the information also creates hindrance on the study. The limitation of time allotted to the research project was alsolimit the researcher from using other research techniques like observation in addition to theindividual interviews and focus group discussions. Shortage of relevant materials relatedto the theme might have impacts on the study to some extent.

2. LITERATURE REVIEW

2.1. Plant and people interaction

Traditional people around the world possess unique knowledge of plant resources on which they depend for food, medicine and general utility including tremendous botanical expertise (Martin, 1995). This implies that humans are dependent on other organisms for their life. Although various animal and mineral products contribute to human welfare, the plant kingdom is most essential to human well-being especially in supplying his basic needs. The indispensable dependency of humans up on plants for their livelihoods was primarily started by domestication and dates back to 10,000 years (Martin, 1995).

Over centuries, indigenous people have developed their own locality specific knowledge on plant use, management and conservation (Cotton, 1996). Plants have been used as a source of traditional medicine in Ethiopia from time immemorial to combat different ailments and human sufferings (ZemedeAsfaw*et al*., 1999). Due to its long period of practice and existence, traditional medicine has become an integral part of the culture of Ethiopian people (MirgissaKaba, 1998).

There is a large magnitude of use and interest in medicinal plants in Ethiopia due to acceptability, accessibility and biomedical benefits (DawitAbebe, 2001). The continued dependency on herbal medicine along with the side of modern medicine is largely conditioned by economic and cultural factors (Aketch, 1992). In addition to these factors, the fact that modern medical services are inaccessible to the vast majority of the populations due to their costs made herbal medicines more acceptable. Hence, in present-day Africa including Ethiopia, the majority of people lack access to health care and where available the quality is largely below standard (Abbiw, 1996). Indigenous peoples and the local communities' reliance on plant resources account for anything up to 95% of their survival requirements (Archer, 1990). Therefore, herbal remedies are the world's therapeutic means to act against diseases for a large proportion of people of both rural and urban areas in developing countries like Ethiopia (Abbiw, 1996). Ethiopians have used traditional medicines for many centuries, the use of which has become an integral part of the different cultures in modern Ethiopia. The indigenous peoples of different localities in the country have developed their own specific knowledge of plant resource uses, management and conservation (Pankhurst, 1965). Traditional remedies are sometimes the only source of therapeutics for nearly 80% of human population and 90% of livestock in Ethiopia of which 95% are plant origin. The majority of the population that lives in the rural and the poor people in urban areas rely mainly on traditional medicines to meet their primary health care needs (DawitAbebe, 1986). In most scenarios, the traditional knowledge in Ethiopia is passed verbally from generation to generation and valuable information can be lost whenever a traditional medical practitioner passes without

conveying his traditional medicinal plant knowledge. In addition, the loss of valuable medicinal plants due to population pressure, agricultural expansion and deforestation is widely reported by different workers (DawitAbebe, 2001). As a result, the need to perform ethnobotanical researches and to document the medicinal plants and the associated indigenous knowledge must be an urgent task. The studies conducted on the traditional medicinal plants in Ethiopia are limited when compared with the multi-ethnic cultural diversity and the diverse flora of Ethiopia. Thus, this study was initiated to document the medicinal plants in the natural vegetation in Dinsho Woreda, which assume that the data could be used as a basis for further studies on medicinal plants in Dinsho Woreda and for future phytochemical and pharmacological studies.

2.2. Indigenous knowledge (IK) and medicinal plants

Indigenous knowledge (IK) refers to the accumulation of knowledge, rule, standards, skills, and mental set, which are possessed by local people in a particular area (Quanah, 1998). It is the result of many generations' long years' experiences, careful observations and trial and error experiments (Martin, 1995). Traditional people around the world possess unique knowledge of plants resources on which they depend for food, medicine and general utility including tremendous botanical expertise (Martin, 1995). Over centuries, indigenous people of different localities have developed their own specific knowledge on plant resource use, management and conservation (Cotton, 1996).

Systematic application of IK is important for sustainable use of resources and development (Thomas, 1995). Various animal and mineral products contribute to human welfare; the plant kingdom is most essential to human wellbeing especially in supplying basic human needs. Since ancient times, human beings used plants for the purpose of disease control and prevention. It was believed to be the result of many generations long years' experience, careful observations and trial and error experiments that early humans acquired the knowledge on the utilization of plants for disease prevention and curative purposes (Sofowora, 1982; Martin; 1995). So, the knowledge and application of traditional medicine is one of the widely used indigenous knowledge systems. This implies that humans are dependent on other organisms for their life. This close interaction and dependency of human on plants is studied under the field of Ethnobotany. Such knowledge, known as ethnomedicinal knowledge involves traditional diagnosis, collection of raw materials, preparation of remedies and its prescription to the patients. Indigenous knowledge on remedies in many countries including Ethiopia passes from one generation to the next verbally with great secrecy. Such secrete makes indigenous knowledge vulnerable to distortion and in most cases; some of the lore is lost at each point of transfer; there is a need for systematic documentation of such useful knowledge through ethnobotanical research.

2.3. Role of medicinal plants

Plants have played crucial role as a source of traditional medicine in Ethiopia from the time immemorial to combat different ailments inhuman sufferings (AsfawDebela*et al*., 1999). It was the only system available for healthcare prior to the introduction of modern medicine for prevention, diagnosis and treatment of social, mental and physical illness (Dawit Abate, 1986). To date traditional medicine has become an integral part of the culture of the Ethiopians people due to its long period of practice and existence (MirgissaKaba, 1998). The antiquity of the traditional use of medicinal plants in Ethiopia could never be disregarded (Pankhurst, 1990 and MirutseGiday, 1999). Due to accessibility, acceptability and biomedical benefits there is a large magnitude of use and interest of medicinal plants in Ethiopia (, 2001).

2.4. The use of traditional medicinal plant in Ethiopia

2.4.1. Medicinal plants in human healthcare system

As in any African countries, the use of plants in religious ceremonies as well as for magic and medicinal purposes is common in Ethiopia. This knowledge of traditional medicine has been passed on by word of mouth from one generation to the next by herbalists and knowledgeable elders. About 80% of the Ethiopian population depends on traditional medicine for their health care practices. However, as time goes on, the traditional knowledge is gradually worn away for reasons mainly attributed to environmental degradation and deforestation, which in turn brought about the loss of some species including medicinal plants **(**DesalegnDesissa, 2000**)**. Plant diversity remains crucial for human well-being and still provides a significant number of remedies required in healthcare. Medicinal plants played a pivotal role in the treatment of various afflictions in Ethiopia (Fekadu Fullas, 2007). For the role-played by plant derived products in human and livestock health, systematic scientific investigations are vital (WHO, 1998). Plants play a major role in providing prototype molecules for possible development into conventional drugs by the pharmaceutical industry (Fekadu Fullas, 2007). However, only small fractions of the world's plants have been investigated scientifically so far, but, human kind has already reaped enormous benefits from it (Farnsworth *et al.,* 1985)

3. METHODOLOGIES

3.1. Description of the study area

Dinsho Woreda, is found in Bale Zone OromiaRegional State, located on the south-eastern escarpment of south- central Ethiopia, that extend between 7 05' N and 39 45' E/ 7.083N ,39.750E and an elevation of 3207 meters, about 402 km southeast of the capital city, Addis Ababa and about 27 km north of Robe Town . The topography of the Woreda has mountains and hills are covered 53.5%, flat areas 26.25% and undulating parts coverer 20.25% of the Woreda(Dinsho Agricultural and Rural Development Office Report, 2008).

The Woreda is bordered with Agarfa North, SinanaWoreda in the East, and Adaba in the South and currently the Woreda comprises of 6 kebeles. The 2007 national census reported a total population for this Woreda of 39,124, of whom 19,252 were men and 19,872 were women; 2,966 or 7.58% of its population were urban dwellers. The majority of the inhabitants said they were Muslim, with 85.98% of the population reporting they observed this belief, while 13.65% of the population practiced Ethiopian Orthodox Christianity (2007, population and housing census of Ethiopia result for Oromia Region vol.1)

Based on the data collected from 1998-2009 by the National Meteorological Service Agency (NMSA) the range of mean monthly minimum and maximum temperature of the study area are 10.2 C and 20.1 C in the month of November and January respectively. The hottest month is January with a maximum temperature of 20.1 ^{O}C and the coldest month is November with a minimum temperature of 10.2 C.Theagro- ecology of the Woreda has 23% humid and 73% sub-humid tropical climate and receives a mean annual rainfall of 1,163 mm per year and show bimodal type of rainy season (2008, Dinsho Agricultural and Rural Development Office Report). Short rain season is between Marchs and May accounting for 28% (Belg or spring) of total rainfall, and long rain season between July and October accounting for more than 50% of the total rainfall (NMSA)

The remnant forest vegetation at Dinsho Woreda can be categorized as 'Dry evergreen Afromontane' forests. A variety of fruit trees and shrubs and cash tree crops (*e.g. Mangiferaindicia*, *Coffeaarabica*,Persea*Americana*, *Prunuspersica*, *Rhamnusprinoides*, *Catha edulis, etc.*) dominated by Junipers procera, *Hageina abyssinica* and hpericamspps.The dominant species in the parklands include *Cordia africana*, *Albizia gummifera*, *Croton macrostachyus*, *Ficus*species, and *Millettia ferruginea*. Maize (*Zea mays)*.The Wheat is the major grain crop grown on farms. There is various root crops and vegetables. The major crops include Wheat, BarleyandTelba, chat, maize and potatoes

3.2. Indigenous knowledge of local community in the study area

The local people of the study area, specially elders and knowledgeable community members have their own knowledge about their environment and surroundings. They are

knowledgeable on how to classify the soils, vegetation, land and topographical arrangement of their environment traditionally.

3.3. Local topographic classification of land

The local people of the study area classify their land based on their perception of land topographic arrangement and benefits they get from the land.

I-Lafa diriiraa: Land form which has plain land suitable for settlement, agriculture and livestock grazing.

II-Gooroo: Land form which has very low elevations suitable for agriculture and after harvesting a product available for grazing.

III-Tulluu: Land forms which has some elevations than the first one and suitable for agriculture and grazing.

VI-Gaara: Land form which has high elevations or mountains the advantages is for grazing and fire wood collection.

V-Suluula; Land forms which has found in between elevated land form (Valley).

3.4. Methods of study

3.4.1. Sampling techniques and sample size

3.4.2. Selection of study site

The study was carried out in Dinsho Woreda have six kebeles. From six kebeles (Gojara, Horasobba, Geremba-Dima, Karare Dinsho 01, and Dinsho 02), Gojara and Dinsho 01 kebeles were selected for its forest potential and that have the variety of medicinal plantSpps which used by indigenous people.

3.4.3. Informants Sampling

A total of 91sample respondents (63 males and 28 females) wasselectedfrom the total population of 996 household of the two kebele (464 fromGojara and 532 from Dinsho 01) by using purposive sampling strategy. The sample size was determined by using the formula of (Yamane, 1967),) to determine the required sample size at 90% confidence level and level of acceptance= 10% (0.1); $n = \frac{N}{1 + N(e)^2}$

Where as
N=Total households of the study area
n=the desired sample size
e=acceptance level of error (10%)

1=Constant
Therefore, the sample size will be determined from this equation,

$$\mathbf{n}=\frac{996}{1+996(0.1)2}=\frac{996}{10.96}=\mathbf{91}$$

3.4.4. Key informants

The 26 key informants was selected randomly based on recommendations from local communities (kebele administrators and local guides). Keyinformants was selected randomly and no appointment would be made prior to the visits. They was asked to give their knowledge about the plants they use against a disease and plant parts harvested.

3.4.5. Sources and methods of data collection

To undertake this research the data was collected from both primary and secondary source of data collection methods.

3.4.5.1. Primary source of data

The primary data was collected through interview, questionnaires and personal observations.

3.4.5.2. Secondary source of data

The secondary data would be obtained from various sources, such as official documents, books, web sites and other related literatures.

3.4.5.3. Ethnobotanical data collection and techniques

The techniques employed for data collection was group discussion, field observations, guided field walk and semi-structured interview with informants in Afaan Oromo language focusing on indigenous knowledge of the local community on local classification, use, conservation, health and threats of medicinal plants. At the end of the interview, the reported medicinal plants were collected from natural vegetation and home garden and as well as farm lands. Sample specimens of the plants cited for their medicinal use were collected, numbered, pressed and dried for identification. -

3.4.5.4. Method of Data Analysis

To achieve objective of the study, the data that collect from the representative of the given respondent was analyze and discuss in detail by using qualitative and quantitative data analysis method. Qualitative data analyzed through descriptive methods and quantitative data analyzes through percentage, frequency and tabulation.

3.4.5.5. Descriptive statistics

Descriptive statistical methods such as tables and percentages were employed to analyse and summarize the ethno botanical data on the reported medicinal plants, use and associated knowledge. The most useful information gathered on medicinal plants reported by local people: medicinal value, application, disease treated, parts used and habit was analysed through descriptive statistics. In order to evaluate the reliability of information during the interview, informants were contacted two times for the same ideas to check the validity of the information recorded.

4. RESULTS AND DISCUSSION

4.1. **Demographic Information based on sex, education level, marital status and range distributions**.

Table 1 Demographic characteristics of respondents distribution, source: Personal survey, 2019

Sex	No_ of respondents	Percentage (%)
Male	63	69.2%
Female	28	30.8%
Total	91	100%
Level of education	Respondents	Frequency (%)
Illiterate	19	20.8
Can read and write	28	30.8
Elementary	18	19.8
High school	22	24.2
University	4	4.4
Total	91	100%
Marital status	Respondents	Frequency
Unmarried	36	39.5%
Married	50	55%
Windowed	2	2.2%
Divorced	3	3.3%
Age distribution	Range of respondents	Frequency (%)
20-30	29	31.8
30-40	30	33
40-50	19	20.8
50-60	9	9.9
>_70	4	4.5

4.1.1. Demographic interpretation based on sex

Based on the information obtained on household representative responses of questionnaires, female respondents were 30.8% and the remaining 69.2% were male. Thus, the sex distribution showed that household representatives were composed in a ratio where males exceed a bit more

than females. This result was in line with the general information of Dinsho Woreda household representatives to assess the medicinal plant species used by indigenous people in study area (administration system, culture, access and interest).

4.1.2. Interpretation based on educational Background of the respondents

Many of the respondents' (20.8%) are illiterate followed by 30.8% can read and write, elementary with 19.8%, 24.2% high school and 4.4% University degree holders. As a result, most of the respondents (48.4%) had basic education in elementary, and high school and University which enabled them to be involved on use of medicinal plants in their surroundings. Basically, they are good at English language which is satisfactory for their communication in local guiding, management, conservation planning, decision-making and use of medicinal plants within Dinsho Woreda supported via training to fill special knowledge, attitude and gaps to cope up with the information ages.

4.1.3. Interpretation based on maritalstatus

Regarding the marital status of respondents, 55% were married followed by 39.5% unmarried/single, 3.3% divorced, 221% widowed. This result went in line with the respondents were supposed to be household leaders or members related to marriage though it is not always the case true.

4.1.4. Interpretation based on Age Range distribution

Majority of the respondents' (31.8%%) were found to be in the age range of 20-30 years old followed by 33% age range of 30-40 years old, 20.8% age range of 40-50 years old, 4.5% of 70 years old and above where as the remaining 9.9% of respondents were between 50-60 years old. Accordingly, the result indicated that the productive human resource or adult age group of Dinsho Woreda dominated the age range between 20-50 or 85.6%. This age range is very important for the of the study area. Because of the deep knowledge and skills to separate medicinal plant *Spps*and their potential to conserve them.

4.2.Discussion

4.2.1. Medicinal plant resources of the study area

Eighty five plant species distributed into 79 genera and 44 families were documented as having medicinal value in the study area (Table 2). About 70 of the medicinal plants were collected from the wild and 15 from homegardens. The leading family was *Fabaceae* with seven species, followed by *Lamiaceae* with six species, Asteraceae, Cucurbitaceae, Euphorbiaceae and Solanaceae each with five species and the others are listed in (Table 2). The family Fabaceae contributes higher number of plant species than others in the study area used for medicine. This work is agree with the work of Haile Yineger and Dilnessaw Yewhalaw (2007), Endale Amenu (2007), Ermias Lulekal *et al*. (2008) and Tesfaye Hailemariam *et al*. (2009) on their ethnobotanical investigations they found that family Fabaceae contribute highest number of plant species.

Table 2 Distribution of sampled species in different families.

Family	Number of species	%
Fabaceae	7	7.7
Lamiaceae	6	6.6
Asteraceae	5	5.5
Cucurbitaceae	5	5.5
Euphorbiaceae	5	5.5
Solanaceae	5	5.5
Rutaceae	4	4.39
Boraginaceae	3	3.3
Acanthaceae	2	2.2
Flacourtaceae	2	2.2
Malvaceae	2	2..2
Melianthaceae	2	2.2
Moraceae	2	2.2
Polygonaceae	2	2.2
Ranunculaceae	2	2.2
Rosaceae	2	2.2
Rubiaceae	2	2.2
Alliaceae	1	1.09
Alloaceae	1	1.09
Amaranthaceae	1	1.09
Anacardiaceae	1	1.09
Apocynaceae	1	1.09
Caricaceae	1	1.09

Celastraceae	1	1.09
Cuppresaceae	1	1.09

Table 2 continued

Commelinaceae	1	1.09
Crassulaceae	1	1.09
Loganiaceae	1	1.09
Menispermaceae	1	1.09
Oleaceae	1	1.09
Orobanchaceae	1	1.09
Papaveraceae	1	1.09
Pittosporaceae	1	1.09
Podocarpaceae	1	1.09
Poaceae	1	1.09
Phytolaccaceae	1	1.09
Rhamnaceae	1	1.09
Morignaceae	1	1.09
Meliaceae	1	1.09
Myrsinaceae	1	1.09
Myrtaceae	1	1.09
Sapindaceae	1	1.09
Urticaceae	1	1.09
Zingiberaceae	1	1.09

source: Field observation, 2019

Regarding with the habit diversity 22 plant species (24.17%) were trees, 32 (35.16%) were shrubs, 24 (26.37%) were herbs, seven (7.71%) were climbers. Shrubs were the most harvested forms as source of medicines. They were relatively common in the study area

compared to medicinal herb, tree and climber species. This could be associated with the abundance and year round availability of shrub species in the area. This shows that shrubs were the most harvested forms for medicinal purpose followed by herbs, trees and climbers. This finding agrees with the findings of Fisseha Mesfin *et al.* (2009).

4.2.2. Distribution of medicinal plants in the study area

Most of the plants were collected from natural vegetation. The tree species were found mainly in the forests and fences; shrubs from woodlands, rocky surfaces and secondary forests; herbs were mostly found in forest and on the river side and climbers from home gardens and forest. Medicinal plants like *Allium sativum*, *Artemisia abyssinica*, *Nicotiana tabacum*, *Ocimum lamiifolium*, *Zingiber officinale, Momordica boivinii, Momordica foetida, Cucurbita pepo, Catha edulis, Ruta chalepensis*, *Citrus sinensis, Citrus Lemon, Rhamnus prinoides, Coffea Arabica,* and *Carica papaya* were restricted to farmlands and homegardens.

4.2.3. Medicinal plants used to treat both human and livestock ailments

The medicinal plants used to treat both human and livestock ailments were collected and recorded from the study area. A total of 23 plant species which belongs to 23 genera and 17 families were collected and recorded (table 3). Family lamiaceae contributes three species followed by euphorbiaceous, fabaceae, ranunculaceae and solanaceae contribute two species each and the rest of the 12 families contribute one species each. 19 plant species were gathered from the wild and 4 plant species from home gardens. This is in agreement with the work of Endale Amenu (2007), in which wild sources of medicinal plants were used for the treatment both human and livestock ailments than home gardens. Those medicinal plants also used as remedies in other parts of Ethiopia. Of this six species are mentioned in Tilahun teklehaymanot and MirutseGiday (2007), four species in Ensermu Kelbessa *et al.* (2008) and eight species in Tesfaye Awas and Sebsebe Demissew (2009). Table 3: Families of medicinal plant species used to treat both human and livestock ailments with the number of species.

Table 3 Families of medicinal plant species used to treat both human and livestock, source: Field observation, 2019

Family	**Number of species**
Lamiaceae	3
Euphorbiaceae	2
Fabaceae	2

Ranunculaceae	2
Solanaceae	2
Alliaceae	1
Asteraceae	1
Cucurbitaceae	1
Cuppresaceae	1
Melianthaceae	1
Myrsinaceae	1
Phytolaccaceae	1
Rosaceae	1
Rubiaceae	1
Rutaceae	1
Urticaceae	1
Zingiberaceae	1

4.3. Major human diseases and plant species used

In this study, more than 40 different human ailments were recorded that were reported by informants as human health problems. The major and most widespread diseases according to the informants include malaria, jaundice, pneumonia, skin infections, head infections, evil eye and intestinal parasites. The rest are listed in (Table 4). These diseases were treated by 77 plant species (54 plant species used to treat human ailments only and 23 plant species common to both human and livestock ailment treatment). The use of medicinal plants to treat more human diseases than livestock ailments by local people indicated that local community of the study area seek traditional medicine for his ailments first and then try to search for his livestock ailments. Diagnosis and treatment methods depend on the type of the ailment. The practitioners commonly diagnose each health problem by an interview and visual inspection of the patient. The patients are commonly interviewed for symptoms observed and the duration of the health problem, changes in eye, tongue and throat regions, body temperature and status of sores are all visually inspected by the practitioner and the remedy is prescribed. This indicates that in the study area the people have got solutions to their health problems through traditional medicinal plants.

Table 4 Human diseases and number of plant species used

Diseases treated	**Local name**	**Plant species used in number**
Intestinal Parasites	Dhukkuba Marrummani	19
Body Swelling	Dhukkuba Dhullaa	11
Pneumonia	Dhukkuba…….	10
Headache	Bowwo Mataa	8
Wound	Madaa	8
Malaria	Dhukkuba Busaa	7
Skin Infection	Dhukkuba Gogaa	7
Jaundice	Dhukkuba Gara-Muraa	5
Amoeba	Baasaa	5
Teeth Problems	Dhukkuba Ilkaani	5
Gonorrhea	Cophxoo	5
Common Cold	Qofaa	4
Fibril Illness	Michii	3
Vomiting	Haqqee	3
Bloodclot	Kantaruu Dhiigaa	3

Table 4 Continued

Evil Eye	Ija/ Budaa	3
Diabetes	Dhukkuba Sukkaaraa	3
Gastritis	Dhukkuba Garaachaa	3
Head Infections	Madaa Mataa	3
Tonsillitis	Dhukkuba Qoonqoo	2
Glandular Swelling	Dhukkuba Xannachaa	2

Snake Bite	Hadhaa Bofaa	2
Nasal Blooding	Funuuna	2
Cancer	Dhukkuba Nyaqarsaa	2
Sudden Sickness	Maggaanyaa	2
Skin Cancer	Dhukkuba Hooqxoo/Xittoo	2
Cough	Dhukkuban Ukaa	2
Tetanus	Dhukkuba Tetanasii	2
Ascaries	Maagaa	1
Goiter	Hucuba Mormaa	1
Typhoid	Taayfooyidii	1
Eye Problems	Dhukkuba Ijaa	1
Poisoning	Hadhaa	1
Rabies	Dhukkuba Saree Maraattee	1
Blood Pressure	Dhiibbaa Dhiigaa	1
Stop Pregnancy	Irraa Bahuu Ulfaa	1
Anaemia	Hanqina Dhiigaa	1
Vitamin Deficiency	Hanqina Vitaminete	1
Bilharzias	Bihaarziiyaa	1
Breast Cancer	Dhukkuba Harmaa	1
Ear Problem	Dhukkuba Gurraa	1
Asthma	Dhukkuba Asmii	1
Tape Worm	Raamoo Maagaa	1

Source: Field survey, 2019

The table shown, the largest number of plant species (19 plant species) used to treat intestinal parasites following by body swelling which was treated by 11 plant species (Table 4). For disease like fibril illness, evil eye and Jaundice, the local people prefer traditional healers for treatment.

4.4. Major livestock diseases and plant species used

In comparison to human diseases, livestock diseases are treated with a few numbers of plants. A total of 17 diseases were treated by 31 species of plants in the study area (eight plant species used to treat livestock ailments only and 23 plant species common to both human and livestock ailment treatment). Common diseases which affect animals in the study area are associated with pneumonia which is treated by eight plant species, stomach problems which is treated by five plant species and evil eye treated by three plant species and the rest are given in (Table 5).

Table 5 Livestock diseases and number of plant species used

Disease Treated	**Local Name**	**No of Plant Species Used**
Pneumonia	Garaa Kaasaa	8
Stomach Problem	Dhukkuba Garaa	5
Common Cold	Qufaa	3
ConstipationIn Cattle	Dhukkuba Waraansaa	3
Rabies	Dhukkuba Saree	2
Milk Reduction In Caw	Dhukkuba Aannaniin Dhufu	2
Ecto-Parasite	Dhukkuba Silmii	4

Table: 5continued

Leeches	Dhulaandhulaa	1
Wound	Madaa	1
Mastitis	Dhukkuba Harmaa	1
Black Leg	Abbaa Gorbaa	1
Anthrax	Abbaa Sangaa	1
Cadrosis	Gororsaa	1
African Horse Sickness	Dhukkuba Fardaa	1
Cough	Qoffa	1
Breast Cancer	Cancerii Harmaa	1

4.5. Sources of medicinal plants for human, livestock and both human and livestock ailment treatment

From the medicinal plants used to treat human ailments (i.e. 54 plant species), 45 species were collected from the wild and nine species from the homegardens. For livestock's ailment treatment all are collected from the wild and for both human and livestock ailment treatment 19 plant species were gathered from the wild and 4 plant species from home gardens. The findings indicate that the local people obtain more medicinal plants from the wild vegetation than home gardens for treating human ailments. The informants reported that the medicinal plants are found far from their homes. The informants said that they tried to cultivate the plants, but they do not survive the climate conditions and soil types because the plants grew on the side of mountains and shaded areas. This agrees with previous studies of most investigations in Ethiopia that documented medicinal plants were more harvested in the wild than home garden Ermias Lulekal *et al*. (2008) and Etana Tolosa (2007).

4.6. Habits of human, livestock and both human and livestock medicinal plants

The findings showed that medicinal plants used to treat human ailments constitute 22 shrub species, 16 herb species, 11 tree species, and five climber species. This displays that the most represented life forms of medicinal plants in the study area are shrubs followed by herbs, trees and climbers. This could be associated with the abundance and year round availability of shrub species in the area. Trees and herbs are used for the treatment of livestock ailments. There are five tree species and three herb species. The difference from medicinal plants used to treat human ailments was that shrubs were dominant in human ailment treatment but in livestock ailment treatment trees are the common ones. Trees like *Ehretia cymosa, Millettia ferruginea* and *Nuxia congesta;* herbs like *Hibiscus crassinervius, Achyranthes aspera* and *Hypoestes forskaolii* were used for the treatment of livestock ailments only. This finding agrees with the work of Endale Amenu (2007) in which trees are dominant habits for the treatment of livestock Among the medicinal plants in the treatment of both human and livestock diseases the dominant were shrubs with ten plant species, followed by trees with six plant species (26.09%), herbs with five plants species and climber with two plant species.

4.7. Parts of medicinal plant use

During the study different parts of medicinal plants were reported by informants to be used for medicines. The most frequently utilized plant part was leaf with 48(52.7%) species of the total of recorded human medicinal plant preparation, root account for 22(24.17%) and stem bark for 10(11%), seed for 5(5.5%). Leaves, stem bark and roots were the most reported plant parts in the preparations of remedies. Such wide harvesting of barks and roots, which are important for the survival of plants has a negative influence

on the survival and continuity of useful medicinal plants and hence affects sustainable utilization of the plants.

Table 6 Parts of medicinal plant species used by indigenous people

Plant parts	Number of species	Percent
Leaves	48	52.7%
Root	22	24.17
Stem bark	10	11
Seed	5	5.5

Source, Field survey, 2019

4.8. Application of medicinal plants

The traditional healers prepared medicinal plants in different ways and applied it in different methods to the patients. Drinking, painting, chewing, swallowing, smelling, smoking and tied. The findings show that internal ailments were commonly treated by drinking, chewing and swallowing. Skin infections like snake bite were treated by rubbing and painting on the infected part of the body.

4.9. Traditional knowledge transfer to the young

As the findings indicates that the highest ways of gaining knowledge on traditional medicinal plant is father (44%) followed by mother (11%) and brother (9.8%). The others contribute a little on knowledge of medicinal plant (Table 7). Informant's said that, boys have greater chance to gather knowledge on medicinal plants than girls because fathers have high interest to give their talent to their sons.

Table 7 Sources of knowledge on practicing of traditional medicine in the study area: Sources, Field observation,2019

Sources of knowledge on practicing of traditional medicine in the study area	Number of informants	Percent (%)
Father	40	44
Mother	10	11
Brother	9	9.8

Sister	5	5.5
Friends	12	13.2
Other	15	16.5

4.9.1. Threats to medicinal plants

People-forest interaction is determined by the interaction in space and over time of biophysical and human factors. A study of such interaction needs to conceptualize the relationship between the driving forces of human induced changes, the processes and activities among them, and human behavior and organization (Guoren, 1998). In Dinsho Wereda, according to interviewed result from the informants, human driving factors were recorded as the main threats to plant species in general and medicinal plants in particular. The main factors to loss of plant species in the study area are agricultural expansion in relation to population growth, fire, deforestation caused by boundary conflict between people, firewood, charcoal, construction materials and cash crop expansions. According to elderly local informants, most of Dinsho Woreda area was covered with forests until about the 1920s. However, high deforestation rates over the years have left only highly disturbed remnant forests which are now confined to the mountain slopes. During field observations, it was observed that people collect fire wood from the forest by cutting shrubs and trees from the forest and the considerations of the people to the floral diversity is low. The loss of floral diversity in Dinsho Wereda still takes place; According to the traditional healers, nowadays agricultural expansion in relation to population growth, deforestation, cash crop expansion and fire are the main causes of loss of plant diversities in the area and this makes difficult to collect medicinal plants in the area and it subjected the local people to travel long distance to search medicinal plants. In general, the knowledge on medicinal plants become shrinking due to its secrecy, oral based knowledge transfer to close relatives, unwillingness of young generations and influence of modern educations. As a result gradual loss of indigenous knowledge on medicinal plants and loss of floral diversity is takes place in the study area. All the above factors are happening due to lack of awareness on medicinal plants in the study area.

4.9.2. Conservation of medicinal plants

The conservation of traditional medicinal plants in the study area is limited except in areas dominated by *Juniperous- Eucalyptus and Podocarpous-Cordia* plantation, which were the only protected areas inBMNP. Some traditional practitioners had started to conserve medicinal plants by growing them in homegardens.

5. CONCLUSION AND RECOMANDATION

5.1. Conclusion

Eight five medicinal plants species were collected and recorded from Dinsho woreda. The Wereda is relatively rich in medicinal plant diversity. The medicinal plants are distributed in 79 genera and 44 families. Of these, 54 plant species were noted to treat human ailments, eight plant species for livestock ailment treatment and 23 plant species for both human and livestock health treatment. In the study area, 44 different human ailments and 18 livestock ailments were recorded that were reported by informants as human and livestock health problems. From the collected and identified medicinal plants, 70 plant species were collected from the wild and 15 plant species from the homegardens. Some medicinal plants are more preferable than the others in the study area to cure the ailments like pneumonia, jaundice, rabies, skin infection, snake bite, evil eye, malaria, fibril illness, intestinal parasites and typhoid. Shrubs were found to be dominant traditional medicinal plant remedies in the study area followed by herbs, trees and climbers. Leaves were also found to be the most harvested plant parts for the preparation of the remedies followed by bark and roots. Like in other parts of Ethiopia, in Dinsho Wereda medicinal plants were threatened by different factors. Human driving factors were recorded as the main threats to plant species in general and medicinal plants in particular. The main factors to loss of plant species in the study area are agricultural expansion in relation to population growth, fire, deforestation, firewood, charcoal, construction materials and cash crop expansions like *Catha edulis* and sugar cane (*Saccharum officinarum*), are considered the major causes of loss of flora diversity. Other problems threatening medicinal plants are lack of awareness, secrecy, oral based knowledge transfer and unwillingness of young generation.

5.2. RECOMMENDATIONS

Based on the research findings, the following recommendations are given:

- Local people harvest plants from the forest for different purposes with little awareness of its threat, so awareness creation among the society must be done by agricultural workers in the woreda to ensure sustainable harvesting be practiced.
- The local communities of the study area need to involve in conservation and management of plants in general and medicinal plants in particular.
- The Wereda administration must involve in awareness creations on traditional healers to transfer their knowledge to the next generation without secrecy.
- The Wereda agricultural workers must involve in identifying medicinal plants and encouraging the local people to cultivate medicinal plants in their homegardens.
- There is needed coordination of traditional healers at Wereda level that popularize their indigenous knowledge on medicinal plants and create awareness on conservation.
- There is loss of indigenous knowledge in the Wereda, some traditional healers give much attention to the indigenous knowledge transfer and the others have little concern regarding the value of indigenous knowledge, so the Wereda administration must encourage the traditional healers by participating in awareness arising for the healers to minimize the loss of indigenous knowledge.
- Deforestation in Dinsho Woreda natural forests still takes place. So, the administrative body must take care.
- The concerned administrative body must involve in controlling of cash crop expansion.
- Dinsho Woreda has a wealth of medicinal plants for treatment of different diseases ranging from simple to fatal. All people are responsible for the protection and conservation of medicinal plants in particular and our flora in general.

REFERENCES

AberaGeyid, Dawit Abate, AsfawDebela, ZewdnehMekonene, FrehiwotAbera, FrehiwotTeka, TesfayeKebede, KelbessaUrga, KidistYirsaw, TekleleBiza, BisratHailemariam and MulugetaGU, (2005).Screening of some medicinal plants of Ethiopia for their antimicrobial properties and chemical properties. *J. of Ethno pharmacology*(97) pp.421-27.

AlemayehuKefyalew, (2010). Ethnobotanical study of medicinal plants in Ada'aWoreda,EasternShewa Zone of Oromiaregion,pp.M. Sc. Thesis Addis Ababa University, Ethiopia.

AsfawDebela, DawitAbebe and EnsermuKelbessa (1999). An over view of traditional medicine in Ethiopia: Perspective and Developmental Efforts. **In**: *Ethiopian Pharmaceutical Association*. Edn, volume, pp. ------

DawitAbebe (2001a). The role of medicinal plants in healthcare coverage of Ethiopia, the Possible

DawitAbebe (2001b). Biodiversity conservation of medicinal plants: Problem and Prospects.

In: *Conservation and Sustainable Use of Medicinal Plants in Ethiopia. (*MedhinZewdu and AbebeDemissie (eds).Proceeding of the National Workshop on Biodiversity Conservation and Sustainable Use of Medicinal Plants in Ethiopia. Addis Ababa, Ethiopia.

DebelaHundie (2001). Use and Management of Traditional Medicinal Plants by Indigenous People of BoosatWoreda ,Wolenchiti Area: An Ethnobotanical Approach. M.Sc. Thesis, Addis Ababa University.

DesalegnDesissa (2000). Uses and conservation status of medicinal plants used by the Shinasha

people. EWNHS, Addis Ababa.

DemelTeketay (1999). Past and present activities, achievements and constraints in forest genetic resources conservation in Ethiopia. **In**: *Proceedings of the national workshop on forest genetic resources conservation: Principles, strategies and actions.* Pp. 49–72, (Edwards S., AsfawDemissie and TamratBekele (eds). Addis Ababa. Haase G: IBCR and GTZ; 1999.

Dinsho Agricultural and Rural Development Office Report (2008).

Population and housing census of Ethiopia result for Oromia Region vol.1, 2007.

APPENDIXES

COLLEGE OF AGRICULTURE AND NATURAL RESOURCE

DEPARTMENT OF WILD LIFE AND ECOTOURISM MANAGEMENT

My name is FURNO BADASA I am a student in WolkiteUniversity Department of wild life and ecotourism management.This questionnaire is prepared to collect a data for a research entitled "Ethnobotonical study of medicinal plants in dinsho woreda bale Ethiopia**.**So I am asking you a title of your time to help my in this study and I Will like to thank you for spending golden time on my interviews and questionnaires.

Demographic characteristics of respondents:

1 Area information

Region..... Woreda.....

Kebele..... village.....

2 General information of respondent

2.1 Name of interview

2.2 Sex: a) male .....b) female….

2.3 Occupation..... A, Student B, Employer C, farmer D, officer

2.4

Age	20-30	30-40	40-50	50-60	>70

2.5 Marital status:

A, Married B, Unmarried

C, Divorced D, widowed

2.6 Level of education:

A, Illiterate B, can read and write C, elementary

D, high school E, university

2.7 Lived on unarea for .....years. A, 10 B, 20 C, since birth D, 30

II. Questionnaire related to subject matter

3. Health status and use of traditional medicinal plants

3.1 Most of often, before modernization up to present time traditional society use traditional medicinal plant to protect their health and it is commonly known among traditional society in Dinsho Woreda , do you know them?(traditional medicinal plants)?

A, yes B, no

3.2 If question 3.1 is yes, how did you know? From

A, Adaptive management,

B, Interaction and local people

C, Try and error experimentsD,All.

3.3 Do you use traditional medicinal plants to human and animal disease?

A, yes B, No

3.4 Do you know the major human disease in this area?

A, yes B, No

3.5 If your answer is yes for question 3.5, please list them as much as you can

……

3.6 How do you prevent and control these diseases?

…….....

3.7 How do you treat or get treatment of the disease that you know?.....

4.About the traditional plant medicines.

4.1 Least the traditional medicinal plants used by indigenous people to treat humans.

……
……..

4.2Whichtraditionalmedicinalplant Sppsisused by indigenous peopletotreat livestock aliments?

4.3 Which medicinal plants are used by indigenous people to treat both human and livestock aliments?

Species name	Family of medicinal plant	Disease treated	Local name

4.4 Which part of the plant is used as remedy?

A, leaf B, stem C, root

D, flower E, bark F, fruit G, seed

H, whole parts I, others

4.5 Have you ever heard any danger of using traditional medicinal plant Spps in indigenous people (side effect)?

A, yes B, No

4.6 What solutions do people use to treat side effects of the traditional medicine? A, Indigenous knowledge B, by balanced use C, Testing

4.7 What are the ways of transferring of knowledge of the healers to the next generation?

4.8 Are the medicinal plants easily accessible which are used by indigenous people? If not why? A, Yes B, No

4.9 Is there any restriction in collection of medicinal plant? A, Yes B, No

4.10 What are treats to the medicinal plants?

