

CHALLENGES FACING LOCAL COMMUNITIES IN UTILISING AND SUSTAINING
INDIGENEOUS MEDICINAL PLANTS IN THE THENGWE VILLAGE OF THE
LIMPOPO PROVINCE

by

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Declaration

I declare that the work contained in this (mini-dissertation/dissertation/thesis) hereby submitted to the University of Limpopo, for the degree of Master of Development (Master of Development in the field of Agriculture) has not previously been submitted by me for a degree at this or any other university; that it is my work in design and in execution, and all material contained herein has been duly acknowledged.

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ABSTRACT

The main aim or purpose of this study was to look at the ways and the strategies of minimizing mitigating the over-harvesting of indigenous medicinal plants in order to use them sustainably. The task of identifying and assessing challenges facing local communities in utilizing and sustaining indigenous medicinal plants in Thengwe village and their implications on environmental conservation and management of natural resources was done during the pilot survey. The environmental field survey was conducted after gaining permission to enter into the identified study areas including the Mutavhatsindi Nature Reserve. The result revealed that most of the indigenous medicinal plants are used for healing, religious, economical and for protection purposes. Most of the indigenous medicinal plants in the study area are depleted and many of them are facing extinction. The study was qualitative in design. Semi-structured interviews and a questionnaire were used. The questionnaire had both open-ended and closed questions. The study area was Thengwe Village in the Mutale Municipality.

The existence of medicinal plants is threatened by people's perceptions and attitudes towards them. For some indigenous medicinal plants, depletion is at a high rate due to over-harvesting and because the plants when traded by herbalists they have a premium price attached to them. Interestingly, perhaps surprisingly, the majority of young people hold negative attitudes towards the indigenous medicinal plants due to poor knowledge of the value of indigenous medicinal plants, in contrast to the elders who appreciate their role and consider them as part of their culture, economy and religion.

One of the findings is that medicinal plants were found to be important to the community members as the source of income and creation of jobs for the medicinal collectors who sell the species to traditional healers. For the reason of preserving indigenous medicinal plants and others as the environmental resources, this study recommends that there should be strong intergovernmental relationships between the National, Provincial and Local governments in order to prevent over-harvesting of the medicinal plants. The indigenous medicinal plants are equally important to biodiversity students and researchers who want to study and research indigenous medicinal plants which play an important role in the improvement of the livelihoods of community members.

Furthermore, education campaigns within the communities and school learners are recommended to encourage the prevention, sustainability and utilization of the indigenous medicinal plants. Additionally, the legal authorities should be empowered to prosecute all people who may be found illegally in possession of indigenous medicinal plants, as well as endangered and protected species. Heavy fines and charges should be imposed on such culprits.

Of importance is the fact that the results and recommendations of this study may facilitate the teaching of environmental education and management of natural resources as well as boost the local economy of the Vhembe district Municipality by showing that medicinal plants in the area can be seen as a viable tourist attraction.

DEDICATION

This work is dedicated to:

My wife Vusani Livhuwani and my son Phophi who tolerated my long absence when this study was undertaken

My grandmother, Phophi Mudimeli who my source of inspiration in all spheres of my life

My mother, Masindi Sithavhakhomu and my sister Joyce who financially supported this study to its success

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Chapter 1: INTRODUCTION

1.1. Background of the study

It is indisputable that the nations around the globe, communities, government institutions and non-government organizations are battling in making policies, strategies and regulations that fight against the depletion and any factor that destroys the environmental resources. The depletion of the environmental resources has been realized to be the greatest factor that results in the global warming which leads to the disastrous events in the world and other economic effects. Among other environmental resources which need serious attention of sustainability and utilization are the indigenous medicinal plants which are part of biodiversity. Mabudafhasi (2006) indicates that, most countries which are signatory to the convention on biological diversity are already shifting their policies and laws from a narrow focus on the protection of only natural resources towards a more holistic conservation approach which takes into consideration the socio-economic development issues for rural communities.

Countries around the world have introduced rules and regulations that control the utilization of those indigenous plants especially those which have medicinal properties. These indigenous medicinal plants are facing the challenges of depletion as a result of medicinal properties they have. Besides the medicinal properties challenge they have, they are also affected by cultural factors, unemployment problems, population growth and other challenges. Many reports tell of great demands for indigenous medicinal plants by people within the country and around the world. Dold and Cocks (2002) report that the trade in traditional medicines forms part of a multi-million rand 'hidden economy' in Southern Africa stimulated by the high population growth, rapid urbanization, unemployment, and the high cultural value of traditional medicines.

South Africa like other countries, through its Departments of Environmental Affairs and Tourism as well as the Department of Water Affairs and Forestry have set regulations within the inter-governmental levels that will prevent people from destroying the environmental resources. In one of its principles, National Environmental Management Act No. 107 (1998) promotes intergovernmental coordination and harmonization of policies, legislation and actions related to the environment. The tripartite cooperation among the levels of South African governments in saving the environmental resources would have been playing a vital role if all levels were strict and harsh

to those who utilize the environmental resources in an unsustainable way. Mander in Dold and Cocks (2002) estimate that there are 27 million indigenous medicine consumers with a large supporting industry in South Africa. This is to indicate that the environmental resources of South Africa are in one way or another utilized not in a sustainable way. In concurring with that Dold and Cocks (2002) indicate that, the use and trade of plants for medicinal purposes is therefore no longer confined to traditional healers but has entered both the formal and informal entrepreneurial sectors of the South African economy. This implies that there are some people who do not have indigenous knowledge of using medicinal plants but who are to earn money.

In the Limpopo Province the Thengwe Villagers are facing a great challenge in which they are demanding the preservation of indigenous medicinal plants which leads some people to poaching on those medicinal plants. In poaching some of the roots of medicinal plants are left uncovered with the soil and that result the destruction of the species. Williams et al in Lawes et al (2004) indicates that, the roots of *Brakenridgia Zanguebarica* which is a well known indigenous medicinal plant in the area of Thengwe, in 2001 were found in 10% of 50 shops surveyed in the Witwatersrand, where it is known by several different names. Realizing that their environmental resources are facing depletion, the Thengwe inhabitants have come up with different strategies of conserving their resources with the help of the government. Among the strategies, they use the traditional way and modern way of conserving their environmental resources especially the IMP.

1.2 Problem statement

The people within and outside the Thengwe village flock to the nature reserve and around it to gather the medicinal plants for curing the diseases, economical use and culturally use. As a result, indigenous medicinal plants are getting depleted and potential benefits are lost. Because of this depletion the poor people in the area are exposed to various sicknesses which could be cured in the past before the poaching began.

It is hoped that, the local and outside communities will appreciate nature and the environment and as a result they will be prepared to protect the environment in which some of these medicinal plants grow. The study may also empower the communities together with their stakeholders to device the best methods of utilizing and sustaining their indigenous medicinal plants.

1.3. Research questions

1.3.1 What are the perceptions and attitudes of the communities towards sustaining and utilizing the medicinal plants?

1.3.2 What role should the community play in sustaining the medicinal plants?

1.3.2 What challenges are the local communities facing with regard to the utilization and sustaining of the medicinal plants?

1.4 Motivation for the study

The study of these medicinal plants will help people who will go through this document to acquire helpful knowledge of the medicinal plants found in the Thengwe area and what their uses are and can always be. The study will motivate herb collectors and traders who are within the communities of Thengwe and foreigners, to stop poaching the species. People will protect the indigenous medicinal plants through the data they will have received which in turn will educate them in the value of these species. Through this study, the people will have knowledge of their own environment and therefore do all they can to protect it for the benefit of many people

As it is a study dealing with long term life issues of the environment, the research project will assist in the development of the area for tourism through sustaining the environmental resources. As a result of the development, money will be generated and more jobs will be created and life will be more enjoyable than it has been hitherto. When people are employed and they sustain their families from the money they will vehemently fought against poaching. Local people who are prevented from using their resources will be able to utilize the plants efficiently and effectively. This study is of vital importance as it will encourage the population in those species which were to be allowed to grow in large numbers without disturbance.

1.5 Aim of the study

The main aim of this study is to look at the ways and strategies of minimizing/mitigating the over-harvesting of indigenous medicinal plants in order to sustain them and use them if need be.

1.6 Objectives of the study

The objectives of this study are to:

- Determine the perception and attitudes of the communities towards sustaining and utilizing the medicinal plants.
- Examine the challenges that the local people of the Thengwe Village are facing in the utilization of those indigenous medicinal plants as their environmental resources.
- Find out what role the people of that area can play in sustaining their indigenous medicinal plants for the good of every deserving person.

1.7 The significance of the study

The study is of extreme importance to the people of the Limpopo Province especially those in the Vhembe District. The study encourages the involvement of the community members to promote the sustainability and utilization of the indigenous medicinal plants. Researchers from the nearby universities will be enabled to conduct research projects without difficulties that have been confronting them so far.

The study will enhance the indigenous knowledge to the communities which will help them on how to use their medicinal plants profitably. Traditional healers will benefit from the study because medicinal species will no longer be depleted and face extinction. The Department of Environmental Affairs and Tourism, Department of Water Affairs and Forestry and The Department of Agricultural Science will also benefit from the study as the project will execute their policies. The project will benefit the environmental area where the medicinal plants grow through rehabilitation from their degraded state.

1.8 Definition of concepts and Abbreviations

1.8.1 Definition of concepts

1.8.1.1 Indigenous knowledge

Indigenous knowledge (IK) is the knowledge that is acquired by the people in a particular area through interacting with their environment. Payle and Lebakeng in Masoga Musyoki (2001) regard indigenous knowledge as a vital knowledge which is acquired from the environment and as a result of people studying their environment for the good of everybody.

1.8.1.2 Indigenous people

Indigenous people are those people who by genealogy or history have occupied an area for a long time. In defining the concept indigenous people are those people who, because of historic affiliation or for political reasons, are considered belonging to a particular area. Brueng (1998) note that, indigenous people, are people who, because of historic affiliation or for political reasons, are considered to belong to an area.

1.8.1.3 Traditional medicine

Traditional medicine is the medicine extracted from indigenous medical plants by the indigenous people inspired by their ancestors and using the indigenous knowledge they have acquired through interact with their environment, in that particular area.

Timmermans (2003) also defines traditional medicine as the sum total of the knowledge, skills, and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illnesses. Netshiombo (1997) refers to these medicinal plants as traditional medicine and as the medicine of the people by the people and for the people, which have been used and practised and handed from generation to generation.

1.8.1.4 Sustainability

Sustainability is the capacity by which project(s) through man management, is/are satisfactorily capable of meeting the present human needs for a long time while not sacrificing the needs of the future generations. Brueng (1998) asserts that, sustainability encompasses the total natural and anthropogenic states and processes by which qualities and quantities of energy, material or immaterial goods of the system and its environs are served appropriately/ adequately and satisfactorily.

1.8.1.5 Conservation

Conservation is the maintenance of the environment quality and resource within the species present in a given area or place. Gwin, R.P. Norton, P.B. & Mchenry (1993) regard conservation as the planned environment of a particular ecosystem to prevent exploitation, pollution, destruction, or neglect and to ensure the future use of the resource.

1.8.2 Abbreviations

1.8.2.1 IMP – Indigenous medicinal plants

1.8.2.2 IK- Indigenous knowledge

1.8.2.3 IKs- Indigenous knowledge system

1.8.2.4 MNR- Mutavhtsindi Nature Reserve

1.8.2.5 MP- Medicinal plants

1.8.2.7 NEMPAA- National Environmental Management Protected Areas Act

1.8.2.8 NEMA- National Environmental Management Act

1.9 Outline of work

1.9.1 Chapter 2 entails the information from different sources of different authors which contain the relevant information that the researcher is looking for supporting his or her study. This chapter also includes the critical analysis made by the researcher with regard to the information he or she acknowledges from different sources.

- 1.9.2 Chapter 3 is research methodology. In this chapter the methodologies or techniques that the researcher will use to get the information from his or her respondents is clearly articulated. The chapter also shows the sampled respondents and also the types of sampling which have been used.
- 1.9.3 Chapter 4 is data analysis and interpretation. In this chapter data or information collected is critically analyzed and interpreted in an understandable way. Graphs and charts are interpreted in simple language.
- 1.9.4 Chapter 5 consists of conclusion, recommendations and implications. The chapter indicates the findings of the research problem; from those findings the researcher recommends things to be done to minimize or solve the problem. In this chapter the researcher also indicates the possibilities and impossibilities of implementing the recommendations.

CHAPTER 2: Literature review

2.1. Introduction

The sustainable utilization of indigenous medicinal plants is part of environmental resource management and it is important to all communities particularly in the rural areas of all countries. However, many countries, departments, non governmental organizations and communities are faced with great challenges when they try to utilize the medicinal plants in a suitable way. The challenges are encountered as a result of economic factors; socio-cultural factors, population pressure and technological advancement, overharvesting, indigenous and strategies for preventing over-harvesting.

2.2. Economic factors

Indigenous medicinal plants generate large sum of money into the coffers of medicinal plants collectors and traders in many countries around the world. This fast growing business activity as an economic factor has created serious problems of depletion and extinction to the species. Cunningham et al (1993) assert that, one form of rural self employment is the collection of indigenous medicinal plants as a source of income.

Nickel and Sennhauser (1995) indicate that, the international trade in medicinal plants both within South Asian Countries and in East Asia, Europe and North America is growing tremendously (claim 2) reasons being that more than 90% of the medicinal plants exported from Nepal to India, earning an estimated 115\$ 8, 6 million annually (claim 3 support authority; 2). They further(1995)indicate that, to evaluate how medicinal plants and other forest products influence local, national and international economies, the government of Nepal and the World Bank are collaborating in the study of forest resource management and its impact on Nepal's ecology and economy. Lacking at the economic value of medicinal plants, people turn the collection of medicinal plants into a business activity which is leading towards a negative impact to the species which consequently cause the extinction of the plants.

Kuipers et al in Bodeker (2005) note that, when international trade in medicinal plants grew to a multi-billion dollar industry, local harvesting to commercial patterns shifted from sustainable local harvesting to commercial gathering without any regard for the regeneration, of the species for the

future yields (claim 4: reason, economic). Market condition here seen to be working against environmental needs (Kuipers et al in Bodeker 2005). They confirm that when indigenous medicinal plants are used for economic benefit people gather them in an unsustainable way without considering their use by future generations. Again when the species are gathered for commercial purposes it is easy for them to be finished.

Nationally, the indigenous medicinal plants are also considered as vital environmental resource products used to generate income in most of the African communities. Dold and Cocks (2002) indicate that, the demand for the plant medicines has created flourishing trade in indigenous medicinal in South Africa. Currently estimated to be worth approximately R270 Million a year. (claim 5 support authority 3 and 4, reason economic). In South Africa this business is no longer confined to traditional healers but has entered both the informal and formal entrepreneurial sectors of South African economy, resulting in an increase in the number of herbal gatherers and traders (Dold and Cocks (2002). These indicate that, the medicinal plants gathering nationally are doing a negative impact on the environment and the species themselves. (Dold and Cocks (2002) identify *Rubia petiolaris*, *curtisia dentate*, *Haworthia attenuate* and *Gasteria bicolor*, *ilexmitis*, *Rapanea melanophloenos*, *Protorhus longifolia*, *Bulbine latifolia*, *Hypoxis hemerocallidea*, *Helichrysum adoartissimum* and *Rhoicissus digitata* as the most expensive medicinal plants which generate a lot of income in the Eastern Cape Province of South Africa (claim:6). These expensive medicinal plants in the area are the ones which have indicated that they are to be facing depletion through overharvesting.

The Limpopo Province like other regions is also experiencing problems of sustaining indigenous medicinal plants as a result of the economic factors. The fact that, the province is comprised of the former Bantustan homelands characterized by commercial gathering of medicinal plants is at the alarming high rate. In the Limpopo Province (muti) herbalists are forced to overharvest most of the medicinal plants because of their usefulness within the communities and other societies in other provinces and abroad. Williams et al cited in Lawes et al (2004) note that, roots of *Brakenridgia – Zanguebarica* in 2001 were found in 10% of 50 shops surveyed in the Witwatersrand, where it is known by various names(claim 8). Ndou in Lawes et al (2004) indicates that, when *Brakenridgia – Zanguebarica* is harvested, its roots and bark carry high prices, with approximately 10cm of the root selling for R150(claim:9, support authority 8 reason : economic reason. other over used and

over marketed medicinal plants, in the Limpopo Province especially in the Vhembe District are *Osyris lanceolata Hochst and Steud (Mpeta)*.

The rod of this medicinal plant is used to promote the business of selling traditional beer. The fact that *Brakenridgia – Zanguebarica* in the Limpopo medicinal species, is in great demand and is found in many shops around the Gauteng Province and is sold at a high price, is a clear indication that in the Limpopo Province the species is also generating a lot of income especially for the herbal collectors (Todd et al, in Lawes et al 2004). The market and demand for these medicinal plants in the local and outside areas is not generating revenue to medical collectors as a good thing, but it is also doing injustice to the species as they are facing depletion as a result of overharvesting them.

2.3. Socio- cultural factors

The socio-cultural activities in many communities sometimes play a negative role in leading to the depletion and extinction of certain species. These medicinal plants are used internationally, nationally and locally in social life activities such as health and security for the lives of the people. Again they are used for cultural activities such as arts. When all activities are done many species are found in the risk of depletion and extinction to scarce species. In concurrence with Mabogo (1990) indicates that a thicker rod or wooden spoon made from *Osyris lanceolata Hochst and Steud(Mpeta)* is used for stirring traditional beer (Mahafhe) so that people would drink peacefully without any quarrels or arguments as they drink.

2.3.1 Health factors

The indigenous medicinal plants help people to cure many diseases. The majority of the people around the globe depend on indigenous medicinal plants for their good health. Mia and Chowdnury (2003) indicate that the Mro tribe in Bandarban region, Bangladesh was found to be the most dependent on herbal treatment hence they were found to have a great understanding of medicinal plants too (claim 10 reasons, health reasons). Nickel and Sennhauser (1995) also indicate that, more than 80 percent of the people in South Asia rely on herbal remedies as a principal means of prevention and curing illness, and several traditional medicinal systems are based on the medicinal plants (authority 11 support authority 10 reasons, health). The fact that, the highest percentage of communities around the world depend on the medicinal plants for their primary health, threatens the species as people turn to collect the species for commercial purposes.

Nationally, the indigenous medicinal plants still play a vital role in curing the different illnesses that people suffer from. Nevertheless when these species are used and seen to be in great demand, they become threatened as a result of exploitation. Thiring and Weitz (2005) write that in South Africa, many people still use plants as medicines as an alternative or supplement to visiting a western health-care practitioner(claim 11 support authority 12 reasons, health reason) . Meyer and Afolayan in Grierson and Afolayan (1999) also confirm that, the indigenous people of South Africa, for centuries, have relied on herbal medicine for aspects of their primary health care. It is estimated that between 12 and 15 million South Africans still use traditional remedies from as many as 700 indigenous plant species. This shows that the indigenous medicinal plants are perceived to be more useful than other medicines by indigenous South Africans and are considered as extremely potent. Grierson and Afolayan (1999) indicate that, although many rural communities now have access to mobile clinics and hospitals, there is still, to a large extent, a belief in herbal medicine, possibly due to an inherent distrust of anything western. Thiring and Weitz (2005) identifies *Artemisia afra*, *Mentha longifolia* and *Leonotis leonurus* as medicinal plants in demand and commonly used in Zulu, Xhosa and Sotho to cure illnesses like gastrointestinal and respiratory disorders, headaches, fevers and snakebites (claim 13 support authority 12). The demand which these medicinal plants are facing is at a national level, also contribute towards the exploitation which leads to species depletion.

Most people are in favour of using indigenous medicinal plants to treat their different diseases. Their area which is situated far from Thohoyandou encourages them to live their African social life which depends upon medicinal plants for primary health. Todd et al in Lawes et al (2004) indicate that the traditional healers among the *Vhatavhatsindi* group in the Limpopo Province used the roots and bark of the *Brakenridgia Zanguebarica* to treat various problems, including wounds, swollen ankles, amenorrhea, worms and mental illnesses, as well as a number of undisclosed diseases. Mabogo (1990) asserts that, infusion of the root *Euphorbia tirucalli* (Mutungu) is used as a remedy for pains in the body. Although it is said to be toxic, it is still used medicinally in small concentrations (claim: 15 support authority14, the reason people want to heal their sicknesses). These mentioned indigenous medical plants are among the greatly demanded species in the local area of the Thengwe area and because of their importance, they are at risk of depletion and extinction.

In concurrence with the above idea, Williams et al in Lawes et al (2004) indicate that, the roots of *Brakenridgia Zanguebarica* which is a well known indigenous medicinal plant in the area of Thengwe, in 2001 were found in 10% of 50 shops surveyed in the Witwatersrand, where it is known under several different names. (Claim 16 reasons, they are most demanded medicinal plant).



Figure 1: *B. Zanguebarica*, one of the most overharvested IMP

Tshisikhawe (2002) indicates that, of the medicinal plants found in the shops visited, 61% were in the forms of roots, 22% in the form of whole plant, 15% in the forms of barks, 1% in the form of fruits and others 1% in the form of leaves(claim 17 support authority 15 and 16). He further (2002) maintain that, the plant parts most sensitive to harvest are the ones that are most exploited. Looking at the statistics of the harvested plant parts given, it is clear that there is a need for sustaining the species for the future.

2.3.2. Religious beliefs

Indigenous medicinal plants are part of the culture of many societies around the world. Being part of the culture of many societies, medicinal plants face challenges of exploitation which lead them to depletion of the species

People believe that when their bodies are not healthy IMP should be used or applied to restore health. They again believe in using IMP to protect themselves against the evil spirits which can cause undesirable conditions on the members of their families and also protect them from any misfortunes sicknesses .They also believe in being protected from the evil spirits which can cause undesirable conditions on the members of their families.

The Zay people in Ethiopia used the roots *Solanum in canum* to protect themselves against snakebites (Giday K.G, Wasescha,M. & Bork P, 2003). Around the world people do not believe that they have to meet difficulties in their lives and if it happens the suspicion is that, it is attributed to an enemy. According to Joshi and Joshi (2000) the local communities of the kali Gndaki Watershed area Nepal , attribute most of the complicated ailments and other misfortunes to supernatural origin due to soul loss, spells or curses cast by evil spirits as a result of, the displeasure of the ancestral godlings, or by the breaking of religious taboos (claim 18 reasons; it is a cultural belief). As a result people do not want to meet with such misfortunes, the medicinal plants used to word off such conditions, turn to be in demand and at risk of depletion and extinction as a result of overharvesting.

In South Africa, people use medicinal plants for life protection purposes. The use of medicinal plants for these purposes is challenging the life of the species and threatens their future existence. Communities are also facing problems when preserving them due to their demand within the consumers. Cocks and Moller (2002) indicate that, medicines for good luck and fortune are among

predominantly purchased for personal use rather than for illness and other household members (claim 19 support authority 18). They further (2002) assert that, *Umlomo Mnandi* medicinal plant is greatly used by most people in South Africa for luck and fortune when they look for employment, and luck in a court case (claim 19 support authority 18). Simon and Tooke in Cocks and Moller (2002) indicate that, *Intelezi-Gasteria bicolor* as a medicine is prescribed during times of illness and hardship to protect people from the intention of evil-doers (claim 20). With regard to the protection of infants, Cocks and Moller (2002) indicate that in order to protect the infants from evil spirits or from getting them out, Xhosa people grind the bark of *Itshangwe* into a powder and mix it with water and syringe it inside a ball point pen and get it into the baby (claim 21 support authority 20, the reason being protection of the people against undesirable conditions).

In the Limpopo Province the local communities use the indigeneous medicinal plants especially in protecting their families against witchcraft. People believe that, the medicinal plants have power to protect them from any powers which can attack them during the night. Mabogo (1990) indicates that the Vhavenda group uses powder from the bark of the roots of *Salix Mucronata Thumb (Munengeledzi)* as an important ingredient of the maginal mixture used, for protecting homesteads against witches and wizards (claim 22). When such maginal powder is used the whole homestead will appear growing along the banks of the river (Mabogo:1990)(claim 23). In concurrence with this, Ndou in Lawes et al (2004) indicate that, the *Brackenridgia Zanguebarica* is also used in the Limpopo Province to protect people from any attack or bewitchment, and houses from evil spirits associated with lightening strikes(claim 24 support authority 22 and 23). As a result of being in great demand, medicinal plants need to be used in a sustainable way (in order to be used in a sustainable way) so that they may be used by the future generations.

2.3.3 Cultural factors

The indigenous medicinal plants are also exploited within the communities by being used to perform some cultural activities.

Globally, the indigenous medicinal plants used to carve useful and decorative materials. Shackleton et al (2002) indicate that in the Mutanda Resettlement Area, Zimbabwe, *S.birrea* formed one of the three most popular species for making musical instruments. They further (2002) indicate that *S. birrea* is used by 55% of household in *Mberengawa* (western Zimbabwe) to make

utensils (claim 25). Only the indigenous medicinal plants which are in tree form are used and again the sensitive plant parts which may cause depletion or destroy all the plants are mostly used. Clark et al in Shackleton et al (2002) indicate that, marula wood has been traditionally used for carving pestles and mortars, bowls, drums, beehives and stools and even, in some areas (e.g. Malawi), for making canoes(claim 26 support claim 25). By using the medicinal plants in carving materials, species are facing extinction and depletion.

Nationally the medicinal plants are also used in different activities. In some cases these medicinal plants are used to weave products such as mats, clothes and many other things. Steenkamp in Shackleton et al (2002) indicate that, in the regions bordering the Kruger National Park in South Africa, *S. birrea* is harvested to carve animals which are (Leopards and antelope ranging in size from less than 30cm to more than 2m tall) and sold mainly at the roadside to tourists. They (2002) further indicate that, the role of *S. birrea* in the regions bordering the Kruger National Park, that its wood is used to carve animals figures which assist to attract tourists who visit the park(claim 27 support claim 25 and 26 reason, cultural activities). The use of medicinal plants in this form is creating a negative impact on the medicinal species as the form rapidly causes the depletion and extinction.

The use of *Osyris lanceolata Hochst and Steud (Mpeta)* in the Vhembe District of the Limpopo Province is also making an impact on the medicinal plants. The communities where the species grow also face some problems of how the plant can be sustainably harvested as its demand is very high. The species are greatly used for cultural activities and are mostly used by women. Mabogo (1990) indicates that a thicker rod or wooden spoon made from *Osyris lanceolata Hochst and Steud (Mpeta)* is used for stirring traditional beer (mahafhe) so that people would drink peacefully without arguments or fights as they drink.

He (1990) further indicates that, *Osyris lanceolata Hochst and Steud (Mpeta)* as a magical medicinal plant is also extensively used by wives in the form of a wooden spoon which they used when cooking any food so that this medicinal plant would magically make their husbands love them and stay with them peacefully (authority 28 support authority 27 reason cultural belief). As a result of its magical power, the spoon of this species is almost needed by every married woman and unmarried to use them in cooking food for their concubines. Because of the demand, the species where they grow is found in a family area.

The use of medicinal plants in cultural activities in many communities benefits the societies while the plants in some activities are in disadvantageously of facing depletion and extinction. In the Thengwe area the use of medical plants such as *Osyris lanceolata Hochst and Steud* (Mpeta) is acceptable in cultural activities as the plant is used to make wooden spoons which are part of cultural activity. The use of this species in this form enables the species to be sustained as the spoons carved from this species are only used for special occasions and not for daily activities. This is confirmed by the idea indicated by Mabogo(1990) when he says *Osyris lanceolata Hochst and Steud* (Mpeta) as a magical medicinal plant is also extensively used by wives in the form of a wooden spoon which they use when they cook food so that this medicinal plant would magically make their husbands love and stay with them peacefully.

The use of *S. Birrea* in the areas next to Kruger National Park is not acceptable because the species is curved to make animal figures to be sold to tourists. The use of the species in this form does not sustain the species. To support the idea Steenkamp in Shackleton et al (2002) indicate that, *S.birrea* is harvested to carve animals which are sold mainly at the roadside to tourists.

2.4. Population pressure and Technological advancement

Population pressure and Technological advancement have an impact on the biodiversity. Population pressure leads to the extension of settlement areas, which in turn leads to the destruction of the forest and put medicinal plant sand and other species in the risk of depletion and extinction. Infrastructure and other technological developments are important to human life, but they have negative impact on the wild life especially of plant species. For a development of infrastructure to occur, a large number of plants, medicinal plants included have to be cleared and destroyed. Such claims on wild life plants are a problem all over the world.

Internationally the fact of population growth and the Technological advancement play a negative role in biodiversity like when the population grows, people need more space for living and more space for infrastructure development. Taylor (2004) indicates that most rainforests are cleared by chainsaw, bulldozers and fires for its timber value and then are followed by farming and ranching operations, even by world giants like Mitsubishi corporation, Gerogia pacific, Texaco and Unocal(claim,30). This is to indicate that biodiversity especially plants are being destroyed for the

sake of the expansion of human settlement and technological development. Meyer(2005) indicates that, factors which led to the rapid destruction of the forest are such as weak governmental policies, an increase in trade liberalization, industrial logging and human population pressures(claim :31 support authority:30).This means population growth has a serious effect on IMP. Giday et al (2002) indicate that, migration from rural areas to Urban areas, and resettlement of the people from drought stricken regions to fertile areas have also resulted in the deterioration of traditional practices (claim 32, evidence: of 33 medicinal plants used locally in Ethiopia, 10 medicinal plants were reported scarce).

Dold and Cocks (2002) indicate that, the trade in traditional medicines forms part of a multi-million rand hidden economy in Southern Africa stimulated by high population growth, rapid urbanization, unemployment and the cultural value of the traditional medicines(claim 33). This is to indicate that the commercial gathering of medicinal plants is influenced by the increase of people and the move to the urban areas and the expansion of the urban settlement areas. The population growth has pressure on medicinal plants because it results in unemployment which in turn unemployed people created jobs for themselves by collecting medicinal plants. Mander in Dold and Cocks (2002) estimate that, there are 27 million indigenous medicine consumers in South Africa with a large supporting industry (claim 34 support claim 33 reason population growth causes effect to IMP. The greater population number that uses medicinal plants is putting pressure on few medicinal species which are available and hence it is easier for medicinal species to be devastated.

This situation of population pressure and technological advancement which is happening internationally and nationally is also experienced locally in the Limpopo Province. Todd et al in Lawes et al (2004) indicate that, over the past few years, population pressure in the Thengwe District has increased, leading to higher levels of natural resources harvesting and land transformation(claim 5 support authority 4).

They (2004) further indicate that, there is a heavy reliance on natural resources (61% of people) and the vegetation has been severely degraded through wood harvesting and grazing by domestic animals(claim 35, reason: the tarred road constructed in the area destroyed many species). An existing gravel road that serviced the area was modified and tarred in 1989-90.



Figure: 2 Construction of the road that destroyed IMP

This road ran through the population of *Brackenridgia Zanguebarica* and more than 80 trees were damaged or destroyed in the process of its upgrading (Todd et al in Lawes et al, 2004)(claim 36 support claim 34 and 35). This indicates that the population pressure and technological development have a serious negative impact on medicinal plants.

Population growth is a great threat to the medicinal species as when population grew more space for human settlement needed whereas vegetation is destroyed. The population growth in many cases is accompanied by the expansion of the settlement areas and technological advancement which cause threats and causes depletion to the plants. This is supported by what Meyer (2005) says that, the factors which led to the rapid destruction of the forests are such as weak governmental policies, an increase in trade liberation, industrial logging and human population pressure. The occurrence of the entire above issue acted against the survival of medicinal species.

2.5. Overharvesting

Overharvesting is the most devastating occurrence that plays an undeniable negative role in the growth of the indigenous medicinal plants and other plants in general. The overharvesting is influenced by many factors such as unemployment, population pressure, technological advancement and a few other occurrences.

Globally the improper harvesting destroys a large number of plant species in which some species face extinction. Bentley (2001) indicates that, large quantities of medicinal plants usually collected; for example, an estimated 65 million goldenseal and 20 million ginseng plants were collected from the forests of the Eastern United States in 1998 (claim 37). This quantity of the medicinal plants is more than enough for these species which are very scarce . The collection of this form leads to the depletion of the plants. Bodeker (2005) indicates that, demand for herbal medicines in the North has led to significant changes in traditional patterns of medicinal plant harvesting and, as in the case of *Prunus Africana* in Cameroon, has placed some species under threat (claim 38 support claim 37 reason bulk harvesting of IMP is leading to depletions). This method of harvesting medicinal plants does not bring good results to the species instead; it causes degradation of the environment as a whole.

Nationally in South Africa the overharvesting of the medicinal plants leads to species loss because other species are holistically useful to the traditional healers. Dold and Cocks (2002) indicate that, demand for plant derived medicines has created a trade in indigenous plants in South Africa currently estimated to be worth approximately R270 million a year(claim 3). They (2002) further state that, this is stimulated by high population growth, rapid urbanization, unemployment and the high cultural value of the traditional medicines (claim 39 support claims 38 reasons: overharvesting is caused by economic factors that lead to depletion of species). As a result of the population growth and the South African communities are experiencing a serious problem of sustaining the indigenous medicinal plants as some are becoming scarce species.

The improper harvest of Indigenous medicinal plants creates serious challenges to the communities of the Limpopo Province especially those in the Thengwe village as many and scarce species are lost in the area. The studies done in the Province show that in many cases the challenges are influenced by grazing, wood collecting and untrained herbal collectors. Todd et al in Lawes et al (2004) assert that, outside the Mutavhatsindi Nature Reserve (MNR), the vegetation is highly degraded due to over-harvesting from wood collectors and grazing by domestic animals (claim 40 support claim 39). The increasing demand for traditional medicines has changed the way in which these plants are collected (Todd et al in Lawes et al, 2004) (claim 41). This is to say that overharvesting of the indigenous medicinal plants is prompted by the increase of their business and is leading to depletion and extinction of the plants in the area.

In concurrence with the above idea, Williams in Lawes et al (2004) indicate that, collecting was the domain of traditional healers using customary harvesting practices, but untrained commercial collectors now harvest plant material illegally and are cause extensive damage to plant population(claim 42). Todd and Van der Waal in Lawes et al (2004) indicate that, uncontrolled harvesting of *Brackenridgia Zanguuebarica* has been high, leading to a decline (89%) in density from 140 trees per ha in 1990 25 trees per ha in 1997. This statistics are evidence of the decrease of the medicinal plants in the local area indicating that the improper harvesting is making an impact on that area and creates a challenge to the communities.

It is true that collection of medical plants in a way that Bantley (2001) indicates when he says, large quantities of medicinal plants are being collected, for example, an estimated 65 million goldenseal and 20 million ginseng plants were collected from the forests of the Eastern United states in 1998 cannot be regarded as normal harvest as it destroys large quantity of plants at a time. In the Thengwe area the harvest way done by traditional healers was accepted. The problem arises when other people collect for business sake as they no longer do justice to the plants. In supporting this idea, Williams in Lawes et al (2004) indicate that, collecting way the domain of traditional healers using customary harvesting practices, but untrained commercial collectors now harvest plant material illegally and cause extensive damage to plant population.

2.6. Strategies for preventing overharvesting.

When realizing that the Indigenous medicinal plants are devastated as a result of their vital role within societies, different societies, Non- governmental organization and government departments introduced and implemented different strategies and policies as a way to minimize the overharvesting of the Indigenous medicinal plants. Among the strategies used and implemented, some managed to minimize the situation but others have failed and left room for other strategies to be implemented.

Tchamou (2010) indicates that, "The main form of monitoring and regulation of international trade in certain medicinal plants is through the convention of international Trade in Endangered Species of Wild fauna and flora (CITES)".(claim 43). The conservation of Indigenous medicinal plants considered to become only successful if countries follow the international regulations than following their own countries, Tchamou (2010) maintains that "In Bhutan, laws passed to ban the collection

of specific plants effectively increased their price and stimulated illegal harvesting, which virtually drove them to extinction locally(claim 44 support claim 43). Although the strategies for preventing the IMP internationally are applied they have consequences they left in the species. The White paper on Environmental Management policy (1997) promotes the conservation of biodiversity through promoting the conservation and the sustainable use of biodiversity at the international level, these different strategies and policies implemented, minimal improvement realized.

Nationally, the introduction of strategies that enable people to conserve the medicinal species, the policies, regulations and laws were made by non-governmental institutions, community structures and government to conserve IMP. The Department of Environmental Affairs and Tourism introduced a National Environmental Management Act No. 107(1998:1) indicate that , everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development(claim 45 support authority 44). This act introduced by the Department of Environmental Affairs and Tourism as an attempt to minimize the problem of depletion of the environmental resources within the country. Although the use of this act is not the responsibility of the relevant department but it is also of others, the dream is not realized the way it was intended.

In the Thengwe area, structure and relevant stakeholders also introduced strategies that could work against the extinction and depletion of the important IMP.However, the agreement between relevant stakeholders made to preserve the IMP, challenges from these structures, failed some of the strategies. The provincial, Department of Agriculture and Environment was responsible for the maintenance and development of the Mutavhatsindi Nature Reserve(MNR) (Lawes et al 2004) (claim 46).Lawes et al(2004) indicates that, the financial constraints led to an initial delay in fencing the reserve and until mid- 1997 restructuring and budgetary considerations meant that staffing was limited and temporary(claim 47).The fact that, the Provincial Department was committed as such, created challenges to strategies for preventing overharvesting of medicinal plants, Lawes et al(2004) maintain that the tribal council and the community are also involved in policing the area together with the South African Police Service(claim 46 support claim 47: reason application of different strategies to preserve IMP.

In order to avoid the depletion of medicinal plants strategies need to be implemented either by the government or the communities concerned. Again one could agree with the implementation of the NEMA as it promotes the protection of the species through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. The acknowledgement of this strategies is that they are the only strategies considered to become the solution of the problem of depletion of the medicinal species.

2.7 Conclusions

From the different source, medicinal plants indicate to have great role they play and affected by many challenges that lead to their extinction and depletion . many government institutions and non-governmental institutions indicate to have struggled with policies, laws and regulations to fight against the depletion challenge the IMP is facing. Solutions to curb and minimise the challenges from different institutions were indicated although many of them indicate to have failed. Many government institutions had indicated to have failed to solve the problem as a result of having weak policies, laws and regulation.

2.8. Research questions

2.8.1. What are the challenges faced by local communities in utilizing and sustaining the Indigenous medicinal plants?

2.8.2. What should be the role of the local people in sustaining their environmental resources?

2.8.3. Which strategies should be applied for utilizing and sustaining the Indigenous medicinal plants?

2.8.4. Are there any intergovernmental policies in place which regulate overharvesting of medicinal plants?

2.8.5. What are the main factors contributing to overharvesting of the medicinal plants?

2.8.6. Do the Indigenous medicinal plants play an important role in the health of the local people?

2.8.7. Do the Indigenous medicinal plants have a role in cultural activities of the local people?

2.8.8. Are there any roles played by Indigenous medicinal plants in alleviating poverty within the communities?

2.8.9. What strategies can be implemented in order to minimize the threats imposed on the Indigenous medicinal plants?

CHAPTER 3: RESEARCH METHODOLOGY

3.1. Introduction

This chapter covers aspects such as research design, which constituted by pilot survey, survey method, semi-structured interviews and population. It again deals with the issues such as area of study, sampling methods, choice of instrument, data collection methods and procedure as well as delimitations or limitations.

Research methodology is the pattern and style in which the research was going to be handled or conducted. It is also regarded as the philosophy of the research process. In this study, the researcher had used qualitative and quantitative methodologies or approaches as relevant approaches because the study involves the survey and analysis as part of research design. Babbie and Mouton (2001) cited that, research methodology, were the methods, techniques and procedures that were employed in the process of implementing the research design or assumptions that underlined the use. The main intention of this research methodology was to present, explain and outline the methods used to collect data for this study.

3.2. Research design

The research designs describe the procedures for conducting the study, including the time, the subject and under what conditions the data was to be conducted. De Vos et al (2002) indicated that, research design indicates how the research is set up, what happened to the subjects and what methods of data collection are used / employed. Research design refers to the plan and structure of the investigation used to obtain evidence to answer research questions (White, 2002). Babbie and Mouton (2001) indicated that, research design is a plan or structured framework of how a person intends to do the research process in order to solve the research problem.

The survey research design as a type of data collection technique has been used in order to get the expected information by the researcher. The survey research design is more relevant to this kind of investigation because instruments that are mainly based on the qualitative and quantitative approaches have been prepared and administered by the researcher in order to obtain valuable information about the local community's view on sustainability and utilization of the plants.

According to White (2002) who said ``research design referred to the plan and structure of the investigation used to obtain evidence to answer research questions`` The design described the procedures for conducting the study, including when, from whom and under what conditions the data was to be obtained (White:2002)

Field work or observation as an instrument of gathering data was conducted to verify the views of the local people towards IMP. When collecting the data, the researcher was focusing on perceptions, values and challenges that were faced by the indigenous medicinal plants (IMP). The study focused on the elders and youth in the study area. In the former, elders seemed to have indigenous knowledge (IK) that assisted them in the preservation and sustainability of (IMP). In the later, the youth seemed to lack the IK about IMP and as a result the lack of such knowledge led them to harvesting the species in an unsustainable manner that could lead to the depletion of the IMP.

As elders seemed to be illiterate, the researchers administered a semi-structured interview in order to probe into more information from the elders. On this fact Grinnel (1998) indicated that, the semi-structured interview schedule would include some specific items, but considerable latitude was given to the research question being studied. Apart from the semi-structured interviews, the researcher also administered questionnaires on youth because they seemed to be literate and could not understand and interpret questionnaires.

3.1.1. Pilot survey

The pilot survey was conducted as a preparatory stage for the survey itself. It was conducted in order to identify the problems that the researchers could experience during the interviews or time for data collecting. Before conducting the pilot survey, the researcher first requested permission from the chief and the headman .After being given permission, to go ahead the researcher constructed questionnaires for pilot survey which was done between the elders and the youth as a study of the population. The researcher made that pilot survey in order to rectify the errors that could be encountered in the investigation and other problems that could be identified.

Vermeuleun (1998) indicated that, it is essential that newly constructed questionnaires, i.e. in their semi-final form, be thoroughly pilot –tested before being utilized in the main investigation. This

indicates that the pilot survey, minimized the problems which the researcher could probably have experienced in interviewing the participants during the data collection. When conducting survey the researcher managed to identify problems such as those of clarifying some questions especially to the elders. Problems experienced among the youth were mainly those of lack of sufficient knowledge.

3.1.2. Survey method

The researcher used the survey method in his study as it embraced interviews to be conducted in the study area. With regard to survey, Garbers (1996) indicated that, surveys have the following characteristics:

- They accommodate any research goal, but are usually descriptive or explanatory, they are usually representatives, they are either longitudinal or cross sectional and are usually independent of a context (groups were statistically composed by means of sampling).

3.1.3. Semi-structured interviews

Semi-structured interviews had an advantage of giving the researcher and the participants much more role of flexibility unlike other types of interviews. The researcher is able to follow up particular interesting avenues that emerged in the interview, and the participant able to give a fuller picture. Grinnel (1998,) indicated that, the semi-structured interview schedule could include specific items, but considerable latitude was given to interviewers to explore in their own way matters pertaining to the research question that were studied. De Vos et al (2002) indicated that, semi-structured interviews however are especially suitable where one is particularly interested in complexity or process, or where an issue is controversial or personal. The Semi-structured interviews with the characteristics of flexibility, is suitable and mostly used to probe sensitive information from the participants though it does not mean to divert from the real formulated questions by the interviewers.

In this study, the interview schedule constituted of semi-structured questions to enable the researcher to probe so that more information could be obtained about the perception or attitude regarding IMP. Again are semi-structured interview was prepared as a way to create the flexibility

and conducive environment to the researcher and the participants. Areas in which the IMP was found in great numbers were identified in order to get more information and problems regarding the perception, attitude and utilization of these plants.

3.1.4. Population

The Population of a research is the instrumental tool which the researcher used to collect data and could be individuals, elements, plants etc. The population of research is the collection of objects, events or individuals, who have common characteristics that the researcher is interested in studying (Mountain as cited in Vermeulen,(1998). Again Vermeuleun (1998) indicated that, a population is considered to be the sum total of all the cases that meet the definition of the unit of analysis. Bless & Higson- Smith (2005) indicated that, the unit of analysis was the person or object from whom the social researcher may collect data. This indicates that, the population of a research was those sentiments from whom the researcher got the information concerning his/her study. Babie and Mouton (2001) indicated that, a population was the theoretically specified aggregation or the elements.

The units of analysis in this study were elders and youth in the Thengwe area. Special attention was given to the elders because they seemed to have valuable information and knowledge about the medicinal plants.

Table : 1 on page 30 indicates the population study in this research.

3.2. Area of study

The study was conducted at the Thengwe Village which was an area situated in the north of the Limpopo Province in the Mutale Municipality in the Vhembe District. The area is about 30km from Thohoyandou. It is a rural area composed mostly of the poor disadvantaged families, who depended solely on their environment for their health, economy, dietary requirement, and shelter and other things.

The area of Thengwe is semi-arid leading people living therein to practise subsistence farming. Crops which are grown in the area are mostly watermelon, millet, Sorghum and others. Todd et al

in Lawes et al (2004) asserted that, subsistence farming in the Thengwe area is the primary activity, where semi arid crops, sorghum, millet and watermelon are chiefly grown and domestic livestock (cattle, donkeys, goats and chickens) were kept. The area received rain between September and April only. In order to support their families every way in dietary, economy, health, security, shelter etc, people of this area depend on the use of the indigenous trees and medicinal plants found within their environment.

The study area, in which the research has been conducted, is under the leadership of Chief Nethengwe. The sub-areas within this village are dominated by the one group known as Vhatavhatsindi (vhangona), which is a name derived from the *Brackenridgia Zanguebarica* (Mutavhatsindi) indigenous medicinal plant which is found only at this place in South Africa.(Thengwe). The area was chosen as a study area because it has high rate of indigenous medicinal plants grown than in any other areas of the Vhembe district. The fact that the area is semi-arid and characterized by dry hot climate in summer, the medicinal plants found in this area, are believed to be very powerful and as such people flock in large numbers to harvest them. As the area and its sub-areas are far from towns and are not easily accessible to better health service, the communities resort to help themselves by using medicinal plants found in this village for their health and survival.

3.3. Sampling methods

Sampling methods were the techniques that the researcher used to select the respondents for data collection. This was the way in which that the researcher used to get individuals who have the information of the study. De vos, Strydom, Fouche` & Delport (2002) define a sample as a small portion of the total set of objects, and events with persons who together comprise the subject of our study. White (2002) defined the sample as a group of subjects or situations selected from a larger population. This means that sampling methods that the researcher used to select the small portion of the total set of population that could be enable to give the relevant information needed for the study.

3.3.1. Purposive sampling

The researcher used purposive/ judgmental sampling to select elders, Chiefs, Headmen, and the traditional healers who had the indigenous knowledge (IK) with regard to the medicinal plants in all areas of the Thengwe Village.

| Category | Population | Sample |
|---------------------|------------|--------|
| Elders | 50 | 50 |
| Chiefs | 1 | 1 |
| Headmen | 6 | 6 |
| Traditional healers | 15 | 15 |

Table : 1 Reflection of population and samples of some respondents

The researcher interviewed people of the above sectors as they seemed to be the participants who had the best IK about the MP and that was done in order to fulfill the individual judgment of the researcher hence the purposive sampling. This was also done because the researcher had knowledge and background of the research problem and by so doing, the researcher had a purposive aim he wanted to achieve. The purposive sampling was used to elders, chiefs, headmen and traditional healers because these respondents have the same characteristics. White (2002) indicated that purposive sampling was based entirely on the judgement of the researcher, in that a sample was composed of elements which contain the most characteristics, representative or typical attributes of the population.

Grinnel (1988) indicated that, we can only use purposive sampling when we had sufficient knowledge related to the research problem to allow selection of typical person for inclusion in the sample. Bless & Higson-Smith (2005) indicated that, purposive sampling method is based on the

judgment of the researcher regarding the characteristic of a representative sample. With regard to the above two views it meant that, the researcher only selected or chose purposefully the subjects which could provide the relevant information for his/her study. When concurred with the above ideas, Singleton as cited in De Vos et al (2002) indicated that, purposive sampling is based entirely on the judgment of the researcher, in that it is composed of element that contain the most characteristic, representative or typical attributes of the population. The judgment of the individual research was obviously too prominent a factor in that type of sample. Babie and Mouton (2001) cited that, judgmental sample is a type of non-probability sample in which one selects especially the units to be observed on the basis of ones own judgment about which ones will be the most useful or representative.

3.2.2. Snow ball sampling

As a result of the sensitivity of some important information needed for this study and has been realized to be difficult to get during a pilot survey, the researcher decided also to use the snowball sampling technique to interview those subjects who had valuable information. In order to get the information the researcher interviewed the elders like traditional healers, herbalist and others who in turn were asked to suggest other respondents who were considered to hold valuable information about the IMP so that the researcher could make an arrangement to interview them at his convenient time.

The researcher firstly approached a few individuals from the population who then, after they had been interviewed were requested to mention the names of any other individual who could assist in giving the required information. Snowballing involved approaching a single case that was involved in the phenomenon to be investigated, to gain information on other similar persons (Vermeulen, 1998). In turn that person is again requested to identify any other people who might make up the sample (Vermeulen, 1998). In concurring with the above views Welman & Kruger (2002) indicated that in snowball sampling individuals acted as informants and identified other members (for example Acquaintances or friends) from the same population for inclusion in the sample. Babie (2001) indicated that, snowball sampling had a particular application value in research since it is directed at the identification of hard – to research individuals. In the snowball sampling the researcher collected data from the few members of the target population he could locate, then

seeks information from those individuals that enable him to locate other members of that population (Babie, 2001). That shows that snowball sampling is important as it enables the researcher to dig out the information from the impossible participants who, if others sampling techniques have been used no result would have been attained.

Babie and Mouton (2001) indicated that, snowball is the process of accumulation as each located subject suggests other subjects. They (2001) further indicated that, snowball sampling might ask one of the participants who he or she believed to be the most influential members of the group. You might interview those people and, in the course of the interviews, ask who they believe to be the most influential person. During this process the most valuable information unfolded from one participant to another.

3.2.3. Random sampling

In order to collect his data in a fair and unbiased manner the researcher used the random sampling method. The purpose of using random sampling is preferred in this case as it gives every respondent an equal opportunity to participate and being selected as a subject.

Vermeuleun (1998) indicated that, random sampling was that method of drawing a portion – or sample – of a population so that each subject had an equal chance of being selected, or random sampling was that method of drawing a sample of population so that all possible samples of fixed size had the same probability of being selected. In concurring, with the above idea, White (2002) stated that, random sampling was that method of drawing a portion so that each member of the population has an equal chance of being selected.

3.3. Choice of instrument

The researcher used one type of instrument when collecting data i.e.: the interview schedule from the elders, chiefs, headmen, traditional healers and a youth group.

3.4. Data collection methods and procedure

Data collection methods and procedure, refers to the techniques that the researcher used to get information from the respondents. It required the researcher to get information from respondents using interviews, questionnaires or both.

The data was conducted in two stages. In the first stage the researcher identified different community areas under Thengwe and conducted semi-structured interviews. Questions were based on the elder's general knowledge of IMP and their uses.

The second stage involved interviewing all subjects. The main idea was to gather the perception of the youth and elderly people on sustainable and utilization of the IMP. The topic or issue considered in the interview included the uses: economic values, cultural values, aesthetical use and religious beliefs. The uses, economic values, cultural values, taboos that these IMP are attached to; determine the perception of the community towards them. During the collection of data individuals were positively indicating concern in the uses and sustainability of the medicinal plants.

3.5. Delimitations/ Limitations

This study confines itself to the study of the indigenous medicinal plants which are found in the Thengwe area. The study will only look at the challenges facing local communities in utilizing and sustaining indigenous medicinal plants and ways in which they can be used to minimize the depletion of species. The findings of the study will be generalized with other findings which have been studied from other areas which also have indigenous medicinal plants (IMP).

CHAPTER 4 DATA ANALYSIS AND INTERPRETATION

4.1. INTRODUCTION

This chapter deals with the analysis and interpretation of data obtained through interviews and field survey. The purpose of this chapter is to present the information about the local people's perception on indigenous medicinal plants. The data has been interpreted and illustrated through the use of graphs, pie charts and pictures.

4.2. Personal information

4.2. 1. Respondent from various age groups

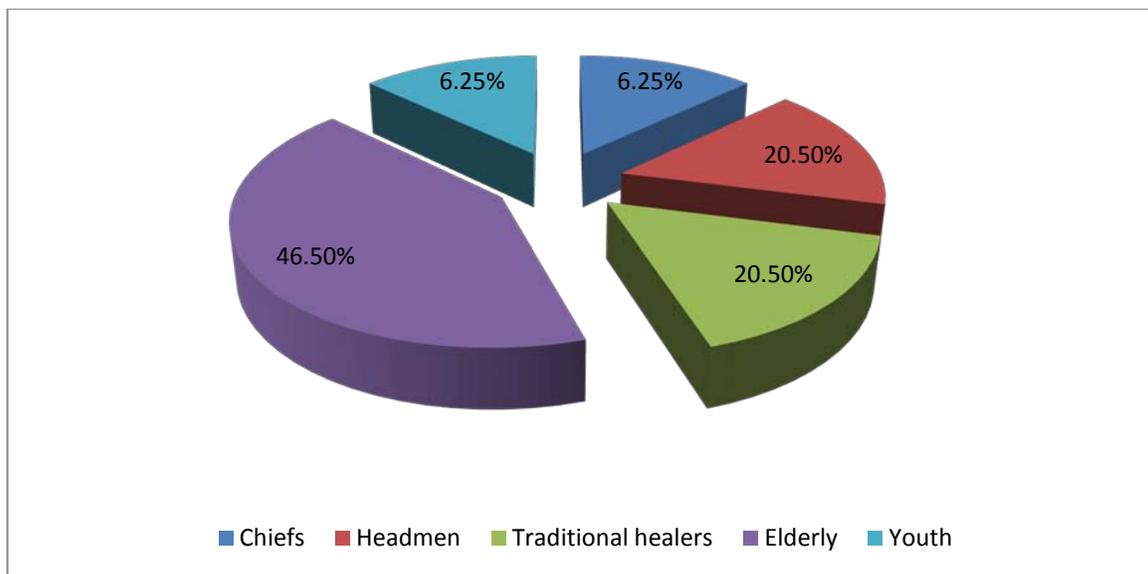


Figure: 3 Percentage of what has been contributed by various participants

Data was collected among the elderly, traditional healers, headmen, chiefs and youth groups who contributed 46,5%,20,5%,6,25% ,20,5%,6,25% respectively. Figure: 3, showed a different percentage of responses from each group which seemed to be influenced by factors such as experience, in-experiences and minority. Groups which have experience in life and are familiar with IMP use responded in larger numbers. Including the traditional healers, headmen, chiefs and the elderly group form the highest percentage of the respondents which are 93, 32% whereas the youth group forms the smallest/lowest percentage of 6, 25%.

All the groups that form part of the elderly group responded positively because of the in-depth knowledge they have in LMP. This group has a wide knowledge because they use the indigenous medicinal plants in their daily activities. The later group contributed a very small percentage due to the fact that they were inexperienced in life issues and also influenced by their religion.

4.3. Local people's perception and an account of indigenous medicinal plants.

4.3.1. The relationship between the age and the indigenous knowledge about the medicinal plants and culture

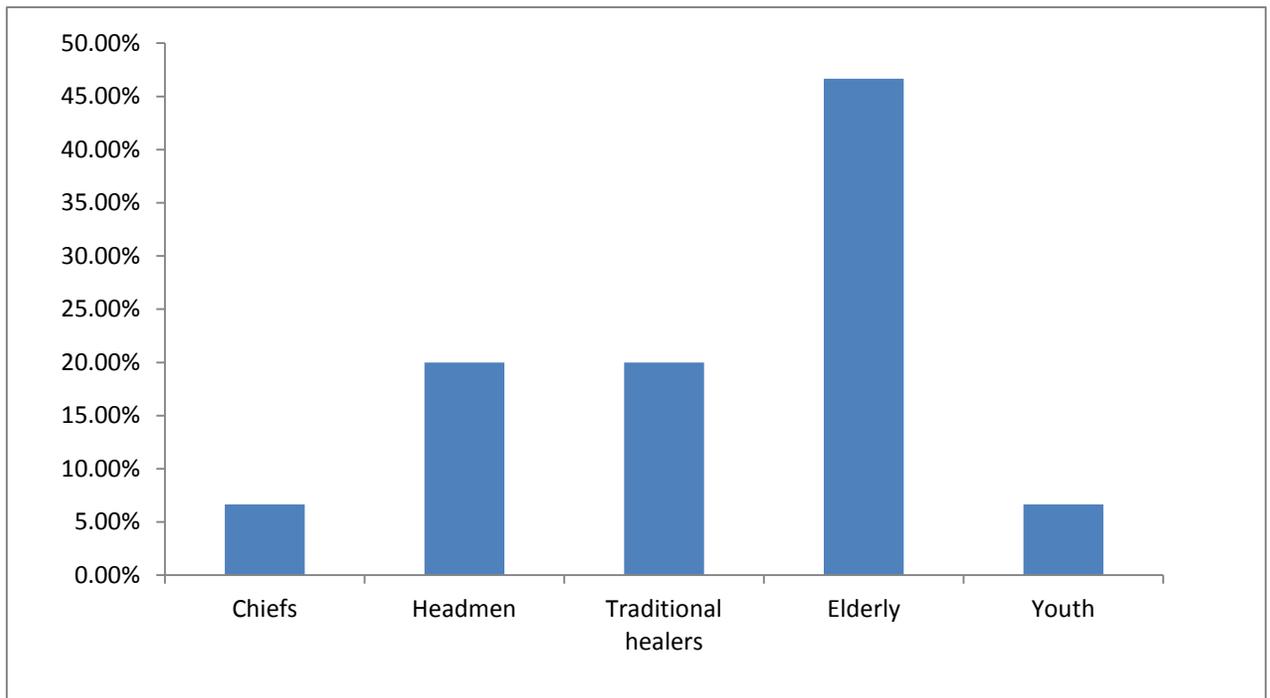


Figure 4: Participants of various groups in relation to indigenous Knowledge Systems (IKS)

From figure 4 there is a great relationship between the ages and the knowledge the people have with regard to the IMP. The experiences which people have determine the individual's group on how they utilize the medicinal plants towards their sustainability. The highest percentage (93, 3%) of the contribution comes from the older generation who indicated to have more knowledge of the indigenous medical plants. The percentage includes the ordinary elderly people, traditional healers, the chief and the headmen. The ordinary elderly people showed in-depth knowledge when they were responding to the questionnaires due to their age and experience in life they have acquired as they have lived up to now. They also indicated that, indigenous medicinal plants unlike other

ordinary plants are very important and are used almost every day in life. From their experience they even indicated that some of these medicinal plants were once used as staple food during hard and war times and as a result they still think highly of their IMP. Many of these elderly people indicated the most important function of the medicinal plants as the ones that heal different diseases that threaten the lives of many people.

The Chief and the headman as traditional leaders indicated to have acquired knowledge of IMP through their fore-fathers who ruled before them. They indicated that, they were told that the IMP is very important if they could use them to make their reign last long and would be respected by their subjects. Again they showed to have acquired knowledge from their own people especially the traditional healers whom they usually consulted when they had problems regarding governance. The traditional healers have learnt that their governance still exists today because of the IMP which after they had used everything became good and orderly in their areas. They have shown that their areas and family houses were and still protected from evil spirits and enemies by using IMP. As a result of this knowledge, the traditional leaders perceived IMP as important plants and as plants that should be respected and given sufficient care and protection they deserve as their depletion could cause a serious problem in their lives.

As traditional healers and people who work with the IMP every day of their lives, they had shown a great depth of knowledge in these species than other groups. Traditional healers indicated to have a good knowledge of these species from their colleagues who had long been in the field before them. They again indicated to have access to the information from the living deeds (ancestors) who inspired them with knowledge while in sleep (were and especially) in dreams. Through the knowledge they acquired from these two sources coupled with their experiences, the traditional healers perceived the IMP differently from other groups. To them the IMP were regarded as sustainers of their lives and generation of income. From the youth medicinal plants are perceived as plants which have important value among other biodiversity resources. When regarding them as plants that can be considered important when they are used as medicine in people's lives, they were regarded as important plants that played a pivotal role in their daily lives. Medicinal plants in this area are playing a pivotal role in the study of many students' researchers of the University of Venda and of the University of the Limpopo. To the unemployed, the medicinal plants are

considered as a source of income when commercially gathered and sold to the traditional healers outside the study area.

4.4. The importance of IMP

The respondents in this study indicated that the medical plants in their area are mostly regarded important in the following areas shown by figure 5 below in which are economic, social, religious, and aesthetic or environmental.

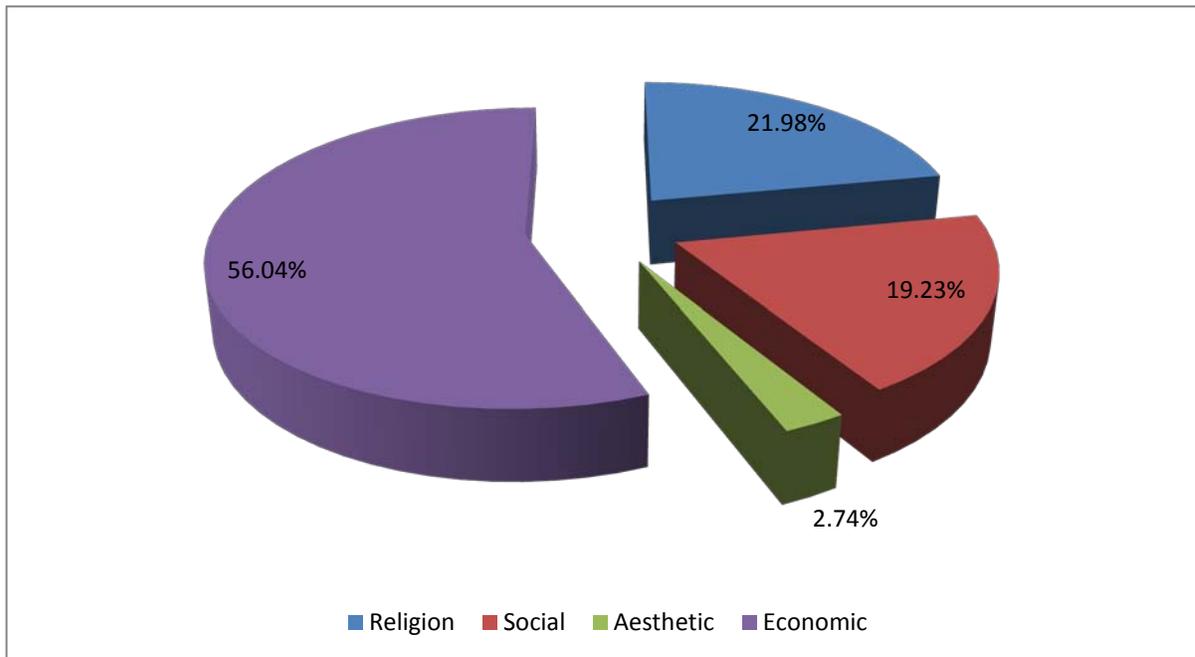


Figure 5: Factors contributing towards the exploitation of Indigenous Medicinal Plants (IMP)

4.4.1. Medicinal plants as human and domestic animal's medicines.

Figure: 5 shows that 56,04% of the respondent who are the chiefs, headmen, youth, traditional healers and elderly indicate that the IMP are mostly used for economic benefits. IMPS are mostly used to improve the quality of life of the local committees. Communities save their economic expenditure by using their IMP to treat most of the diseases that affect different ages of their people instead of using the more expensive Western medicines. From the respondent's contribution, local communities benefit from IMP, when they use them for treating infants diseases and those diseases that affect people of the middle age and elderly people especially those diseases that affect sexual organs. The medicinal plants mostly used to treat infants disease are

the Boobab (*Adonsonia digitata*), *Scalerocaya birrea* (*Mufula*) , *Clematis Brachiata* (*Tshiumbeumbe*) (Mabogo, 1990). These species are used to treat diseases such as stomachache, measles, internal sores, and maintaining good health etc. the barks *ssclerocarya birrea* (*Mufula*) are boiled and used to treat the internal sores. The roots of the *Adosenia digitata* (*Muvhuyu*) with the root of other species are soaked in water and used to cook soft porridge for maintaining good health of an infant , while the *clematis branchiate* is soaked in water for bathing and treating infants suffering from measles.

Elderly people also use these medicinal plants in their everyday lives. They use the species especially when they treat diseases such as cancer, influenza, stomachache, toothache, diabetes, external sores, high blood pressure and other diseases related to sexual organs. Species such as *Clematis Brachiata* (*Tshiumbeumbe*) are primarily used for the treatment of influenza. *Ziziphus mucronat* (*mukhalu*) is especially used when it is mixed with other medicines to treat cancer.

The people of Thengwe use the medicinal plants also to improve the health of their domestic animals including fowls. As part of their economic benefit, people use the juice of the *Aloe Vera* (*Tshikhopha*) to treat the external sores and any dangerous diseases of fowls. Communities indicated that the demand of medicinal plants of medicine to human and domestic animals became a contributing factor towards the depletion of medicinal plants.

The use of medicinal plants in human and domestic animals is considered to be common among community members of the Thengwe village and are regarded as factor putting pressure to the species. Many medicinal plants harvested in bulk for medicinal purpose within the village and outside the area. It has been realized that within the Mutavhatsindi nature reserve (MNR) and outside bucks and roots of medicinal plants to be used for medication.

The use of medicinal plants as; curing medicines considered to be important within different communities especially the indigenous communities. Indigenous communities turn to have trust in IMP than in western medicines this is an acknowledgement by Nickel and Sennhauser(1995) when saying that more than 80 percent of the people in South Asia rely on herbal remedies as a principal means of preventing and curing illnesses, and several traditional medicinal systems are based on the medicinal plants.

4.4.2. Local people`s views on indigenous medicinal plants

The respondents perceive indigenous medicinal plants as valuable environmental resources to their lives. Most of the elderly people who have the indigenous knowledge of medicinal plant showed great trust in them.

They view the medicinal plant as an important resource which played and still plays an important role in their cultural lives. The local communities` views are mostly based on what the indigenous medicinal plants are used for; like in issues such as economic, social, aesthetic, and religious. Again the attitudes of these communities towards the medicinal plants impact the species in a different way either positive or negative.

The Thengwe community members valued medicinal plants as important to their lives and as part of their culture. Medicinal plants are regarded to be the best medicines for Africans and African diseases which are incurable by the Western medicines. Based on the indigenous knowledge they have, the community members viewed the medicinal plants as the source of their economic life and other areas of their lives. The perceptions of indigenous medicinal plants in this way is considered to be imposing a serious threat to the species which lead to the depletion of species.

In the Thengwe area the fact that the communities in the area know well about their environmental resources, they have a positive attitude and perception towards the IMP found in the area. In this way the indigenous people seem to rely on IMP as the only medicines that have power to heal serious diseases. Grieson and Afolayan (1999) say that, although many rural communities now have access to mobile clinics and hospitals, there is still, to a larger extent, a belief in herbal distrust of anything Western.

4.4.3. Medicinal plants, poverty alleviating factor in the Thengwe area

The IMP found in the Thengwe area play a great role of creating employment to the unemployed community members. Young and elderly community members responded that, many community members gather and poach medicinal plants for commercial purposes. It has been indicated that many of the medicinal plants in this area are sold in many towns and cities within South Africa. Among other medicinal plants harvested in bulk are *Brakenridgea Zangubanica* , *Pleusostylia*

capensis (*Murumelela*) *Hellria lucida* (*Mpeta*) and *Securidaca longependunculata* (*Mpeta*) because they are the most important medical plants and are in great demand. Some elderly people are believed to be supporting their families and, manage to send their children to school from the money obtained from the sale of such plants for tertiary education. It was also indicated that among these commercial gatherers of medicinal plants most of them especially the youth, do not have the indigenous medicinal knowledge as main factor leading to the species depletion.

The Traditional healers also indicated that the availability of the medicinal plants in the area is also boosting them economically. In their response, traditional healers indicated that from the income they receive they are also able to employ other people to assist them in their work. They indicated that the area where these medicinal plants also grow contribute to their business as growing in a hot condition which makes them more effective in healing. The condition where the IMP grow is also considered to be a factor influencing the overharvesting of the species because they stronger than those that grows in rainy area. Medicinal plants seem to be alleviating poverty in many families due to their job creating potential.

Indigenous medicinal plants as part of the Thengwe environmental resources area are considered to be part of the community's culture because of the role they play in the community. In this area, the medicinal plants are used to perform many religious cultural activities among the community members. It is believed from the respondents that, the medicinal plants such as *Brakenridgea Zanguebarica* and *pleurostyliia capensis* (*Murumelela*) performed great magical cultural activities within the community members. The *Brakenrdgea Zanguebarica* is believed that,when its roots have been ground and used with other medicinal plants, protect the home and people against witches and evil spirit. Besides being used to protect, it is also used to perform magic in the community. The use of IMP in cultural value acknowledged by only 19,2% of the respondents contribution in the study area. The use of medicinal plants in this way created a serious multi-trade business in the area which employed many unemployed youth and elderly herb collectors.

Halleria Lucida (*Mpeta*) is commonly believed to be used by women especially those who brew African beer to make a spoon for cooking food or stirring African beer so that anyone who eats the food from that spoon will become weak and keep away from troubles within the premises where the spoon has been used. In the case of the African beer people who drink the beer that has been stirred with the spoon from this medicinal plants, they become weak and drink beer peacefully

without fighting and by so doing the business flourishes and generate a lot of money to the owner of the beer. Because of this magical culture performed by these plants, many challenges in overharvesting lead to depletion of medicinal plants.

From the community`s view point, it is difficult to sustain the indigenous medicinal plants as they are used to alleviate poverty within the community members. The fact that, medicinal plants are used to cure illnesses and generate income among poor people within the community members and increase the chance of depletion of the species through overharvesting when people want to feed themselves from the species and sustainability to medicinal plants becomes a challenge to the plants.

The indigenous plants will always be considered as medicinal source of high value in the rural communities. IMPs are not only used as medicines that used to heal sickness only but are considered as poverty alleviators in the sense that they generate revenue and create employment . Cunningham et al (1993) indicate that, one form of rural self employment is the collection of indigenous medicinal plants as a source of income.

4.4.4. Medicinal plants as part of Religious activity.

Rural communities regard the medicinal plants as part of their religion. About 21, 98% of the respondents` who are the chiefs, headmen, elderly people, traditional healers and youth contribution, indicated that medicinal plants found in the Thengwe area are also important and are used in some religious activities of the communities. Most of the people who responded to this aspect were elderly people who have more experience of the environmental resources.

It was indicated that the *Aloe Sessiliflora (Tshikhopha)* is applied in the field of communities to prevent the spoilage in the production especially of pumpkins. It is believed that when plant is grown in the field any plant diseases that could attack such type of crop cannot prevail.

Aloe Sessiliflora (Tshikhopha) together with *Bahumia Galpini (Bopha)* and others are also used to relief psychological problems within the family. It is believed that if someone has passed away in the family and buried, *the Aloe Sessiliflora (Tshikhopha)* and *Bahumi galpini (Bopha)* together with other species are soaked in cold water and the mixture applied on the hands and feet of the bereaved members of the family and relatives of the deceased so that they forget about the

deceased. Although the use of these medicinal plants in this fashion is not well known to the youth it poses some threats to the species because they are overharvested.

When people hold their religious ceremonials the medicinal plants are mostly involved in their activities. As a result of the involvement of these plants in the activities they become valuable and important medicines that people can rely on for their lives. Cocks and Molles (2002) indicate the medicinal plant *Itshange* as medicine used by their Xhosa people to protect the infants from evil spirits or from getting them out.

4.4.5. Aesthetical use of IMP

About 2, 74% of the respondents views indigenous medicinal plants (IMP) as holding essential aesthetic value in the community. The respondents acknowledge that some of the medicinal plants attracted the tourist who visited the area who removed them to beautify their homes. This is becoming a great concern among the community members as the species are depleted in a way that their future generation will no longer have the species for use as has been the case all along. The use of medicinal plants in this way is not common to the community members in the area. The effect of aesthetical use is depleting and cause some species to become extinct as some of the species are uprooted when transplanted by community members and tourists.

Some community members acknowledge that medicinal plants have an important role in the environment as they play for beautifying the area. As environmental resources, the depletion of medicinal plants could have a serious impact in causing the global warming and the cause of heat in the villages. The species are important also for the exchange of gases with human beings during the day in the form of the process of photosynthesis and during the night in the form of nitrogen cycle. These processes are important for the life of all human beings and for the plants species.

4.5. Challenges encountered by communities in sustaining the IMP

The communities are facing a serious problem of sustaining the medicinal plants because of different challenges encountered from within and outside the village. Challenges such as political involvement, soil degradation and over harvesting of the species have already been mentioned.

4.5.1. Political involvement

The Thengwe community members indicated that the political ineffective involvement is a contributing factor towards the depletion and unsuitability of medicinal plants. The communication breakdown between the intergovernmental spheres also influence the overharvesting of medicinal plants. The intergovernmental spheres which are the National, Provincial and local governments have no strong regulation acts against the illegal medicinal collectors or poachers. The Acts, policies and regulations which are in place from National sphere of government are implemented and not in an effective way that can enable them to sustain medicinal plants.

The Limpopo Provincial Department of Economic, Development, Environment and Tourism had not listed the Mutavhatsindi nature reserve (MNR) as one of its nature reserves that could be regulated and controlled by the department (guidelines for the process of declaration of protected areas in South Africa, 2009). The local governments from the district and Mutale municipality where the nature reserve and the study area are found also have no regulations, by-law and policies that govern the utilization of the natural and environmental resources. The community also indicates that the illegal medicinal collectors who are prosecuted are charged at the Thohoyandou court magistrate court are not even given high penalties instead they are given light charges which do not discourage them from stopping their poaching.

The fact that the study area is not declared either as one of the Limpopo Nature Reserve or South Africa Nature Reserve leads the Mutavhatsindi nature reserve not considered as a Protected Area and not governed under the National Environmental Management: Protected Areas Act, 2003(Act no.57 of 2003). The Provincial Government and the National government with Local government are minimally involved because the study area was under the control of the former Bantustan homeland and has its own regulations which do not exist in the new democratic government. The declaration of the study area under the National Environmental Management: Protected Areas Act, 2003(Act no.57 of 2003) will involve the intergovernmental spheres together with the communities and relevant stakeholders to participate in order to involve area which could help the species and the study area preserved against degradation and depletion.

The co-operation between the intergovernmental structures and their department is important for the development or rehabilitation of the destroyed environment. The minimal involvement of the

intergovernmental spheres which is the national, provincial and municipality or local government in the prevention of the exploitation of medicinal plants in the study area is regarded as a serious problem. The national government and the provincial government had put in place the regulations and Acts to protect the scarce species and those facing extinction but because the local government does not have a fully fledged department that deals with the environment nothing is being done. The work policies and regulations of the national and provincial government are seen as contribution factors to the exploitation of the medicinal plants.

4.5.2 Soil degradation

It has been indicated that the communities also indicate that soil degradation in the area is creating a serious problem on the species. Thengwe is a semi-arid area and it is characterized by sandy soil. Respondents indicated that during heavy rain the top soil is eroded and leaves the roots of the species unprotected and being exposed to poachers and other things that can destroy them. It has been indicated that soil degradation is affecting the species in a negative way and causing many of them to be depleted and others completely disappear.



Figure: 6 Depletion of species causes soil degradation

4.5.3 Over harvesting as a threat to the species

It has been reported by the respondents that concern has been expressed to the relevant department and to the traditional leaders within the area that medicinal species are facing depletion because of overharvesting done by the commercial gatherers and poachers. When illegal harvesters prosecuted and brought to the relevant authorities with bulks of medicinal plants, the fines they received were so minimal that they didn't have any effect on the gatherers. The respondents indicated that the overharvesting is also influenced by the authorities especially the chief and the headman who is paid the fee allowance for medicinal collecting, and in turn do not limit to the collectors.

The weak policies and regulation within the three spheres of government considered as factors influencing the overharvesting of the species. The penalties given to those who trespass the regulations are considered ineffective and encouraged the collection of medicinal plants in bulk which results in the depletion of species.

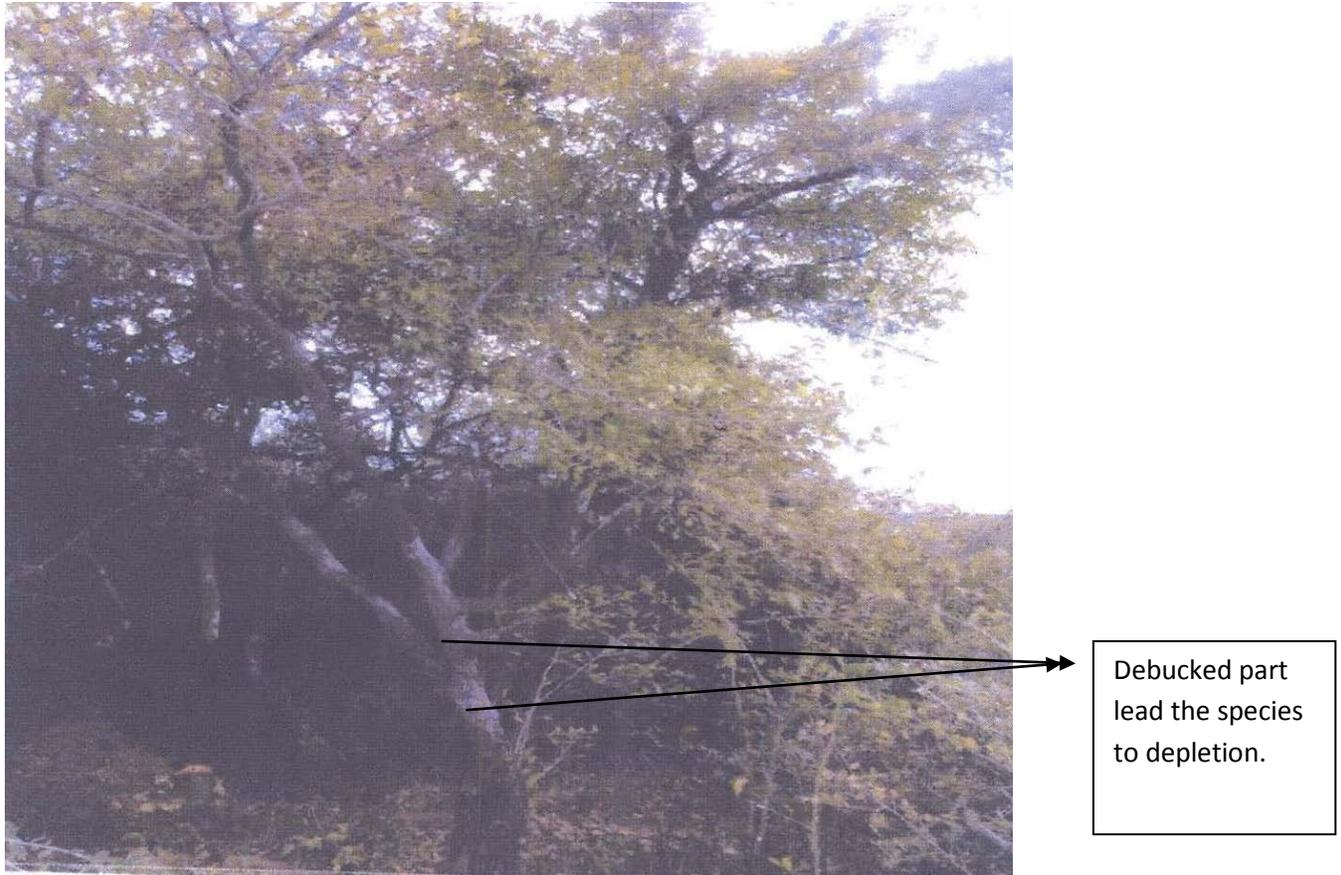


Figure 7 Overharvesting causes depletion of IMP

4.5.4. Strategies in an attempt to sustain the IMP

Communities indicated that many attempts had been made to sustain medicinal plants. The communities together with the South African Police Service agreed to patrol the area during the day to protect medicinal species against poachers. It has been indicated that since the agreement was in place, many poachers were prosecuted and fined by the Thohoyandou magistrate court. The poaching rate during the day seems to be more minimal than before this campaign by the community members and SAPS. The Department of Economic, Development, Environment and Tourism had placed their workers to guard the (Mutavhatsindi Nature Reserve) only during the day. The respondents indicated that poaching within the nature reserve occurs during the night and after sunset as the workers in the nature reserve work from morning to 16h30 and people staying around the nature reserve are no longer able to see persons far from a distance especially the

poachers. Although these strategies are working, it has been indicated that they do not reach the level of expectation they are expected by the communities hence there is still a room for more strategies that can deal with the problem more effectively than hitherto. It is hoped that some stern measures could be effected to combat this menace that has cause frustration in that part of South Africa. Many people in the Thengwe area look forward to the day the solution to this problem can be found.

The fact that the fence is not properly erected, a poacher finds it ease to enter the Mutavhatsindi Nature Reserve and harvest the medicinal species. The fewer amounts given to the poachers by the Thohoyandou magistrate court encourages the poaching which in turn nullifies the plan for other strategies

4.6 CONCLUSION

The problem of the depletion of IMP in the Thengwe area is realized to be influenced by many factors within the communities. The study area as a rural and semi desert influence the community to rely on the IMP as their source of healthy lives. Medicinal plants assist the poor communities in their livelihood as many members of the communities are not employed.

CHAPTER 5: Summary, RECOMMENDATIONS, IMPLICATIONS AND CONCLUSION

5.1 Summary

The community of Thengwe resides in a rural area where the modern health facilities are scarce. Both generations believed in using the indigenous medicinal plants as an alternative for modern health medicines. The data collection was conducted among the old and the young generations. The older generations gave maximum participation during the data collection. The information they gave with regard to the indigenous medicinal plants was based on the experience they had encountered in their everyday life. Traditional healers indicate the role of indigenous medicinal plants as that of improving the livelihood of both people and animals and as a job creating sector to the jobless. All generations indicated to be well vested with the knowledge of the indigenous medicinal plants.

The situation of Thengwe played a role in moulding the communities to depend on their environmental resources especially indigenous medicinal plants. The communities of this area perceived indigenous medicinal plants as their source of economic income. Those community members who have the indigenous knowledge (IK) of medicinal plants gathered them and sold them to traditional healers and other people who visited the area. Indigenous medicinal plants are perceived as something that create jobs to the unemployed community members. Old and young community members who are not employed but who have indigenous knowledge of medicinal plants are hired to collect medical species for traditional healers in return for money.

Indigenous medicinal plants are important for both human and animals lives in the area. The people of Thengwe used the indigenous medicinal plants for improving their health. The medicinal plants are used to cure those diseases that affect infants and those diseases that affect the young and the old people but who believed they cannot be treated with modern medicines. The medicinal plants are also used for the health of the domestic animals such as cattle, goats, chickens, dogs and donkeys. The community members used the aloe vera to cure diseases such as new castle in chickens and wounds among cattle, donkeys, goats and dogs.

The indigenous medicinal plants are improving the livelihood of many families in the area through the creation of jobs, generating income and provision of health. Many community members in the

area who do not work had created jobs for themselves through collecting medicinal plants materials and selling them to all traditional healers. As the area is inhabited by the most disadvantaged families who mostly their livelihood depend on child grant, the medicinal plants are mostly used to cure diseases that affect communities. Through using these medicinal plants, the poverty within the communities seemed to have been temporarily alleviated.

Aloe Sessiliflora (Tshikhopha) together with *Bahumie Galpini* (Bopha) and others are also used together to relief psychological problems within the affected families. A family and relatives of the deceased would be treated with them so that they forget about the deceased. Many indigenous medicinal plants are transplanted from the Thengwe area to other nearby areas to beautify those areas. Tourists and visitors who visited the area would buy some small indigenous medicinal plants taken from this area for aesthetical use.

There are many challenges that the communities of Thengwe are facing with regard to the sustainability and utilization of the indigenous medicinal plants. Political problems within inter-government considered to be the most challenge that influence the depletion and extinction of the medicinal plants and others. The lack of inter-governmental relation regarded to be letting the communities fail to protect the medicinal plants as there are no involvements of these three governments in the area to protect the medicinal species. As a result of lack of inter-governmental relations, the medicinal species are depleted and facing extinction because of over-harvesting.

5.2. Recommendations

5.2.1 Specific recommendations

Medicinal plants are playing a pivotal role in improving the health (lives) of the community members and as a result such campaign should be conducted in all communities to emphasize the importance of preserving the indigenous medicinal plants and to develop positive attitudes of using them in a sustainable way for future generations. These could be done by visiting the Headmen of all villages and ask for permission to conduct workshops during the traditional gathering and even other organizational gathering.

As a result that community members are using medicinal plants as source of economic income which is a great influencing factor for the depletion of species, it is important for the legal

authorities to be empowered to prosecute all people who are found illegally in possession of endangered and protected indigenous medicinal plants. This should include the charging of high fines to the illegal medicinal plants collectors and poachers by the magistrate court and traditional leaders.

Cultural and religious activities are practiced among the Thengwe community members and influence the depletion of species. In order to prevent such depletion and overharvest, security guards, should be employed to guard all villages where the endangered medicinal plants grow including MNR(mutavhatsindi Nature Reserve) to avoid the extinction of the species.

As there are many family medicinal species inside the Mutavhatsindi Nature Reserve (MNR), the nature reserve should be declared as a protected area in order that the harvest of any medicinal species within the area without permission should be regarded as illegal and all species within the area considered the protected species. These will enhance the protection and sustainability of the medicinal species.

The Mutavhatsindi Nature Reserve(MNR) should be declared a nature reserve in order to be governed by the National Environmental Management : Protected Areas Act (Act no.57:2003) so that the illegal medicines collectors and poachers can be prosecuted and fined according to the fines charged people who are illegally found in that protected endangered species. This is because poachers and medicinal plants collectors are encouraged to harvest medicinal species by the weak and less regulations and fines imposed on them when they are found guilty.

The students from the University of Venda , Limpopo and other universities consider the Thengwe area and Mutavhatsindi Nature Reserve as an important area for biodiversity researchers. For this reason, educators at schools should also indicate consequences of the depletion of indigenous medicinal plants and also emphasize the reason for preserving the endangered plant species. Environmental education should be offered to all community members to teach those who do not believe in the use of indigenous medicinal plants in treating their illness especially the Christian to have good perceptions towards these species. This could be done also by visiting different Christian churches and giving lectures on the importance of indigenous medicinal plants and others in general.

5.2.2 General recommendations

Whistle blowing should be encouraged within the community members against the illegal indigenous medicinal plants collectors and poachers to protect them from the harvesters who might intend to do so during the night when the workers have already knock off as they do at 16h30.

Strong fencing should be erected around the Nature reserve to prevent the poachers from getting into the area through a fence could be one of the contributing factors that directly allow the poachers from entering in with ease and harvest medicinal plant in an unsustainable way that may lead the species to depletion and extinction.

This could happen only when the vicinity of the study area declared a nature reserve so that it could be maintained by the Provincial Department of Economic, Development, Environment and Tourism. National curriculum statement should incorporate Environmental education and educators should be assigned to take responsibilities for that part in every school in the province and the country as a whole in general education and training band and further education and training band to minimize the overharvesting and the depletion of these valuable species.

5.3. IMPLICATIONS OF RECOMMENDATIONS

The declaration of the Mutavhatsindi Nature Reserve as one of the Limpopo Nature Reserve makes it governable by the National Environmental Management: Protected Areas Act, 2003(Act No: 57 of 2003)to be listed as a nature reserve advantaged as a study area as the government protects it and enables it to remain the area of paramount importance to the world at large.

When the study area was declared a nature reserve, it became a protected area and the process of declaring the area nature reserve involves the community participation which invites all stakeholders to become stewards of the species and protect them against the poachers and commercial gatherers and other people who might attempt to destroy the species.

When the study area has been declared a nature reserve and the species within the area declared protected species, the legal authorities are empowered by the Protected Areas Act to prosecute and give change to the illegal collectors. This helps the legal and traditional authorities to charge high fines to the illegal medicinal collectors who are encouraged to trespass in order to poach the species. The present situation of not being listed among the Limpopo Nature Reserve exposes the

species to illegal collectors because when prosecuted, the legal authorities find it become difficult to charge the poaches as they find themselves having no valid reasons argument.

Campaigns to be conducted in emphasizing the importance of conserving the Indigenous medicinal plants and to develop positive attitudes towards the utilization and sustainability of Indigenous medicinal plants will be difficult for the government and department because of engaging in this project will need more money and human resources to protect the place.

The use of the existing educators at schools to teach about the importance of medicinal plants and their sustainability would cost no money to the government as the budget for the existing educators is already in place. It will be a great challenge for the Department of Environmental Affairs and Tourism to engage themselves in the department of education to include the environmental education especially of indigenous medicinal plants in the present National Curriculum Statement (NCS).

Erection of a strong fence around the area would be a very good solution to stop the poachers from getting to the reserve and harvesting the species. Although the erection of the fence could benefit all the stakeholders and the species at large, it will be a great challenge to the department because more money will be needed to erect a strong fence.

5.4. CONCLUSIONS

Thengwe village is mostly characterized by poor and disadvantaged African groups whose cultures are attached to their environmental resources especially plant medicinal species. As disadvantaged groups, they rely on their indigenous medicinal plants for their health. Although the indigenous people are considered to have indigenous knowledge of their indigenous species of trees which can assist to save the species from depletion, with regard to the Thengwe communities' medicinal plants are depleted as a result of unsustainable use by commercial gatherers.

This study has brought to light challenges facing the local communities in utilizing and sustaining the indigenous medicinal plants. It also shows the different factors that contribute towards these challenges and the consequences brought about by these factors. In the discussion, the study indicates and encourages the cooperation between the intergovernmental spheres as a solution to minimizing the depletion of medicinal plants. The Department of Education and Environmental Affairs and tourism co-operate with a view to protecting the indigenous medicinal species. The

Department of Environmental Affairs and Tourism should emphasize the importance of medicinal plants in a formal and non-formal way in order to change the attitude of the community members towards the utilization and sustainability of medicinal plants.

The Department of Environmental Affairs and Tourism as main and most affected stakeholder should be involved in the awareness campaigns, stressing the importance of preserving the environmental resources and indigenous plants especially those with medicinal properties. The Department of Education on the other hand should emphasize the importance of the medicinal species to the health of the people and the importance of these species in education and resources of higher education.

The study also indicates the importance of medicinal plants in the local economy as their sustainability could attract the tourist to visit the study area. There is an indication revealed in this study, that in the future, some of the endangered and scarce medicinal species within the study area will be depleted and face extinction if people continue to overharvest these important species.

REFERENCES

- Babbie, E. 2001. The Practice of Social Research: 9th edition. Belmont: Wadsworth
- Babbie E. & Mouton J. 2001. The Practice of Social Research Belmont: Wadsworth
- Bentley, C. 2001. Environmental management Science. Britain: Library cataloging
- Berger, J.J. 1990. Environmental Restoration, science and strategies for restoring the earth. USA: Library of congress cataloging.
- Bodeker, G.C. 2005. "Global initiative for traditional systems (GIFTS) of health". [o] Available: <http://www.fao.org/docrep/w7261e/w7261e03.htm> :Accessed on 11/22/2005
- Bless C & Higson-Smith, C. 2005. Fundamentals of Social Research Methods: An African Perspective, 2nd Edition: Cape Town: Juta & Co.
- Brueng E.F. 1998. Conservation and Management of Tropical Rainforests: An Intergrated Approach to Sustainability: U.K. Cambridge University Press.
- Cocks, M & Moller, V. 2002. *Use of Indigeneous and indigenized medicines to enhance personal well-being a South African case study*. Social science & medicine . vol 754.[o] available: <http://www.Sciencedirect.com/science? - 06= article> :Accessed on 9/29/2005
- <http://www.moonwiseherbs.com/sustainability.htm> :Accessed on 2010/03/25
- Cunningham, A.B, Mbenkum F.T (1993). Sustainability of harvesting prunus Africana barks in Cameroon- a medical plants in international trade. A WWF\Kew\UNESCO people and plants programme Working. P.2
- De Vos, A.S. Strydom H. Fouche, C,B & Delport C,S,L. 2002. Research at Grass Roots: Pretoria: Van Schaik.
- Dold, A,P & Cocks, M.L. 2002. *The Trade in Medicinal Plants in the Eastern Cape Province, South Africa*. South African Journal of Science 98, November / December 2002.

Garbers, J.F. 1996. Research Technique: Cape Town: Juta & Co.

Giday, K.G., Wasescha, M & Bork, P. 2003. *Medicinal plant used by indigenous people* *Journal of Ethnopharmacology*. Vol 83, [o]. Available:

http://www.sciencedirect.com/science?_06=article_url&-asset

Grierson, D.S & Aflayan, A.J, 1999, *Antibacterial activity of some indigenous plants used for the treatment of wounds in the Eastern cape, South Africa*. *Journal of Ethnopharmacology*. VI 66.[o]. Available

http://www.sciencedirect.com/science?_06=article_url&-asset

Grinnell, J. 1988. Social Work Research and Evaluation, 3rd Edition: USA: Peacock.

Guidelines for the process of declaration of Protected Areas in South Africa , 2009, Criteria for the declaration of Protected Areas in South Africa. Pretoria: Government printers

Gwin, R.P. Norton, P.B & Mchenry, R. 1993. The new Encyclopedia Britannica. Volume 3. USA: Library of congress catalogue

http://www.sciencedirect.com/science?_06=article_url&-asset

Joshi, J.K. & Josh, C. 2002. "Indigenous Knowledge System for Treatment of Trypanosomiasis in Kaduna State of Nigeria". Ireland: Elsevier Science.

Keiper, D & Bodeker, G. (Eds) 1996. *The GIFTS of health reports. A special issue of the journal of alternative and complementing medicine*, 2,3, 319-458.

Lawes, C.B, Todd J, Ndou K.R & Williams P.R 2004. Indigenous medicinal plant and their use Pretoria: Juta & co

Mabogo D.E.N, 1990, The Ethnobotany of the vhavenda. RSA (MSC Thesis): University of Pretoria

Mabudafhasi R, 2006. "Second people and parks workshop": DEAT, Limpopo

Mia, M.D. & Chowdhury D, 2003. *Indigenous healthcare practice through medicinal plants from forests by the MRO tribe in Bandarban region, Bangladesh*. Indilinga-African journal of indigenous knowledge systems.vol2(2)

Masoga, M & Musyoki, A. 2001. Building on the Indigenous – An African Perspective: Thohoyandou: University of Venda.

Meyer J.J.M, Hussein AA & Tshikalange T.E. 2005, Antimicrobial activity, toxicity and the isolation of a bioactive compound from plants used to treat sexuality transmitted diseases. Journal of Ethnopharmacology [O] Available

<http://www.sciencedirect.com/science?-o6=article url&aset>

National Environment Management Act No 107 of 1998, Pretoria: Government printers

National Environmental Management: Protected Areas Act No 57 of 2003 Pretoria: Government printers

Netshiombo, K.F. 1997. The relevance of traditional healing in the treatment of mental disorder in Venda,(MSW Thesis) Medunsa. Pretoria

Nickel P.T & Sennhauser C. 1995. "Medicinal plants and traditional healers". U.S: Library catalogue

Shackleton, J.C, Moller,V & Sticher, O, 2002. *Yucatec Mayan medicinal plants: evaluation based on indigineous use*. Journal of Ethnopharmacology. Vol79.[O] Available

<http://www.sciencedirect.com/science?-06=article url& -asset>

Taylor ,L. 2004. The healing power of rainforest Herbs. Garden city: New York

Tchamou, J, 2010. *Methodology for Planning sustainable management of medicinal plants*. Journal of Ethnopharmacology. Vol 48.[o] Available <http://www.Sciencedirect.com/science?-06=article url & -aset>

Thrings T.S.A& Weitz F.M. 2005. *Medicinal plants use in the Bredasdorp/Elim region of the Southern Overberg in the Western Cape Province of South Africa*. Journal of Ethnopharmacology.[O] Available

<http://www.sciencedirect.com/science?06=article url& -aset>

Timmermans, K. 2003. "Intellectual Property Rights and Traditional Medicine: Policy Dilemmas as the Interface": Indonesia: Jakarta.

<http://www.sciencedirect.com/science?06=article url& -aset>

Tshisikhawe, M.P. 2002. Trade of indigeneous medicinal plants in the Northern Province, Venda region: (MSC Thesis) RSA: Thohoyandou

Vermeulen, L.M. 1998. Research Orientation: A Practical Study Guide for Students and Researchers: Vanderbijlpark: Potchefstroomse University.

Welman, J.C. & Kruger S,J. 2002. Research Methodology for the Business and Administrative Science, 2nd Edition: South Africa: Oxford University Press.

White,C.J.2002. Research methods and techniques. Distance learning :Pretoria

White Paper on Environmental Management Policy.1997 Pretoria. Government Printers.

APPENDIX A

Ethical consideration

Ethical consideration is the moral behaviour of the investigation of the social research. This is the standard way in which the investigation of the researches deal with beliefs of the population about what is right or wrong, good or bad. Strydom in White (2000) indicated that , ethics is a set of moral principles which are suggested by an individual or groups, is subsequently widely accepted, and which offers rules and behavioural expectations about the most correct conduct towards experimental subjects and respondents , employers, sponsors, and other researchers, assistants and students.

White (2000) indicates that, ethics generally are considered to deal with beliefs about what is right or wrong, proper or improper, good or bad. He (2002) further indicates that the researcher is responsible for the ethical standards to which the study adheres.

This study has confined itself to the following aspects of ethical considerations:

Harm to respondents

The researcher did not use the words and questionnaires that evoke and remind the respondents about their negative experience in their lives or family lives. To avoid harm and withdrawal of the respondents from the investigation of the study, words and questions that welcome the respondents have been used.

Confidentiality and privacy

Respondents have been assured that the information they contribute will be kept. Confidential and private and disclosure will be with their permission.

Perception of respondents

Only information received from the respondents has been interpreted in the report as it was without exaggeration or misrepresentation to make people believe what is not true.

APPENDIX B

QUESTIONNAIRES

Purpose of the questionnaire

A questionnaire is the access of information from the participants pertaining to their perception or views with regard to the utilization and sustainability of the indigenous medicinal plants. The respondents have reassured that they have to answer the questions honestly and reflect their own feeling and not what they think is correct to please the interviewers. They have also assured the researcher that their response will be used for the research only and will be kept and treated as strictly confidential.

Introduction

As a tool used by the researcher to collect data, questionnaires will take the form of interviews. In the process during data collection, questionnaires will avoid ambiguous questions that could confuse the participants. In order to serve the purpose of searching relevant information from the participants, the questionnaires will be framed in a simple and understandable language. Questions such as those requesting the names of the participants will be avoided as they could jeopardize the chance of getting more and reliable information. Questionnaires will be coded into two groups: those that are concerned with the perception or views of the local community members towards medicinal plants and those that are concerned with the roles of the local communities.

A. Personal information

1. Marital status

| | |
|---------|--|
| Married | |
| Single | |

Official
Coding

1

2. Occupation: employed, unemployed or self employed

| | |
|---------------|--|
| Employed | |
| Unemployed | |
| Self employed | |

2

3. Generation: elderly and youth

In which generation do you fall?

| | |
|---------|--|
| Elderly | |
| Youth | |

3

4. Status: position in the community

Traditional healer, chief, headman

| | |
|--------------------|--|
| Traditional healer | |
| Chief | |
| Headman | |

4

5. Gender

| | |
|--------|--|
| Male | |
| Female | |

-
5

6. In which village do you and your family live?

6

| | |
|----------------|----------------------|
| Vuvha | <input type="text"/> |
| Tshidongololwe | <input type="text"/> |
| Tshithuthuni | <input type="text"/> |
| Mafukani | <input type="text"/> |
| Thengwe | <input type="text"/> |

7. What age do you falls under?

| |
|--------------|
| 25-31 |
| 32-38 |
| 39-45 |
| 46-52 |
| 53 and above |

7

8. By which dilect group is the area of Thengwe mostly characterized ?
e.g. Vhatavhatsindi, Vhailafuri, Vhapani, Vhambedzi etc

| | |
|----------------|--|
| Vhatavhatsindi | |
| Vhailafuri | |
| Vhapani | |
| Vhambedzi | |
| others | |

8

Local people`s perception on indigenous medicinal plants.

9. How many medicinal plants do you know within this area, and how do people perceive these medicinal plants?

9

10. Will you mention at least ten names of the indigenous medicinal Plants that you know?

10

| | |
|-----|--|
| (a) | |
| (b) | |
| (c) | |
| (d) | |
| (e) | |
| (f) | |
| (g) | |
| (h) | |
| (i) | |
| (j) | |

11. Do you think indigenous medicinal plants are important in your life?

21

| | |
|-----|--|
| Yes | |
| No | |

22

11.1. If yes, give the reason.

23

11.2. Do you ever use some medicinal plants for your health, answer the following questions below

24

12. In which diseases do you commonly use this medicinal plant?

13. Do the indigenous medicinal plants play a pivotal role in the health of the local people or communities?

25

| | |
|-----|--|
| Yes | |
| No | |

13.1. If yes, what do you think are the main critical role played by these medicinal plants?

26

14. Will you please explain how they cure some of the diseases?

27

15. Which diseases are considered very deadly and yet can be treated with the indigenous medicinal plants found in the area?

28

16. Which indigenous medicinal plants are used to treat those diseases?

29

| Medicinal plants | Diseases treated | Preparation | Dosage |
|------------------|------------------|-------------|--------|
| | | | |
| | | | |
| | | | |

17. Which are the most dominant indigenous medicinal plant(s) used to treat the above-mentioned diseases, elaborate?

30

18. Are there any roles played by indigenous medicinal plants in alleviating Poverty within the community?

31

| | |
|-----|--|
| Yes | |
| No | |

18.1. If yes mention those roles and explain how such medicinal plants can alleviate poverty within the community?

32

19. What are the main economic factors contributing to overharvesting of medicinal plants in the Thengwe village?

33

20. What do you think are the social values of the indigenous medicinal plants?

34

21. Are there any natural eathestatical values the indigenous medicinal plants have?

35

| | |
|-----|--|
| Yes | |
| No | |

21.1. If yes give a reason (s)

36

22. Do the indigenous medicinal plants have role in cultural activities of the local communities?

37

| | |
|-----|--|
| Yes | |
| No | |

22.1. If yes, what kind of activities do they perform?

38

23. Do indigenous medicinal plants create employment opportunities for the local people?

39

| | |
|-----|--|
| Yes | |
| No | |

23.1. If yes, explain

40

Role of local people in the sustainability of indigenous medicinal plants

24. Are the indigenous medicinal plants used in a way that can last long?

41

| | |
|-----|--|
| Yes | |
| No | |

42

24.1. Is there any thing done by the local people to care for the medicinal plants?

24.2. If yes, which strategies are used to minimize the threats imposed on the

Indigenous medicinal plants?

25. What are the roles of the municipality with regard to the sustainability of the

Indigenous medicinal plants?

43

26. Does the legislature assist the local people with rules to avoid the curtail destruction of the indigenous medicinal plants?

44

| | |
|-----|--|
| Yes | |
| No | |

26.1. If yes, what are the rules used to make them last long?

45

Challenges faced by the local people in sustaining medicinal plants

27. Are there any challenges that people encounter in sustaining medicinal plants?

46

| | |
|-----|--|
| Yes | |
| No | |

27.1. If yes, what are those challenges?

28. What impact do they have on the medicinal plants?

47

29. Do people monitor these medicinal species?

48

| | |
|-----|--|
| Yes | |
| No | |

29.1. If yes, how do they monitor them?

APPENDIX C

CONSISTENCY METRIX

| Sub-problem | Research Questions | Source of theory | Source of Data | Type of data |
|-------------|--|---|----------------|--------------|
| | Do the indigenous medicinal plants play a critical role in the local people | Mia and Chowdhury(2003) Grieson and Afolayan(1999) Thiring and Wetz(2005) Mabogo(1990) Lawes et al(2004) Tshisikhawe(2002) | | |
| | What are the main economic factors contributing to overharvesting of medicinal plants in the Thengwe village | Cunningham et al (1993) Nickel and Sennhauser(1995) Dold and Cocks(2002) Lawes et al(2004) Mabogo(1990) | | |
| | Do the indigenous medicinal plants have a role in cultural activities of the | Shackleton et al (2002) Mabogo (1990) | | |

| | | | | |
|--|---|--|--|--|
| | local people? | Cocks and Moller(2002) Giday et al(2003) Joshi and Joshi(2000) | | |
| | Are there any intergovernmental policies in place which regulate overharvesting of the medicinal plants | Bedeker (2005) Lawes et al (2004) | | |
| | What strategies are implemented in order to minimize the threats imposed on the indigenous medicinal plants | Lawes et al (2004) NEMA No:107(1998) White paper on Environmental management policy (1997) | | |
| | | | | |

APPENDIX C: Map of the Study Area

